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# Reports

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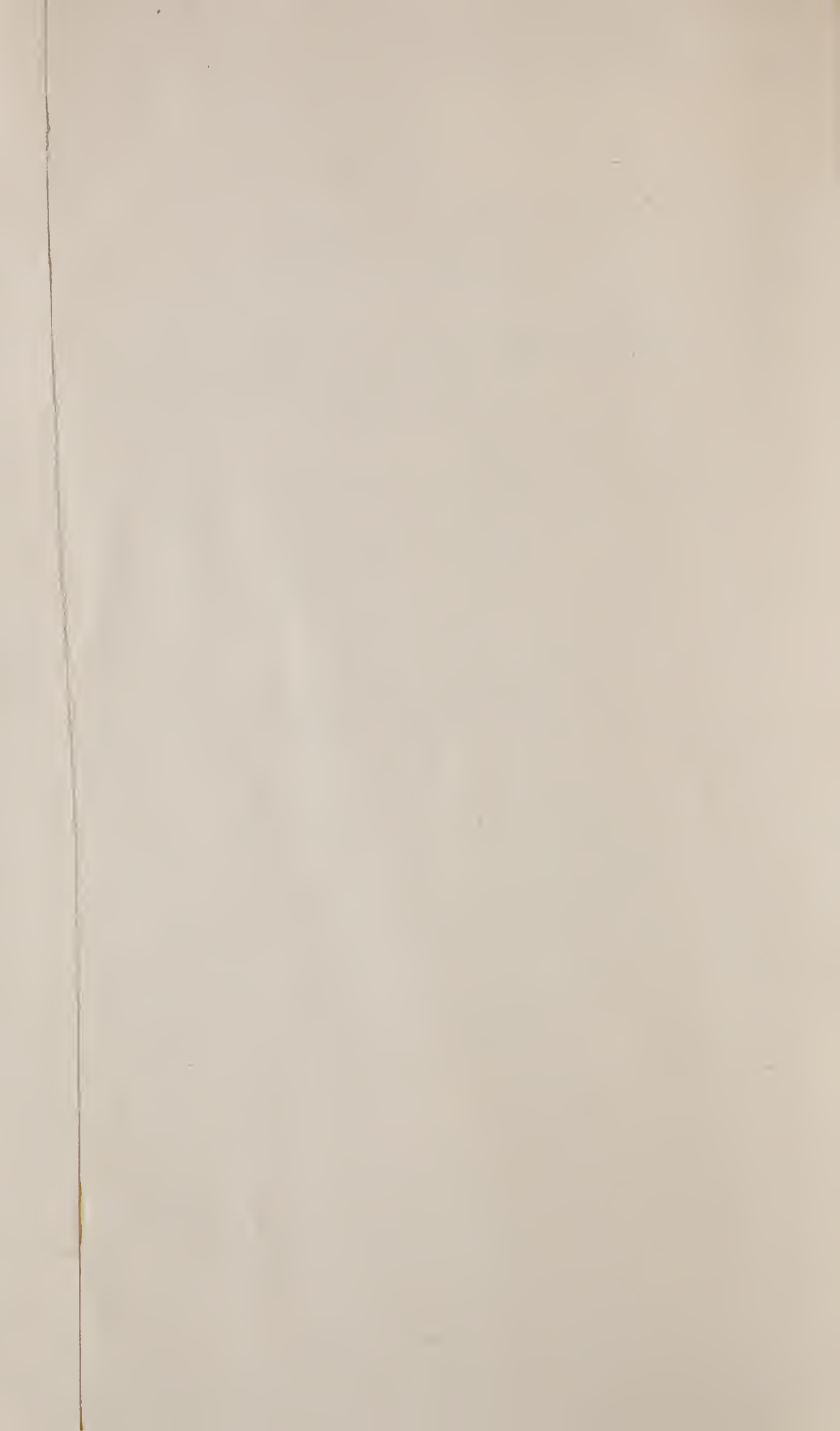
— of the —

— State Engineer —

( J. S. GREENE )

— for —

1887, 1888



FOURTH BIENNIAL REPORT

OF THE

# STATE ENGINEER

TO THE

Governor of Colorado,

FOR THE

YEARS 1887 AND 1888.

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PART I.

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DENVER, COLO.:

THE COLLIER & CLFAVELAND LITHOGRAPHING CO., STATE PRINTERS.

1889.

1887-1888



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## LETTER OF TRANSMITTAL.

DENVER, COLORADO, December 1, 1888.

*Governor:*

I have the honor to transmit herewith, in Parts I. and II., the report of the transactions of the Department of the State Engineer, for the two fiscal years ending November 30, 1888.

I am, sir, respectfully,

Your obedient servant,

J. S. GREENE,

*State Engineer.*

*To His Excellency,*

ALVA ADAMS,

*Governor of Colorado.*



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## PREFACE.

A brief reference to the physical features of Colorado, to her rapid development in irrigation matters, and to the *governing doctrine* in her irrigation laws, may be a not improper preface to this report.

Situated on both sides of the Continental Divide, and including many ranges of a secondary order, Colorado presents a most diversified surface of mountains, plains, and valley lands, aggregating in area some 66,560,000 acres; not five *per centum* of which is void of vegetation, and more than half of which will, in return for the quickening qualities of water, yield the most abundant harvests.

To secure this water, Colorado rears the summits of her mountains to the clouds, and solicits and receives therefrom the rain and snow from which she feeds the great rivers, which, grouping their sources in the center of her boundaries, course thence to the north and south, the east and west, inviting in every direction that union with the soil which it is the province of man to effect and profit by. In the early territorial days it was the Mexican population of the south which purchased from the thirsty soil its birth-right for a little water. This water was conveyed to the land in small channels, irregular in section, fall and alignment. These channels were seldom carried above the highest level of the low bottom lands immediately adjoining the streams, and usually wound around the toe of the slope of the high adjacent lands. From these humble constructions, with but a few square feet of cross-section, step by step, with the advent into the State of each increment of energy, skilled labor and wealth, Colorado has seen her irrigat-

ing canals multiply in numbers, and with more and more perfection of construction, develop into great channels, some of which carry a body of water seventy feet wide and six feet deep, far out onto the rich mesa lands.

Since that period when the pioneers found within the confines of Colorado, but a few miles of irrigating ditches, and, at the most, but several thousand acres of cultivated lands, three decades are drawing to a close; but such has been the progress of irrigation development in the State during that period, that water in four thousand miles of ditches, holding sway over two millions of acres of lands, is accounted to its credit.

That energy which has accomplished so much seems undiminished in strength and purpose, and to aim at no less an achievement than the economic use of all of the waters of the State in the irrigation of lands. How much land can then be irrigated? is an unsolved problem. There enter into the consideration thereof so many unknown quantities and variable functions, that it is carried beyond the sphere of calculation. The only solution of the problem would seem to be a practical one; yet year by year, as irrigation statistics are gathered and assimilated, the estimates of the area of land which can eventually be brought under cultivation will the more nearly approach the truth. As perhaps of interest in themselves, as well as indicative that the supply of water in Colorado is sufficient, if made to supplement properly the rain-fall, to bring under cultivation no inconsiderable portion of the lands of the State, the following facts are presented; prefaced by the statement, however, that though drawn from the best sources of information attainable, they can only, with one or two exceptions, be considered as close approximations to the truth, and are only called facts by courtesy. As the waters falling west of the Continental Divide can not,



to any considerable extent, be brought to the east thereof, the portions of the State separated by the Divide, offer separate problems for consideration.

On the *west of the Continental Divide* it is found:

That the area of mountain lands is . . . . .	16,360,000 acres
That the mean annual precipitation over that area is . . . . .	33 inches
That the area of plateaus and rolling and valley lands is . . . . .	9,400,000 acres
That the mean annual precipitation over that area is . . . . .	10.70 inches
That the total area is . . . . .	25,760,000 acres
That the mean annual precipitation would average for that area . .	25 inches

On the *east of the Continental Divide* it is found:

That the area of mountain lands is . . . . .	10,200,000 acres
That the mean annual precipitation over that area is . . . . .	30 inches
That the area of plains and rolling and valley lands is . . . . .	30,600,000 acres
That the mean annual precipitation over that area is . . . . .	15 inches
That the total area is . . . . .	40,800,000 acres
That the mean annual precipitation would average for that area .	18.7 inches

Let it be considered in connection with the areas east of the Continental Divide, and with the precipitation thereover, that the limit of remunerative farming, without irrigation, is drawn at an annual precipitation of twenty-two inches; that the quantity of water passing through the cañon of the Cache la Poudre river, as measured by this department in the year 1884, was equivalent to a precipitation of 13.367 inches over the entire water-shed of that stream above its cañon; that the total precipitation over that water-shed, though not exactly known for that year, was about 33.4 inches; that about forty *per centum*, then, of the snow and rain-fall over the water-shed of the Cache la Poudre river above the cañon, flowed through the cañon of that stream and was available for irrigation direct or for storage for irrigation; that the application of this deduction to the precipitation over the entire area of the mountain lands east of the Continental Divide would indicate that about forty *per centum* of the mean annual precipitation over that area would be the portion available for supplementing the rain and snow-fall on the irrigable lands east of the Divide, and that this would, if

it could all be utilized and evenly distributed, afford with the rainfall a mean annual depth of water of twenty-seven inches over 10,200,000 acres of plains and valley land.

But it is evident on the one hand, that the water of the streams could not, by reason of the contour of the country, be quite equally distributed; that a considerable portion of the water drawn from the streams for direct irrigation, as well as that stored in reservoirs, is lost by evaporation and seepage before it is placed upon the land, while a portion of the water in the streams themselves is by the same causes dissipated. On the other hand, it should be borne in mind that much of the water drawn from the streams near their sources, or cañons, and carried in ditches and distributed to the land, returns to the stream directly, or by percolation, and can be drawn therefrom again by ditches diverting water below, and thus portions of the water of a stream be used for irrigation several, perhaps many times; that much of the observed loss in reservoirs, through seepage, returns to the water courses and may be diverted therefrom; that while the annual rainfall estimated as necessary to the profitable raising of crops without irrigation, falls at haphazard times, irrigation works enable the cultivator of the soil to apply water to his crops at the times when they most need it; that less water, on some lands and with some crops at any rate, is needed for irrigation after the first few years of application of water thereto, and that the rain-fall on that belt of the plains near the base of the mountains furnishes some water to the streams, not accounted for in their estimated discharge at their cañons, which can be used on the lower lands to the east.

These considerations are not repeated in connection with the western portion of Colorado. A glance at the statements given and relating to that portion of the State

indicates that the ratio of mountains to plateau and valley lands is much greater there than is the case east of the Divide, and that the water supply there, notwithstanding the light rain-fall on the plateaus and in the valleys is greater, both actually and in proportion to the needs therefor, than in the eastern portion of Colorado. While this brief review of the natural conditions governing irrigation development in Colorado shows that any attempt to foretell accurately the area of the land in the State which may be brought under irrigation must be fruitless, a conclusion rendered more apparent when it is recognized that the annual precipitation, both in the mountains and on the plains, varies greatly; it, nevertheless, plainly supports the confidence that the achievement aimed at by her people will make of Colorado a great agricultural commonwealth.

But, however energetic her people may have been, however skillful in construction and fruitful in resources, it was in the legislative halls and the court rooms that they fostered best Colorado's wonderful development in irrigation enterprises. This is not to be considered, however, as indicating that the irrigating laws of the State are by any means perfect, or complete, or that the actions of the courts have been universally satisfactory. Indeed, more matters of importance in connection with this art of irrigation are now demanding attention at the hands of the law makers of Colorado than has been the case at any previous period. But the demand is now for a systematic arrangement of the laws, the extension thereof, and the modification of those enactments which are not clearly consistent with the fundamental doctrines of the courts governing the use of water for irrigation in the State. While the English common law, so far as applicable and of a general nature, was incorporated, subject to repeal by legislative authority, into the laws of the State, both the courts and the legislature have

made such encroachments upon it that but slight trace of it, in its bearings upon the use of water, here remains. The reason for this result is found in the fact that the common law theory of riparian rights, whereby only those holding lands bordering on natural streams have the right to the use of the waters thereof, and they only to the extent possible under the necessity of returning the water to the stream before it has left their lands, and unimpaired in quantity and quality, was totally inapplicable to the requirements of those communities living in what is known as the arid regions. It was probably in the necessities of the placer miners on the public domain that the foundation of the theory *that rights in water can be gained by priority of appropriations thereof to beneficial uses* rests. The right of the pre-emption of the waters of the natural streams of the public domain has been recognized by Congress. The defining of these rights, and the provisions for securing them, are found in the legislative enactments and judicial decisions of the States and Territories, where irrigation and mining are practiced.

The Supreme Court of this State has held:\* "That the first appropriator of the water of a natural stream has a prior right, to the extent of his appropriation, is a doctrine that we must hold applicable in all cases respecting the diversion of water for the purpose of irrigation." The doctrine thus clearly set forth, which is also recognized in the Constitution of the State, has not, by reason of the failure of the legislature to embody it more completely in the enactments concerning the adjudication of water rights, been of that service to irrigation development that it might have been. This failure seems to have been occasioned by a too limited conception of the meaning of the word "appropriation,"

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\*See work by Mr. S. W. Carpenter, entitled "The Law of Water for Irrigation in Colorado."



whereby more stress was laid upon the *diversion* than upon the utilization of the waters of the State.

Decrees of the District courts set forth the dates and amounts of the appropriations of water, in conformity to this doctrine, so far as the legislative enactments concerning the adjudication of water rights, and governing the courts in this matter, permit. These decrees afford to the department of the State Engineer that information which is necessary to enable the department to distribute the waters of the streams to the various canals and reservoirs, in accordance with their rights to water. The more intimate relations between the laws, the decrees and the regulations and acts of this department will appear in the body of this report.

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## CHAPTER I.

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### **History of Operations of the Department for the Years 1887-88.**

---

On entering upon the duties of the office of State Engineer, April 19, 1887, it readily became apparent, from the numerous letters of inquiry received from water commissioners and others, relative to the irrigation laws, that serious complications connected with the distribution of water from the natural streams might be avoided by gathering from the General Statutes and Session Laws, and issuing in compact form those portions of the law with which water commissioners and superintendents of irrigation were directly concerned; by accompanying the same with remarks explanatory of those sections of the law occasioning the most frequent letters of inquiry, and with instructions tending to secure uniformity of action on the part of superintendents and commissioners in the performance of their

duties, and by distributing the same as occasion demanded. Accordingly, on June 1, 1887, an edition of five hundred pamphlets were issued, of which the following is a copy:

# LAWS AND REGULATIONS

RELATIVE TO THE

## DISTRIBUTION OF WATER IN COLORADO,

BY

Superintendents of Irrigation and Water Commissioners.

---

ISSUED FROM THE STATE ENGINEER'S OFFICE,

DENVER, COLORADO, JUNE 1, 1887.

---

### INTRODUCTORY LETTER.

*To Superintendents of Irrigation and Water Commissioners in the State of Colorado:*

GENTLEMEN:

Under and by virtue of various acts of the Legislature of Colorado, the offices we fill have been created and our duties defined. The execution of important laws governing the distribution of water for irrigation is entrusted to us. A perfect knowledge of these laws is necessary to the effective execution of them. The general impression that the irrigation laws of Colorado form a tangled web impossible to unravel, is, in my opinion, without foundation, as is also the prevailing belief that a water commissioner cannot perform the duties required of him. With this last opinion you will, I have no doubt, agree, upon due consideration of the laws directly relating to the distribution of water from

natural streams, which herein follow, and which are published in this concise form that you may the more readily familiarize yourselves with them.

But a knowledge of the laws, however perfect, is not the only qualification necessary to the complete performance of your duty. You are connected with a department of State work which I am sure you will recognize as most intimately related to the general welfare. A recognition of the importance of this work will, if I am not mistaken, be followed by a patriotic effort on your part to forward in every way possible the development of irrigation in your districts. This will demand from you self-control, forbearance under criticism, and such an interest in the progress of irrigation as will lead you to familiarize yourself with the subject in both its legal and practical aspects, thereby enabling you to urge with effect upon the ditch and reservoir owners in your districts the duty and advisability of complying with the various laws governing the adjudication of their priorities and the measurement of their ditches. But, however well qualified and willing to perform their duties the various individuals connected with this department may be, the amount of work to be done, and the necessity for prompt communication and concerted action, growing out of our mutual dependence upon each other, are such, that a systematic organization of this department is essential to its successful operation. Upon me falls the general supervision in this matter, and acting as such general supervisor, I have issued such regulations as hereinafter appear. If I find upon trial that any of them are undesirable, and that others are required, changes or additions will be made, of which you will be duly notified.



Constitution of Colorado, Art. XVI.

*Sec. 5. Water Public Property.]*

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 is dedicated to the use of the people of the State, subject to appropriation, as hereinafter provided.

*Sec. 6. Diverting Unappropriated Water—Priority.]*

The right to divert unappropriated waters of every natural stream for beneficial uses 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 the preference over those using the same for manufacturing purposes.

*G. S. 1729. Vested Rights of Mill and Ditch Owners.]*

Nothing in this chapter contained shall be so construed as to impair the prior vested rights of any mill or ditch owner or other person to use the water of any such water course. [Sec. 1379 (8), p. 516, G. L.—Sec. 8, p. 364, R. S.—Same in substance as Sec. 10, p. 69, acts 1861.

“Chapter” in this section refers to chapter LVII. of the General Statutes, entitled “Irrigation.”

This section is not interpreted to mean that owners of irrigating ditches, however early their appropriation of water may have been, are not subject to the laws of the State governing the adjudication of priorities, for thereby their rights are only the more strongly affirmed.

PRIORITY OF APPROPRIATION OF WATER FOR IRRIGATING PURPOSES.

*G. S. 1762. Jurisdiction of Courts—How Vested.]*

For the purpose of hearing, adjudicating and settling all questions concerning the priority of appropriation of

water between ditch companies and other owners of ditches drawing water for irrigation purposes from the same stream or its tributaries within the same water district, and all other questions of law and questions of right, growing out of or in any way involved or connected therewith, jurisdiction is hereby vested exclusively in the District court of the proper county; but when any water district shall extend into two or more counties, the District court of the county in which the first regular term after the first day of December in each year shall soonest occur, according to the law then in force, shall be the proper court in which the proceedings for said purpose, as hereinafter provided for, shall be commenced; but where said proceedings shall be once commenced, by the entry of an order appointing a referee in the manner and for the purpose hereinafter in this act provided, such court shall thereafter retain exclusive jurisdiction of the whole subject until final adjudication thereof is had, notwithstanding any law to the contrary now in force. [Sec. 19, pp. 99-100, acts 1879.

From this section it is evident that no question concerning the priority to the use of water between the different ditch owners using water for irrigation, is to be decided by the water commissioners or superintendents of irrigation, though a general impression to the contrary prevails.

1720. *New Ditches—Sworn Statements Must be Filed—Contents—Maps.*]

SEC. 10. (2) Every person, association or corporation hereafter constructing or enlarging any ditch, canal or feeder for any reservoir, for irrigation, and taking water directly from any natural stream, and of a carrying capacity of one cubic foot per second of time as so constructed or enlarged, shall, within ninety days after the commencement of such construction or enlargement, file and cause to be recorded in the office of the county clerk of the county in which such ditch, canal or feeder may be situated, or if such canal, ditch or feeder be situated in any water district, in the office of the county clerk of such county into which such water dis-

trict may extend, a sworn statement in writing, showing the name of such ditch, canal, or of the reservoir supplied by such feeder, the point at which the head-gate thereof is situated (if it be a new construction), the size of the ditch, canal or feeder, in width or depth, and the carrying capacity thereof in cubic feet per second, the description of the line thereof, and the time when the work was commenced, and the name or names of the owner or owners thereof, together with a map showing the route thereof, the legal subdivision of the land, if on surveyed lands, with the proper corners and distances, and in the case of an enlargement, the depth and width, also the carrying capacity of the ditch enlarged, with the width and depth of the ditch, canal or feeder as enlarged, and the increased carrying capacity of the same thereby occasioned, and the time when such enlargement was commenced, and no priority of right for any purpose shall attach to any such construction or enlargement until such record is made. [Sec. 2, p. 162, acts 1881.

#### PRIORITIES—MAP AND STATEMENT.

[S. B. No. 309.]

AN ACT to amend section two of an act of the General Assembly of the State of Colorado, entitled "An act to provide for the extension of the right of way for ditches, canals and feeders of reservoirs in certain cases, and requiring registration of all such hereafter made or enlarged," approved February 11, 1881, being general section No. 1720 of the General Statutes of the State of Colorado, which is section 10, of chapter LVII., of said General Statutes, entitled "Irrigation."

*Be it enacted by the General Assembly of the State of Colorado:*

SECTION 1. That section two (2) of said act, approved February 11, 1881, being general section No. 1720 of the General Statutes of the State of Colorado, which is section 10, of chapter LVII., of said General Statutes, entitled "Irrigation," be and the same is hereby amended to read as follows:

SEC. 2. Every person, association or corporation hereafter constructing or enlarging any ditch, canal, or feeder for any ditch or reservoir for irrigation, and taking water directly from any natural stream, and of a carrying capacity of more than one cubic foot of water per second of time, as so constructed or enlarged, shall, within ninety (90) days after the commencement of such construction or enlargement, file in the office of the county clerk and recorder of the county in which the head-gate of such ditch or feeder may be situated, and also in the office of the State Hydraulic Engineer, a map showing the point of location of such head-gate, the route of such ditch or canal, or the high-water line of such reservoir or reservoirs, and the route of the feeder to, and ditches or canals from, such reservoir or reservoirs; the legal subdivisions of the lands upon which such structures are built, or to be built, if on surveyed lands; the names of the owners of such lands, as far as the same are of record in the office of the county clerk of the county in which they are situated; such courses, distances and corners, by reference to legal subdivisions, if on surveyed lands, or to natural objects, if on unsurveyed lands, as will clearly designate the location of such structures. Upon or attached to such map shall be a statement showing:

*First*—The point of location of the head-gate above mentioned.

*Second*—The depth, width and grade of such ditch, canal or feeder.

*Third*—The carrying capacity of such ditch, canal or feeder, in cubic feet per second of time, and the capacity of such reservoir or reservoirs in cubic feet when filled to the high-water mark.

*Fourth*—The time of commencement of work on such structures, which time may be dated from the commencement of the surveys thereof. In case of an enlargement, such statement shall also show the matters required in items second, third and fourth above, as to the enlargement, and state the increased capacity arising from such enlargement. If such statement be filed within the time above limited, priority of right of way and water accordingly shall date from the day named as the day of commencing work; otherwise, only from the



date of the filing of the same; *Provided*, That nothing herein contained shall be taken to dispense with the necessity of due diligence in the prosecution of such structures on the part of the projectors of the same. Such statement shall be signed by the person, association or corporation on whose behalf it is made, and the truth of the matters shown in such map and statement shall be sworn to by some person in whose personal knowledge the truth of the same shall lie.

Approved April 20, 1887. In force July 19, 1887.

Attention is called to this late enactment of the General Assembly, because through records made under its provisions, as has been done under those of that section of the General Statutes which it amends, claims may be made that the water commissioners must distribute the water from the natural streams in accordance with the priority thereunder claimed, and the capacity of the ditch thereunder set forth. Such an interpretation I regard as unwarranted. Priority of right of way and water accordingly may be thereunder acquired; though by failure to prosecute the work with due diligence, an apparent priority may be lost. A claim to an amount of water may be made which subsequently the court may refuse to approve. It is the prerogative of the District courts to settle these questions, not of the water commissioners. The latter can not have the requisite information to enable them to allot water from the natural streams into any ditch in times of scarcity, until a decree of the District court adjudicating the same has been issued.

## ESTABLISHMENT OF PRIORITIES.

### PROCEEDINGS IN COURT.

*G. S. 1766. Moving Court to Proceed—Order—Evidence—Examination—Proof—What Facts—Decree—Certificate of Clerk.]*

When, at any time after the first day of June, A. D. 1881, any one or more persons, associations or corpora-

tions, interested as owners of any ditch, canal or reservoir in any water district, shall present to the District court of any county having jurisdiction of priority of rights to the use of water for irrigation in such water district according to the provisions of (sec. 19, G. S., 1762) an act entitled an act to regulate the use of water for irrigation and providing for settling the priority of rights thereto, and for payment of the expenses thereof, and for payment of all costs and expenses incident to said regulation of use, or to the judge thereof, in vacation, a motion, petition or application in writing, moving or praying said court to proceed to an adjudication of the priorities of rights to use of water for irrigation between the several ditches, canals and reservoirs in such districts, the court or judge thereof in vacation, shall without unnecessary delay, in case he shall deem it practicable to proceed in open court, as prayed for, by an order to be entered of record upon such motion, petition or application, appoint a day in some regular or special term of said court, for commencing to hear and take evidence in such adjudication, at which time it shall be the duty of the court to proceed to hear all evidence which may be offered by or on behalf of any person, association or corporation, interested in any ditch, canal or reservoir, in such district, either as owner or consumer of water therefrom, in support of or against any claim or claims of priority of appropriation of water made by means of any ditch, canal or reservoir, or by any enlargement or extension thereof in such district, and consider all such evidence, together with any and all evidence, if any, which may have been heretofore offered and taken in such district, in the same manner by any referee heretofore appointed under the provisions of said act above herein mentioned, and also the arguments of parties or their counsel, and shall ascertain and find from such evidence, as near as may be, the date of the commencement of such ditch, canal or reservoir, together with the original size and carrying capacity thereof, as originally constructed, the time of the commencement of each enlargement or extension thereof, if any, with the increased capacity thereby occasioned, the time spent, severally in such construction and enlargement or extension and re-enlargement, if any, the diligence with

which the work was in each case prosecuted, the nature of the work as to difficulty of construction, and all such other facts as may tend to show the compliance with the law, in acquiring the priority of right claimed for each such ditch, canal or reservoir, and determine the matters put in evidence, and make and cause to be entered a decree determining and establishing the several priorities of right, by appropriation of water of the several ditches, canals and reservoirs in such water district, concerning which testimony shall have been offered, each according to the time of its said construction and enlargement, or enlargements or extensions, with the amount of water which shall be held to have been appropriated by such construction and enlargements, or extensions, describing such amount by cubic feet per second of time, if the evidence shall show sufficient data to ascertain such cubic feet, and if not, by width, depth and grade, and such other descriptions as will most certainly and conveniently show the amount of water intended as the capacity of such ditch, canal or reservoir, in such decree. Said court shall further order that each and every party interested in, or claiming any such ditch, canal or reservoir, shall receive from the clerk, on payment of a reasonable fee therefor, to be fixed by the court, a certificate, under seal of the court, showing the date or dates and amount or amounts of apportionments adjudged in favor of such ditch, canal or reservoir, under and by virtue of the construction, extension and enlargements thereof, severally; also specifying the number of said ditch and of each priority to which the same may be entitled by reason of such construction, extension and enlargements. [Sec. 4, pp. 144-5-6, acts 1881.

G. S. 1766 shows the authority for the certificate from the clerk of the District court, which latter becomes the warrant of authority to said water commissioners for regulating the flow of water from the streams.

#### DECREE.

*G. S. 1771. Court Number all Ditches—Reservoirs—Number Appropriations.]*

The court in making such decree, as aforesaid, shall number the several ditches and canals in the water dis-

trict, concerning which adjudication is made, in consecutive order, according to priority of appropriation of water thereby made by the original construction thereof, as near as may be, having reference to the date of each decree as rendered, and shall also number the reservoirs in like manner, separately from ditches and canals, and shall further number each several appropriation of water consecutively, beginning with the oldest appropriation, without respect to the ditches or reservoirs by means of which such appropriations were made; whether such appropriations shall have been made by means of construction, extension or enlargement, which number of each ditch, canal or reservoir, together with the number or numbers of any appropriations of water held to have been made by means of the construction, extension or enlargement thereof, shall be incorporated in said decree and certificate of the clerk, to be issued to the claimants, as provided in section one of this act, so as to show the order in priority of such ditch or canal, and of such reservoir, and also of such successive appropriation of water pertaining thereto, for the information of the water commissioner of the district in distributing water; such numbering to be as near as may be having reference to date of decrees as rendered. [Sec. 9, p. 149, acts 1881.

#### CERTIFICATE.

*G. S. 1767. Copy of Decree—Authority of Commissioners—Recording Copy—Evidence.]*

The holder of such certificate shall exhibit the same to the water commissioner of the district when he commences the exercise of his duties, and such water commissioner shall keep a book, in which shall be entered a brief statement of the contents of such certificate, and which shall be delivered to his successor, and said certificate, or statement thereof in his book, shall be the warrant of authority to said water commissioner for regulating the flow of water in relation to such ditch, canal or reservoir. Said certificate shall be recorded, at the same rates of charges as in cases of deeds of conveyance, in the records of each county into which the ditch, canal or reservoir, to which said certificate relates, shall extend; and said certificate, or said record thereof, or a duly cer-



tified copy of such record, shall be *prima facie* evidence of so much of said decree as shall be recited therein, in any suit or proceeding in which the same may be relevant. [Sec. 5, pp. 146-7, acts 1881.

## WATER DISTRICTS.

G. S. 1741.]

The lands now irrigated, or which may be hereafter irrigated, from ditches now taking water from the following described rivers or natural streams of the State of Colo.ado, are hereby declared to constitute irrigation districts. [Sec. 5, p. 97, acts 1879.

G. S. 1742.]

District No. 1 shall consist of all lands irrigated from ditches from the South Platte river, between its intersection with the State line of Colorado and Nebraska and the mouth of the Cache la Poudre river. [S. B. No. 90, approved and in force March 8, 1887.

G. S. 1743.]

District No. 2 shall consist of land irrigated from ditches taking water from the South Platte river and its tributaries, except Big Thompson, St. Vrain and Clear creek, between the mouth of the Cache la Poudre river and the mouth of Cherry creek.

G. S. 1744.]

District No. 3 shall consist of all lands irrigated from ditches taking water from the Cache la Poudre river and its tributaries.

G. S. 1745.]

District No. 4 shall consist of all lands irrigated from ditches taking water from the Big Thompson and its tributaries.

G. S. 1746.]

District No. 5 shall consist of all lands irrigated from ditches taking water from the St. Vrain creek and its tributaries, except the Boulder, its tributaries, and Coal creek.

*G. S. 1747.]*

District No. 6 shall consist of all lands irrigated from ditches taking water from the Boulder and its tributaries, and Coal creek.

*G. S. 1748.]*

District No. 7 shall consist<sup>38</sup> of all lands irrigated from ditches taking water from Clear creek and its tributaries.

*G. S. 1749.]*

District No. 8 shall consist of all lands irrigated by ditches taking water from Cherry creek, Plum creek and Platte river, and their tributaries, except Bear creek, above District No. 2, and below the forks of the north and south branches of the South Platte river.

*G. S. 1750.]*

District No. 9 shall consist of all lands irrigated from ditches taking water from Bear creek and its tributaries.

*G. S. 1751.]*

District No. 10 shall consist of all lands irrigated from ditches taking water from the Fountain and its tributaries; *Provided*, That said district shall not extend beyond the limits of El Paso county.

*Session Laws 1885, p. 256.]*

SEC. 4. District No. 11 shall consist of all lands irrigated from ditches or canals taking water from that part of the Arkansas river lying in Chaffee county; also, all lands irrigated from ditches and canals taking water from the tributaries to the said portion of the Arkansas river.

SEC. 5. District No. 12 shall consist of all lands irrigated from ditches or canals taking water from that part of the Arkansas river lying in Fremont county; also, all lands irrigated from ditches or canals taking water from the tributaries of said portion of the Arkansas river, except Grape creek and its tributaries.

SEC. 6. District No. 13 shall consist of all lands irrigated from ditches or canals taking water from Grape creek and its tributaries.

SEC. 7. District No. 14 shall consist of all lands irrigated from ditches or canals taking water from the Arkansas river in Pueblo county; also, all lands irrigated by ditches or canals taking water from the tributaries of said Arkansas river in said county, [except] the St. Charles and its tributaries, and the Huerfano and its tributaries.

SEC. 8. District No. 15 shall consist of all lands irrigated from ditches or canals taking water from the St. Charles and its tributaries.

SEC. 9. District No. 16 shall consist of all lands irrigated from ditches and canals taking water from the Huerfano and its tributaries.

SEC. 10. District No. 17 shall consist of all lands irrigated from ditches or canals taking water from that part of the Arkansas river lying in Bent county; also, all lands irrigated from ditches or canals taking water from the tributaries of said portion of the Arkansas river, except the Apishapa and its tributaries, and the Purgatoire and its tributaries.

SEC. 11. District No. 18 shall consist of all lands irrigated from ditches and canals taking water from the Apishapa and its tributaries.

SEC. 12. District No. 19 shall consist of all lands irrigated from ditches or canals taking water from the Purgatoire and its tributaries.

District No. 20. Water Districts Nos. 20 and 23, of the State of Colorado, as heretofore established, be and the same are hereby consolidated and formed into one water district, numbered twenty, of the State of Colorado. Said Water District No. 20 shall consist of all lands within the State of Colorado irrigated from ditches or canals taking water from the Rio Grande river within said State. [S. B. No. 175, approved April 2, 1887. In force July 1, 1887.]

SEC. 14. District No. 21 shall consist of all lands irrigated from ditches or canals taking water from the Alamosa and La Jara creeks and their tributaries.

SEC. 15. District No. 22 shall consist of all lands in the State of Colorado irrigated from ditches or canals taking water from Conejos creek and its tributaries.

SEC. 17. District No. 24 shall consist of all lands irrigated from ditches or canals taking water from the Culebra creek and its tributaries, and as much of the lands as lie in the State of Colorado as are irrigated from ditches or canals taking water from the Costilla creek and its tributaries.

SEC. 18. District No. 25 shall consist of all lands irrigated from ditches or canals taking water from the San Luis creek and its tributaries.

SEC. 19. District No. 26 shall consist of all lands irrigated from ditches or canals taking water from the Saguache creek and its tributaries.

SEC. 20. District No. 27 shall consist of all lands irrigated from ditches or canals taking water from Tuttle, Carnero, La Garita and all other creeks and their tributaries which have their sources of water supply in the La Garita mountains, and flow eastward into the San Luis valley.

SEC. 21. District No. 28 shall consist of all lands irrigated from ditches or canals taking water from the Tomichi and its tributaries.

SEC. 22. District No. 29 shall consist of all lands lying in the State of Colorado irrigated from ditches or canals taking water from that part of the San Juan river and its tributaries which lie above the junction of the San Juan river and the Rio Piedra, and including the Rio Piedra.

SEC. 23. District No. 30 shall consist of all lands lying in the State of Colorado irrigated from ditches or canals taking water from that part of the Rio Las Animas and its tributaries which lie in Colorado.

SEC. 24. District No. 31 shall consist of all lands in the State of Colorado irrigated from ditches or canals taking water from that part of the Los Piños river and its tributaries which lie in Colorado.

SEC. 25. District No. 32 shall consist of all lands in the State of Colorado irrigated from ditches or canals taking water from that part of the Rio Las Animas river and its tributaries which lie in Colorado.



SEC. 26. District No. 33 shall consist of all lands lying in the State of Colorado irrigated from ditches or canals taking water from the La Plata river and its tributaries which lie in Colorado.

SEC. 27. District No. 34 shall consist of all lands lying in the State of Colorado irrigated from ditches or canals taking water from the Rio Mancos and its tributaries.

District No. 35 shall consist of all lands lying in the county of Costilla, in this State, watered by the Trinchera river and its tributaries. [S. B. No. 176, approved March 15, 1887. In force June 13, 1887.

District No. 36 shall consist of all the lands irrigated from water taken from the Blue river and its tributaries. [H. B. No. 269, approved April 4, 1887. In force July 3, 1887.

District No. 37 shall consist of all lands lying in the State of Colorado irrigated by waters taken from the Eagle river and its tributaries. [H. B. No. 269, approved April 4, 1887. In force July 3, 1887.

District No. 38 shall consist of all lands lying in the State of Colorado irrigated by waters taken from the Roaring Fork river and its tributaries. [H. B. No. 269, approved April 4, 1887. In force July 3, 1887.

District No. 39 shall consist of all lands lying in the State of Colorado, and located on the north side of the Grand river, and extending from the mouth of the Roaring Fork to the mouth of the Rhone [Roan] creek; all of said lands being irrigated by waters taken from the Grand river or its tributaries, viz: Elk creek, Rifle creek and Rhone [Roan] creek. [H. B. No. 269, approved April 4, 1887. In force July 3, 1887.

District No. 40 shall consist of all lands irrigated from ditches or canals taking water from Crystal creek and Smith's Fork and their tributaries, and so much of all lands lying within the boundaries of Delta county as are irrigated from ditches or canals taking water from the Gunnison river and its tributaries, except lands irrigated from ditches or canals taking water from the Uncompahgre river. [H. B. No. 137, approved April 4, 1887. In force July 3, 1887.

District No. 41 shall consist of all lands irrigated from ditches or canals taking water from the Uncompahgre river and its tributaries, except so much as are within the boundary lines of Ouray county. [H. B. No. 137, approved April 4, 1887. In force July 3, 1887.

District No. 42 shall consist of all lands irrigated from ditches or canals taking water from the Grand and Gunnison rivers and their tributaries within the county of Mesa. [H. B. No. 137, approved April 4, 1887. In force July 3, 1887.

District No. 43 shall consist of all lands irrigated by ditches taking water from the White river and its tributaries. Approved March 15, 1887.

District No. 44 shall consist of all lands irrigated by ditches taking water from the Bear, or Yampa, river and its tributaries. Approved April 2, 1887.

Districts Nos. 30 and 32, it will be observed, are the same.

#### WATER COMMISSIONERS.

[S. B. No. 152.]

AN ACT to amend section 42 (16), chapter LVII., of the General Statutes of the State of Colorado, entitled "Irrigation," requiring the water commissioners to give bond in an amount to be fixed by the board of county commissioners, and providing for the Governor to fix the amount of such bond in the event that the county commissioners disagree thereon.

*Be it enacted by the General Assembly of the State of Colorado:*

SECTION 1. That section 42, of chapter LVII., of the General Statutes of the State of Colorado, entitled "Irrigation," the same being general section 1752 thereof, be, and the same is hereby amended so as to read as follows:

1752. SEC. 42. There shall be one water commissioner for each of the above named districts, and for each district hereafter formed, who shall be appointed by the Governor, to be selected by him from persons recom-

NOTE—Since the issuing of this pamphlet there have been created water district No. 23, see chapter 2; and water district No. 45, see chapter 6.



mended to him by the several boards of county commissioners of the counties into which water districts may extend, and the water commissioner so appointed, shall, before entering upon his duties, give a good and sufficient bond for the faithful discharge of his duties, with not less than three sureties, in a sum not less than one thousand nor more than five thousand dollars, the amount of said bond to be fixed by the county commissioners, and approved by the Governor and State Engineer. The commissioner so appointed shall hold his office until his successor is appointed and qualified; *Provided, however,* That if such water district shall be embraced in more than one county, and the several counties in which such water district is situated, disagree as to the amount of the bond as herein required of water commissioners, then and in that event the Governor shall fix the amount thereof, with the same effect as though fixed by the county commissioners.

SEC. 2. The Governor shall, by like selection and appointment, fill all vacancies which may be occasioned by death, resignation or continued absence from the district, removal, or otherwise. Said county commissioners may, from time to time, recommend persons to be appointed as above provided, and the Governor may, at any time, remove any water commissioner, in his discretion.

Approved March 15, 1887. In force June 13, 1887.

*G. S. 1753. Oath of Office within ten days.]*

That within ten days after his appointment, and before entering upon the duties of his office, such water commissioner shall take and subscribe the oath of office prescribed by the Constitution of this State. [Sec. 17, p. 99, acts 1879.

*G. S. 1754. Duty of Water Commissioners—Open and shut Headgates.]*

It shall be the duty of said water commissioners to divide the water in the natural stream or streams of their district among the several ditches taking water from the same, according to the prior rights of each respectively; in whole or in part to shut and fasten, or cause to be shut and fastened, by order given to any sworn assistant,

sheriff or constable of the county in which the head of such ditch is situated, the head-gates of any ditch or ditches heading in any of the natural streams of the district, which, in a time of a scarcity of water, shall not be entitled to water by reason of the priority of the rights of others below them on the same stream. [Sec. 18, p. 99, acts 1879.

*G. S. 1756. Pay of Commissioners—Duty to keep Accounts—How Paid.]*

The water commissioners herein provided shall be each entitled to pay at the rate of five (\$5) dollars per day for each day he shall be actually employed in the duties of his office; not to exceed eighty days in any one year, to be paid by the county or counties in which his irrigation district may lie. Each water commissioner shall keep a just and true account of his time spent by him in the duties of his office, and shall present a true copy thereof, verified by oath, to the board of commissioners of the county in which his district may lie, and said board of commissioners shall allow the same; and, if said irrigation district shall extend into two or more counties, then such water commissioner shall present his account for his said services, verified as aforesaid, to the board of county commissioners [of each county] into which his district extends, and each board of county commissioners shall allow an equal part thereof. [P. 254, acts 1885.

*G. S. 1757. Commissioner Appoint Assistant—Oath—Pay.]*

Said water commissioner shall have power, in case of emergency, to employ a suitable assistant to aid him in the discharge of his duties. Such assistant shall take the same oath as the water commissioner and shall obey his instructions, and shall be entitled to three dollars per day for every day he is so employed, not to exceed twenty-five days, to be paid upon the certificate of the water commissioner, in the same manner as provided for paying water commissioners. [Sec. 41, p. 107, acts 1879.

*G. S. 1758. Commissioner begin Work when called on.]*

Said water commissioners shall not begin their work

until they shall be called on by two or more owners or managers, or persons controlling ditches in their several districts, by application in writing, stating that there is necessity for their action; and they shall not continue performing services after the necessity therefor shall cease. [Sec. 42, pp. 107-8, acts 1879.

*G. S. 1784. Failure to Offer Evidence—Water Commissioner disregard Claims until, etc.—Party obtain Decree and present Certificate.]*

No claim of priority of any person, association or corporation, on account of any ditch, canal or reservoir, as to which he, or she, or they, shall have failed or refused to offer evidence under any adjudication herein provided for, or heretofore provided for by said act, the title of which is recited in section four hereof, shall be regarded by any water commissioner in distributing water in times of scarcity thereof, until such time as such party shall have, by application to the court having jurisdiction, obtained leave and made proof of the priority of right to which such ditch, canal or reservoir shall be justly entitled, which leave shall be granted in all cases upon terms as to notice to other parties interested, and on payment of all costs, and upon affidavits or petition sworn to, showing the rights claimed, and the ditches, canals and reservoirs, with the names of the owners thereof against which such priority is claimed, nor until a decree adjudging such priority to such ditch, canal or reservoir has been entered, and certificate, such as mentioned in section four hereof, shall have been issued to claimant and presented to the water commissioner. [Sec. 22, pp. 154-5, acts 1881.

In connection with the presentation by claimants to water commissioners of the certificate above referred to, let it be considered also that the water commissioners are under the general control of the superintendents of irrigation; that the superintendents of irrigation are required to enforce distribution of water in accordance with the right of priority as established by judicial decrees; that of these decrees they are provided with certified copies by the clerks of the District courts. If, there-

fore, the superintendent of irrigation shall furnish the water commissioner with a tabulated statement, containing, with reference to each ditch in his district, all the facts that would be set forth in the certificate referred to, and shall certify to the correctness of said tabulated statement, and shall direct the water commissioner to distribute the water in his district thereby (which the instructions herein following provide shall be done); then the water commissioner is furnished with all the information for the distribution of water provided for in a different way, but no more effectively, by G. S. 1784, and is warranted in distributing water according to priority, as decreed, without having received from each claimant his certificate.

[S. B. No. 104.]

AN ACT regulating the distribution of water and the superintendence of canals or ditches used for the purpose of irrigation, and providing a penalty for the violation thereof.

*Be it enacted by the General Assembly of the State of Colorado:*

SEC. 4. Any superintendent, or any person having charge of the said ditch, who shall wilfully neglect or refuse to deliver water as in this act provided, or any person or persons who shall prevent or interfere with the proper delivery of water to the person or persons having the right thereto, shall be guilty of a misdemeanor, and upon conviction thereof shall be subject to a fine of not less than ten nor more than one hundred dollars for each offense, or imprisonment not exceeding one month, or by both such fine and imprisonment; and the money thus collected shall be paid into the general fund of the county in which the misdemeanor has been committed; and the owner or owners of such ditches shall be liable in damages to the person or persons deprived of the use of the water to which they were entitled, as in this act provided.

SEC. 5. Any water commissioner, or his deputy, or assistant, who shall wilfully neglect or refuse, after be-



ing called upon in accordance with section 1758, of the General Statutes of the State, to promptly measure water from the stream, or other source of supply, into the irrigating canals or ditches in his district, according to their respective priorities, to the extent to which water may be actually necessary for the irrigation of lands under such canals or ditches, shall be deemed guilty of a misdemeanor, and shall be subject to the same penalty as provided in section four of this act.

SEC. 6. In all cases declared misdemeanors by this act, any justice of the peace of the county in which the offense was committed, may, upon complaint being made, as is now required by law, issue a warrant directed to any proper officer of the county, for the arrest of any person so charged with any such misdemeanor, and upon the arrest of such person or persons, the justice of the peace before whom such person or persons may be brought for trial, shall hear and determine the cause, and if he find the accused guilty, shall assess the fine, and if imprisonment be a portion of the sentence, then to fix the term of imprisonment, or both, as provided in section 4 of this act; *Provided*, The accused may have a trial by jury, which shall be summoned as in cases before justices of the peace for assault and battery.

Approved March 19, 1887. In force June 17, 1887.

Section 5 is to be taken in connection with G. S. 1754, G. S. 1758, G. S. 1762, G. S. 1766, G. S. 1767 and G. S. 1771, so far as the respective priorities of the ditches are concerned, and with G. S. 1734 and G. S. 1735, so far as water actually necessary for irrigation is concerned. In times of scarcity you could not measure into every ditch sufficient water to irrigate all the lands under it, and no such an impossible construction of the section is contemplated. So far as water for irrigation is concerned, no sacrifice of water actually necessary to those who have complied with the laws and have had their priorities adjudicated, is demanded in favor of those who have not so complied therewith.

## WATER DIVISIONS.

## WATER DIVISIONS CONSTITUTED.

*G. S. 1802.]*

For the better regulation of the distribuion of water for irrigation among the several ditches, canals and reservoirs, into which such water may be lawfully taken, in times of scarcity thereof, the water districts now or to be hereafter established by law shall be constituted into water divisions as follows: Sec. 1, p. 119, acts 1881.

## NO. 1, SOUTH PLATTE DIVISION.

*G. S. 1803.]*

All water districts, now or hereafter to be formed, consisting of lands watered from the South Platte river and its tributaries shall constitute Water Division No. 1, and be named the South Platte Division. Sec. 2, p. 119, acts 1881.

Water Division No. 1, includes Water Districts 1 to 9, inclusive.\*

## NO. 2, ARKANSAS DIVISION.

*G. S. 1804.]*

All water districts, now or hereafter to be formed, consisting of lands watered from the Arkansas river and its tributaries, shall constitute Water Division No. 2, and be named the Arkansas Division. Sec. 3, p. 119, acts 1881.

Water Division No. 2 includes Water Districts 10 to 19, inclusive.

## NO. 3, RIO GRANDE DIVISION.

*G. S. 1805.]*

All water districts, now or hereafter to be formed, consisting of lands watered from the Rio Grande river and its tributaries, shall constitute Water Division No. 3, and be named the Rio Grande Division. Sec. 4, p. 119, acts 1881.

Water Division No. 3 includes Water Districts Nos. 20 to 27, inclusive, and 35.

\* Water Division No. 1, now includes Water District No. 23, also. See Chapter 1.



*Session Laws 1885, Sec. 2, p. 256.]*

All water districts, now or hereafter to be formed, consisting of lands in the State of Colorado watered by the San Juan river and its tributaries, shall constitute Water Division No. 4, and be named the San Juan Division.

Water Division No. 4 includes Water Districts Nos. 29, 30, 31, 32, 33 and 34.

*Session Laws 1887, Sec. 1, p. 313.]*

All water districts, now or hereafter to be formed, consisting of lands in the State of Colorado, watered by the Grand river and its tributaries, shall constitute Water Division No. 5, and be named the Grand River Division.

Water Division No. 5 includes Water Districts Nos. 28, 36, 37, 38, 39, 40, 41, 42, 43 and 44.\*

#### SUPERINTENDENTS OF IRRIGATION.

[S. B. No. 113.]

AN ACT providing for the appointment of superintendents of irrigation for the water divisions of this State; fixing their compensation and providing for the payment thereof; prescribing their duties, and requiring a bond for the faithful performance of such; requiring clerks of District courts to furnish such superintendents with certain certified decrees, and providing for the payment of such clerks' fees.

*Be it enacted by the General Assembly of the State of Colorado:*

SECTION 1. That the Governor shall appoint a superintendent of irrigation for each of the water divisions now existing within the State, or which may hereafter be created; such superintendents of irrigation to hold office for a period of two years from the date of their respective appointments, or until their successors shall be appointed and qualified. The Governor may, at any time, in his discretion, remove said superintendents of irrigation, or any of them, and appoint others in their stead, for the remainder of said term of two years; *Provided*, That the Governor shall not appoint a

\* Water Division No. 5 now includes Water District No. 45. See Chapter 6.

superintendent of irrigation in any district until the board of county commissioners of some one or more of the counties whose territory, or any part of whose territory, is included in such water district shall have, at a meeting regularly called and held, adopted a resolution requesting such appointment to be made, and have had the same certified to the Governor.

SEC. 2. Said superintendent of irrigation shall have general control over the water commissioners of the several districts within his division. He shall, under the general supervision of the State Engineer, execute the laws of the State relative to the distribution of water in accordance with the rights of priority of appropriation, as established by judicial decrees, and perform such other functions as may be assigned to him by the State Engineer.

SEC. 3. Said superintendent of irrigation shall, in the distribution of water, be governed by the regulations of this act, and acts that are now in force; but, for the better discharge of his duties, he shall have the authority to make such other regulations to secure the equal and fair distribution of water, in accordance with the rights of priority of appropriation, as may in his judgment be needed in his division; *Provided*, Such regulations shall not be in violation of any part of this act, or other laws of the State, but shall be merely supplementary to and necessary to enforce to provisions of the General Laws and amendments thereto.

SEC. 4. Any person, ditch company or ditch owner who may deem himself injured or discriminated against by any such order or regulation of such superintendent of irrigation, shall have the right to appeal from the same to the State Engineer, by filing with the State Engineer a copy of the order or regulation complained of, and a statement of the manner in which the same injuriously affects the petitioner's interest. The State Engineer shall, after due notice, hear whatever testimony may be brought forward by the petitioner, either orally or by way of affidavits, and through the superintendent of irrigation, shall have power to suspend, amend or confirm the order complained of.

SEC. 5. Said superintendent of irrigation shall commence the discharge of his duties in his division as soon as the first water commissioner in any district within his division shall be called out, and shall continue to discharge his duties until the last water commissioner in any district of his division ceases to be needed. Each water commissioner shall report immediately to the superintendent of irrigation of his division when he is called out, and when he ceases to be needed; and shall, during the continuance of his duties, be under the control of the superintendent of irrigation of his division. The superintendent of irrigation shall receive, as compensation, five dollars per day for every day during which he is employed in the discharge of his duty.

SEC. 6. Within thirty days after the appointment of said superintendent of irrigation, it shall be his duty to give bond to the amount of five thousand dollars for the faithful discharge of his duty; said bond to be approved by the board of county commissioners of the county wherein said superintendent of irrigation may reside, and to be filed in the office of the county clerk and recorder of such county.

SEC. 7. Within thirty days after his appointment, said superintendent of irrigation shall send to the clerk of the District court, within his division, of such counties as have had rendered, by the District court of such county, judicial decrees, fixing the priorities of appropriation of water for irrigation purposes for any water district, a notification of his appointment to such office, and shall request of the said clerk a certified copy of every decree of the District court establishing priorities of appropriation of water used for irrigation purposes within that district. Thereupon it shall be the duty of such clerk within ten days after the receipt of such request from said superintendent of irrigation, to prepare a certified copy of all decrees of such District court establishing priorities of water rights made within that district, under the provisions of the General Statutes of the State of Colorado, and transmit the same to the superintendent of irrigation requesting it. Said superintendent of irrigation shall then cause to be prepared a book to be entitled "The Register of Priorities of Ap-

appropriation of Water Rights for Water Division No. —, State of Colorado," within which he shall enter and preserve such certified copies of decrees. Said superintendent of irrigation shall, from such certified copies of decrees, make out a list of all the ditches, canals and reservoirs entitled to appropriations of water within his division, arranging and numbering the same in consecutive order according to the dates of their respective appropriations within his division, and without regard to the number such ditches, canals or reservoirs may bear within their respective water districts. Said superintendent of irrigation shall make from his register a tabulated statement of all the ditches, canals and reservoirs in his division, whose priorities have been decreed, which statement shall contain the following information concerning each ditch, canal and reservoir arranged in separate columns: The name of the ditch, canal or reservoir; its number in his division; the district in which it is situated; the number of it in its proper district; and the number of cubic feet of water per second to which it is entitled, and such other and further information as he may deem useful to the proper discharge of his duty. In case any decrees of court establishing priorities of appropriation of water for irrigation purposes are made after the transmittal of the copy of previous decrees to the superintendent of irrigation, it shall be the duty of the clerk of the court wherein such decree is rendered, to transmit to the superintendent of irrigation of the division within which such county is situated, within ten days after it is rendered, a copy of such decree, and the superintendent of irrigation shall enter the same in his register. Such register to be filed and kept in the office of the State Engineer.

SEC. 8. Said superintendent of irrigation shall have the right to call out any water commissioner of any water district within his division, at any time he may deem it necessary, and he shall have the power to perform the regular duties of water commissioner in all the districts within his division.

SEC. 9. All water commissioners shall make reports to the superintendent of irrigation of their division as often as may be deemed necessary by said superin-



tendent. Said reports shall contain the following information: The amount of water necessary to supply all the ditches, canals and reservoirs of that district; the amount of water actually coming into the district to supply such ditches, canals and reservoirs; whether such supply is on the increase or decrease; what ditches, canals or reservoirs are at that time without their proper supply; the probability as to what the supply will be during the period before the next report will be required; and such other and further information as the superintendent of irrigation of that division may suggest. Said superintendent of irrigation shall carefully file and preserve such reports, and shall from them ascertain what ditches, canals and reservoirs are, and what are not, receiving their proper supply of water, and if it shall appear that in any district in that division any ditch, canal or reservoir is receiving water whose priority post-dates that of the ditch, canal or reservoir in another district, as ascertained from his register, he shall at once order such post-dated ditch, canal or reservoir shut down and the water given to the elder ditch, canal or reservoir. His orders being directed at all times to the enforcement of priority of appropriation, according to his tabulated statement of priorities, to the whole division, and without regard to the district within which the ditches, canals and reservoirs may be located. The reports of water commissioners, by the superintendents of irrigation, shall be filed and kept in the office of the State Engineer.

SEC. 10. In case any ditch, canal or reservoir, in any district within such superintendent of irrigation's division, shall fail to receive its regular supply of water, the owner or controller of such ditch, canal or reservoir may report such fact to the water commissioner of that district, who shall immediately apportion the water in his district, and send forthwith, by telegram if necessary, a report of such fact to the superintendent of irrigation of his division; and thereupon it shall be the duty of said superintendent to compare such report with his register, and if any ditch, canal or reservoir of any other district of his division is receiving water to which any ditch, canal or reservoir of any other district is en-

titled, he shall at once order the shutting down of the post-dated ditches, canals or reservoirs, and the water given to the ditches, canals or reservoirs having the priority of appropriation; *Provided, however,* That nothing in this act shall be construed as interfering with the priority of water for domestic use.

SEC. 11. The expenses and salary of the superintendent of irrigation shall be paid *pro rata* by the counties interested, in the same manner as the fees of water commissioners are paid; and the fees of the clerks of the District courts, for services rendered under the provisions of this act, shall also be paid by the counties interested, upon the said clerk rendering his account, certified by the District judge, to the boards of county commissioners of the counties embraced in the water divisions in case of which the services have been rendered.

SEC. 12. That it is the opinion of this General Assembly that an emergency exists; therefore, this act shall be in force and take effect from and after its passage.

Approved and in force April 4, 1887.

#### MISCELLANEOUS LAWS RELATING TO IRRIGATION.

##### *G. S. 1725. Conducting Water in Natural Streams.]*

The owners of any reservoir may conduct the water therefrom into and along any of the natural streams of the State, but not so as to raise the waters thereof above ordinary high-water mark, and may take the same out again at any point desired, without regard to the prior rights of others to water from said stream; but due allowance shall be made for evaporation and scapage, the amount to be determined by the commissioners of irrigation of the district; or, if there are no such commissioners, then by the county commissioners of the county in which the water shall be taken out for use. [Sec. 39, p. 107, acts 1879.

The calculation of loss occasioned by seepage and evaporation will be made for you in this office, should you so desire it, upon your application in writing to that effect, accompanied by an accurate and complete description of the existing conditions.



*G. S. 1719. Extending Head of Ditch Up Stream.]*

In case the channel of any natural stream shall become so cut out, lowered, turned aside or otherwise changed from any cause, as to prevent any ditch, canal or feeder of any reservoir from receiving the proper inflow of water to which it may be entitled from such natural stream, the owner or owners of such ditch, canal or feeder shall have the right to extend the head of such ditch, canal or feeder to such distance up the stream which supplies the same, as may be necessary for securing a sufficient flow of water into the same, and for that purpose shall have the same right to maintain proceedings for condemnation of right of way for such extension as in case of constructing a new ditch, and the priority of right to take water from such stream through such ditch, canal or feeder, as to any such ditch, canal or feeder, shall remain unaffected in any respect by reason of such extension; *Provided, however,* That no such extension shall interfere with the complete use or enjoyment of any other ditch, canal or feeder. [Sec. 1, pp. 161-2, acts 1881.

*G. S. 1727. Wheels, etc., on Streams.]*

All persons on the margin, brink, neighborhood or precinct of any stream of water shall have the right and power to place upon the bank of said stream a wheel or other machine for the purpose of raising water to the level required for the purpose of irrigation, and the right of way shall not be refused by the owner of any tract of land upon which it is required, subject, of course, to the like regulations as required for ditches, and laid down in sections hereinbefore enumerated. [Sec. 8, pp. 68-9, acts 1861—Sec. 6, p. 364, R. S.—Sec. 1377 (6), p. 516, G. L.

*G. S. 1734. Running Excess of Water Forbidden.*

During the summer season it shall not be lawful for any person or persons to run through his or their irrigating ditch any greater quantity of water than is absolutely necessary for irrigating his or their said land, and for domestic and stock purposes; it being the intent and meaning of this section to prevent the wasting and use-

less discharge and running away of water. [Sec. 2, p. 78, acts 1876—Sec. 1386 (2), p. 518, G. L.]

*G. S. 1735. Penalty for Violation of this Act.*

Any person who shall wilfully violate any of the provisions of this act, shall, on conviction thereof before any court having competent jurisdiction, be fined in a sum of not less than one hundred (100) dollars. Suits for penalties under this act shall be brought in the name of The People of the State of Colorado. [Sec. 3, p. 78, acts 1876—Sec. 1387 (3), p. 518, G. L.]

*G. S. 1736. Owner keep Head-Gate—Size of Timbers.]*

That the owner or owners of every irrigating ditch, flume or canal, in this State, shall be required to erect and keep in good repair a head-gate at the head of their ditch, flume or canal. Such head-gate, together with the necessary embankments, shall be of sufficient height and strength to control the water at all ordinary stages. The framework of such head-gate shall be constructed of timber not less than four inches square, and the bottom, sides and gate or gates shall be of plank, not less than two inches in thickness. [Sec. 1, p. 165, acts 1881.]

*G. S. 1737. Liability of Owners for Neglect, Refusal.]*

Owners of all ditches shall be liable for all damages resulting from their neglect or refusal to comply with the provisions of section one of this act. [Sec. 1, p. 165, acts 1881.]

The section referred to in G. S. 1737 is G. S. 1736.

*G. S. 3472. How Measured.]*

\* \* \* Water sold by the inch by any individual or corporation shall be measured as follows, to wit: Every inch shall be considered equal to an inch square orifice under a five-inch pressure, and a five-inch pressure shall be from the top of the orifice of the box put into the banks of the ditch, to the surface of water; said boxes, or any slot or aperture through which such water may be measured, shall in all cases be six inches perpendicular, inside measurement, except boxes delivering less than twelve inches, which may be square, with

or without slides; all slides for the same shall move horizontally, and not otherwise; and said box put into the banks of ditch shall have a descending grade from the water in ditch of not less than one-eighth of an inch to the foot. [Sec. 2779 (3), pp. 926-7, G. L.—Sec. 3, p. 638, R. S.—Amd. Sec. 1, pp. 308-9, acts 1874 and 1877.

The unit of measure described in G. S. 3472 is not used in the distribution of water from the natural streams. It is inaccurate. A variation of forty per cent. may be made in the delivery of the box and yet have it arranged in conformity with the requirements of the statute. You are urged, then, to discountenance the use of the term. Anywhere from thirty to fifty so-called statutory inches may be considered equal to a cubic foot of water per second. The unit of measurement designated "cubic foot of water per second," is a definite and desirable one, and the one used in distributing water from the natural streams of the State.

*G. S. 1812. Shall Measure Ditches' Feeders—Reservoirs.]*

Said State Engineer shall, on request of any party interested, on payment of his *per diem* charges and reasonable expenses, measure and ascertain the carrying capacity of any ditch, canal or feeder, or any reservoir, hereafter constructed or enlarged, and give to the party or parties requiring his services an official certificate of the size and carrying capacity of such ditch, canal or feeder, in cubic feet per second, as he shall find it to be at the time of measuring the same. [Sec. 11, p. 121, acts 1881.

*G. S. 1813. Owners of Ditches shall Construct Weirs—State Engineer shall Compute Water per Second.]*

For the more accurate and convenient measurement of any water appropriated, pursuant to any judgment or decree rendered by any court establishing the claims of priority of any ditch, canal or reservoir, the owners thereof shall construct and maintain, under the supervision of the State Engineer, a measuring weir or other

device for measuring the flow, in cubic feet per second, the water at the head of such ditch, canal or reservoir, or as near thereto as practicable. The State Engineer shall compute and arrange in tabular form the amount of water that will pass such weir or measuring device in cubic feet per second, at the different stages thereof, and he shall furnish a copy of a statement thereof to any water commissioners having control of such ditch, canal or reservoir. [Sec. 12, pp. 121-2, acts 1881.

The measuring device provided for in G. S. 1813 shall be an open flume with apron and wings, constructed as shown on plates "A" and "B" accompanying this work. Where the bottom of the ditch exceeds six feet in width the flume is to be sixteen feet in length, and where less than six feet in width, the flume is to be twelve feet in length, exclusive, in each case of the apron and wings. The width of the flume is to be that of the ditch. The sides to be perpendicular and boarded upon the inside of posts, and to be of sufficient height to carry the greatest amount of water likely to flow in the ditch. The top of the floor must be on the grade of the bottom of the ditch. The flume is to be erected on as straight a portion of the ditch as practicable, and about four hundred feet below the head-gate.

After the measuring flume is erected, it will be rated by the State Engineer, or his assistant, and a datum mark will be made thereon, indicating the height to which the water commissioners may raise the water in the flume to allow the ditch the amount decreed thereto by the District court. No flume will be rated in which there is dead water exceeding one-tenth of a foot in depth when the head-gate is closed.



# LETTER OF INSTRUCTION

## TO SUPERINTENDENTS OF

# IRRIGATION AND WATER COMMISSIONERS,

### BY THE

## STATE ENGINEER.

Commissioners will communicate with this office through the superintendents of irrigation of their respective divisions, except in cases of pressing importance, or in direct reply to letters from this office.

Superintendents of irrigation will, in a book furnished for the purpose by this office, enter the tabulated statements provided for in section 7, of Senate Bill No. 113, with the additions thereto indicated as desirable below, in columns having the following headings:

No. of Division in which situated.	No. of District in which situated.	NAME OF DITCH, CANAL OR RESERVOIR	Stream from which water is taken.	Date of appropriation.	Cubic feet of water per sec. decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet of water previously appropriated in district.	Order of priority in district.	Cubic feet of water previously appropriated in division.	Order of priority in division.	Embodied in decree recorded on page	Rated as entered on page
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Superintendents of irrigation will be furnished by the State Engineer with a book for each district in his division, which book shall be entitled: "Register of District No. . . ."

Superintendents of irrigation will enter in said book a tabulated statement relative to the ditches and reser-

voirs of the appropriate district, which statement shall show in separate columns (as hereinbelow indicated) the

NAME OF DITCH OR CANAL.	Name of stream from which water is diverted.	Order of priority.	Date of appropriation.	Cubic feet of water per sec- ond appropri- ated to each priority.	Summation of appropriations of each ditch or canal.	Cubic feet per second previ- ously appro- priated.
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and for Reservoir Priorities the

NAME OF RESERVOIR.	Name of stream from which water is taken.	Order of priority.	Date of appropriation.	Capacity of reservoir in cubic feet.	Cubic feet of water per sec- ond appropri- ated to each priority.	Summation of appropriations to each reser- voir.	Cubic feet of water previ- ously appro- priated.
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They will also certify to the correctness of this tabulated statement.

There shall also be entered in said register by the superintendent of irrigation, the rating of each measuring flume in the district constructed in compliance with G. S. 1813. The latter information will be furnished by the State Engineer. The register so prepared shall be loaned to the respective water commissioners of his division during the irrigating season, except when occasion demands that they shall be called in for posting.

Said registers shall be kept as nearly as possible posted to date by the superintendents of irrigation. They shall be filed, when not needed by the water commissioners, in the office of the State Engineer. The superintendents of irrigation shall furnish the water commissioners with written instructions to distribute the water of their district in accordance with the statements in said register.

Superintendents of irrigation will report in writing to this office on the first day of each month, or as soon thereafter as possible, from April to November, inclusive. Such report will be accompanied by the reports received from the water commissioners during the previous month. It shall contain such information as the superintendent regards as likely to be of service to the State Engineer in his duties, and such suggestions as he



may have to make for the advancement of irrigation. It shall especially contain a list of the measuring flumes erected but not rated, and of the measuring flumes previously rated but out of order in each district in his division. Registers shall be delivered to the water commissioners by the superintendents of irrigation by July 1, of the year 1887, and by April 1, of the year 1888.

Very respectfully,

J. S. GREENE,

*State Engineer.*

DENVER, COLORADO, June 1, 1888.

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The distribution of water having been fairly started in the season of 1887, attention was next directed to the

### MEASUREMENT OF STREAMS.

Briefly stated, this involved for each stream measured:

*First*—An examination of the stream, and a selection of a portion thereof having as nearly a straight channel of as nearly a uniform cross-section as was possible to find above the heads of ditches and convenient of access.

*Second*—The removal from the channel, so far as possible with the limited appropriation for such purpose at command, of obstacles to the even flow of the water.

*Third*—The determination of the profile of a section of the channel, at a point about midway of the straight portion selected, and at right angles to the course thereof.

*Fourth*—The measurements of the mean velocities of the water passing through various portions of the section at different stages of the water.

*Fifth*—The erection of a clock-work register, or of a plain gauge rod at the station, so that the mean daily depth of water at the station might be known.

*Sixth*—The weekly transmittal by the observer to this office of the record sheet, or the report of his daily observations for the previous week.

*Seventh*—The determination in this office of the mean daily discharge of the stream in cubic feet per second,

by computation or graphics, the record thereof in the ledgers in this office, and the graphical presentation thereof on plates, as shown in Part II. of this report.

The *clock-work register* consists of a small horizontal cylinder, which is so connected with an eight-day clock as to turn exactly once in seven days, of a sheet of paper wrapped around the cylinder, and so divided by scale as to indicate days and hours in one direction, and feet and fractions thereof in the other direction; of a pencil point, resting on this traveling sheet of paper, and so connected with a float resting on the surface of the water, as to move over the sheet a corresponding distance, according to the scale, to that which the float moves vertically, in feet or fractions thereof, with the rise and fall of the surface of the water of the stream.

The *plain gauge-rods*, are simply rods divided into feet and tenths, and properly marked, set vertically, or at a known slope, and the level of the surface of the water is read thereon by the observer, usually three times a day. Both the register and plain rods are so arranged that when the readings thereof are known, the mean depth of the water in the cross-section, and the area of the cross-section in square feet, are readily obtainable.

The current observations were made at each station with the *Colorado Current Meter*, an improvement on the old form of velocity wheel, or tachometer, designed by my predecessor, Mr. E. S. Nettleton. This instrument gave very satisfactory results.

Below is an exhibit of the record sheet used with the clock-work register, and shows the continuous record of the height of the water passing through the flume at guaging station No. 1, for the week ending August 6, 1888. The drawing shown is two-thirds of the actual size of the record sheets used:

And the following is an example of the blank forms for *plain rod gauge readings* furnished observers, the last two columns being filled out in this office:

*Record of the stage of Water at Gauging Station No. .... on ..... for the week ending Saturday, ..... 188--*

DAY.	Time of observation— <i>a. m.</i>	Corresponding gauge reading.	Time of observation— <i>m.</i>	Corresponding gauge reading.	Time of observation— <i>p. m.</i>	Corresponding gauge reading.	Mean gauge reading for the day.	Corresponding discharge in cubic feet per second.
Sunday . . . . .								
Monday . . . . .								
Tuesday . . . . .								
Wednesday . . . . .								
Thursday . . . . .								
Friday . . . . .								
Saturday . . . . .								

*Remarks :* -----  
----- *Observer.*

#### LIST OF STREAMS MEASURED.

*Cache la Poudre River, Gauging Station No. 1.*—This very fine station, which was constructed under the supervision of Mr. E. S. Nettleton, in the spring of 1884, from contributions to the amount of about sixteen hundred and fifty dollars, made by the irrigators of the Cache la Poudre valley, was, of course, retained. It is situated about one-half of a mile above the mouth of the cañon of that stream. It became necessary to re-gauge it by reason of the change in the floor of the flume. This station, which is fully described in the report of the State Engineer for 1883-84, now needs repairing. The stage of water at this station is recorded by a clock-work register similar to that described above. Mr. John L.

Armstrong has been the observer for the past two years. A graphical presentation of the mean daily discharge in cubic feet per second is shown on a plate in Part II. of this report. The discharge for the years 1884, 1885, 1886, as well as those of 1887 and 1888, are shown on this plate. Especial attention is called to it, as it indicates the variations in the quantity of water carried in different years for a longer period than do the other plates. It shows the great scarcity of water in the Cache la Poudre for the past two years, and especially for the season of 1888. The same low stage of water has been observed in the other streams of the State during the past summer.

*Arkansas River, Gauging Station No. 2.*—A continuous record of the height of the water of this stream was taken at the bridge crossing the river at Mechanics' street, in Pueblo, during a portion of the seasons of 1885 and 1886, and the discharge of that stream computed for those seasons, but the cross-section of the stream was found to change so frequently in that locality that the daily discharge, as computed, was not regarded by my predecessor as very satisfactory. Accordingly, in June, 1887, a new location for the station was sought, and it was placed on a comparatively straight and uniform portion of the Arkansas river, some nine miles above Pueblo. But the same tendency to a change of form of the cross-section, though, perhaps, not to so marked a degree as that found at Pueblo, was observed here; and the station was moved in May, 1888, to the foot-bridge crossing the Arkansas river at the Hot Springs hotel, two miles above Cañon City. The clock-work register was used during 1887, but owing to the expense of placing it in position, a plain gauge rod was arranged for the new station. Mr. L. H. Turner was the observer in 1887, and Mr. F. M. Roberts in 1888.



The mean daily discharge of this river is shown in Part II. hereof.

*South Platte River, Gauging Station No. 3.*—This station was established July 12, 1887. It is situated about one-quarter of a mile above Deansbury station, in the cañon of the South Platte River. The effort was made to use here the more complicated register described, but the observer finding it difficult to keep the apparatus in adjustment, and the expense occasioned by the necessity of sending assistants from this office to look after it, led to the exchange thereof for a plain rod; after which the reports as to the height of the water were more satisfactory. There have been two observers at this station—Mr. M. B. Walch and Mr. George Dawes. The mean daily discharge of this stream for the years 1887 and 1888 is shown in Part II. hereof.

*Clear Creek, Gauging Station No. 4.*—The station on this stream was established August 3, 1887, and is situated about two hundred and fifty feet below what is known in the locality as Huntsman's Section House, and is some seven miles above Golden. This station was destroyed by flood August 1, 1888, but was soon afterwards re-established about fifty feet below its former position. By reason of the collection of sediment, of which there is more than the usual amount in this stream, around the well in which the float hung, and the consequent disarrangement of the registering apparatus, the apparatus was replaced by a plain rod. In Part II. is shown the mean daily discharge of this stream for the seasons of 1887 and 1888. Mr. John E. Karlson and Mr. Simon Johnson have been the observers.

*St. Vrain Creek, Gauging Station No. 5.*—On August 9, 1887, this station was established just below the two main forks of the St. Vrain creek, and about one-quarter of a mile below Lyons' Station, on the Denver, Utah and Pacific Railroad. The plain gauge rod was used,



the observations were taken by Mr. John Pounder, and the mean daily discharge for the years 1887 and 1888 being given in Part II. of this report.

*Bear Creek, Gauging Station No. 6.*—This station was established August 17, 1887, about two and one-half miles above Morrison and eight hundred feet below the toll-gate house. The plain rod was used. The record of the height of the stream was kept in 1887 by Mr. E. C. Christensen and in 1888 by Mr. G. C. Hoyt. The mean daily discharge of Bear creek for the years 1887 and 1888 are found in Part II.

*Boulder Creek, Gauging Station No. 7.*—This station was established on the 20th of August, 1887, at a point on Boulder creek where it is crossed by the first wagon bridge above and four miles distant from the town of Boulder, the mean daily discharge being shown in Part II. of this report. The observer was Mr. D. E. Welch. Mr. Welch had also the charge of a small station on Four-Mile creek, adjacent to his station on Boulder creek.

*Big Thompson Creek, Gauging Station No. 8.*—This station was established August 25, 1887, and is located at a point on the Big Thompson creek about ten miles west of Loveland. The plain rod was used, the observations being taken by Mr. A. Straight. The mean daily discharge is shown in Part II. of this report.

*South Boulder Creek, Gauging Station No. 9.*—The station on this stream is situated about two hundred and fifty feet above Kneale's saw-mill, and was established April 6, 1888. The record of the height of water was taken by Mr. C. A. Kneale, the observer, on a plain gauge rod. The mean daily discharge is graphically shown in Part II. of this report.

In connection with these stations, attention is called to the facts that, with the exception of Gauging Station No. 1, they were established at but a slight expense in

the matter of materials, and that the discharge, as determined from the cross-section of a stream in its natural state, or only slightly cleared of obstructions to the even flow of the water, is not so accurate as where the stream is made to pass through an open flume, or over a weir. The discharges, as shown on the plates of Part II., are probably within 6 per cent., though that of the Arkansas, for the years 1886 and 1887, may vary as much as 10 per cent., while that of the Cache la Poudre is no doubt within 3 per cent.

#### FILING OF PLATS AND STATEMENTS IN THE STATE ENGINEER'S OFFICE.

During the period devoted to the establishing of the gauging stations above mentioned, that enactment of the Legislature requiring plats and statements relating to new ditches and reservoirs to be filed in the office of the State Engineer went into force. In conformity with the law, plats and statements began to be filed in this office. It was not at first supposed that this would be a serious drain upon the time of the State Engineer, or the fund at his disposal for assistants, but with each succeeding month the labor connected with filing, indexing and tabulating of these papers, aiding those so desiring to examine and copy them, and with answering the letters relative thereto, so increased, that almost the entire time of one assistant was necessarily devoted to this work during the latter portion of the season just passed.

No doubt the labor required to properly care for these important papers was not recognized, at the time of the passage of the law, by the Legislature, or some provision for the extra expense to be incurred by this office would have been made.

Tabulated statements have been made showing, so far as the information was obtainable, with reference to

each ditch concerning which papers have been filed, the name of the ditch, the name of the stream from which it draws its supply of water, the date of filing in the State Engineer's office, the time of commencement of work on the structure, the capacity thereof claimed in cubic feet per second, and the names of the claimants.

Tabulated statements relative to reservoirs, show the name of the ditch supplying the reservoir, the capacity of the reservoir in cubic feet, and are otherwise similar to the tabulated statements relating to ditches.

These tables relative to ditches and reservoirs will be found in the chapters devoted to the different water divisions of the State. (See Table of Contents.) It will be observed that a separate table is made out for each water district, and that the ditches are arranged in the tables according to the date of the filing of the plats and statements in this office. By reason of the indefiniteness of the descriptions of some of the ditches and reservoirs, as well as by reason of the fact that the State is not yet fully divided into water divisions and water districts, miscellaneous tables are necessary, and these will be found at the close of the chapters devoted to the division under which they fall, when they can be located in a division, but in no district; while those ditches and reservoirs which fall in no division will be found in a *general miscellaneous table* at the close of Chapter VII. It will be noticed, too, that all of the statements do not relate to new ditches and reservoirs, but that the great majority do, and these must aggregate some six hundred, indicating a most surprising and gratifying progress in irrigation work.

#### IRRIGATION STATISTICS.

As the season of 1887 advanced, water commissioners and superintendents of irrigation began to ply this office with letters asking for advice in particular cases, and frequent complaints began to be received from ditch

owners against the actions of commissioners in cases which did not seem to be completely and clearly covered by the laws. These letters and complaints usually concerned the rights of adjacent ditches, and were seldom specific in the descriptions of the relative location of the ditches, a knowledge of which was generally necessary to the issuing of proper advice or instructions from this office. It was observed, too, that the water commissioners themselves, and especially those newly appointed, felt the need of plats showing the ditches and reservoirs of their districts, as did also the superintendents of irrigation. The latter were greatly inconvenienced in their calculations by reason of the facts, developed from time to time, which went to show that ditches embraced in decrees, if ever constructed, had been abandoned, or, at least, no longer made claim to water; that other ditches embraced in decrees had been consolidated for portions of their length, or had changed the positions of their head-gates, or no longer needed the amount of water decreed to them by the courts, or were demanding more water than could be effectively and economically used. In fact, it became plain that Colorado had reached, in some of its water districts, that stage of irrigation development which necessitates many of those steps for the advancement of its agricultural interests which other irrigating people have been obliged to adopt, and which have for their object not only the securing of a knowledge of its available waters for irrigation, but of the claims against them and of the use made of the water to satisfy said claims; to the end, not alone that this department might successfully perform the duties intrusted to it, but that the Legislature and people of the State might know the demands already made upon the water resources of the State, and so prevent measures that might result unsatisfactorily, or provide for the possible achievements with the waters not yet utilized.



In casting about for the means of collecting this information so essential to the systematic management of the distribution of water by this department, attention was drawn to the fact that the superintendents of irrigation and water commissioners had afforded them very favorable opportunities, in the discharge of their duties, for gathering such practical and valuable knowledge concerning their divisions and districts, as would, if made a matter of record, be of great service to this office, themselves and their successors, as well as to students of irrigation matters in this State.

In the matter of preparing plats of the water districts, a most important portion of the statistics, forming a foundation upon which to rest the other portions, it seemed expecting a good deal to ask assistance in this matter of the water commissioners, men not, as a rule, skilled in map making. There was naturally considerable hesitation, too, in seeking, and depending upon, the aid of the water commissioners in the preparation of the maps, because it was so entirely different from that method of securing irrigation maps adopted by other irrigating people, as exemplified, for instance, in the history of California map making. In that commonwealth, there are said to be in course of construction, or ready for publication, magnificent drainage, topographical and land maps, each covering the entire State, as well as detail maps showing rivers, ditches, land divisions and extent and classifications of irrigations in various irrigating districts. These maps are works of art, prepared, or being prepared, by the most skillful of engineers and draughtsmen, with large appropriations at their disposal.

But these elegant maps are still, it is believed, in the archives of the State. They have been of little service to the people or the department, and are awaiting further appropriations of large sums for their completion and



publication, which may be delayed until they no longer correctly represent the existing conditions.

There is, perhaps, something to be learned by Colorado from this condition of affairs in a sister commonwealth; and it would seem to be, that her irrigation maps should be promptly issued, though not elaborately and expensively made, or minutely correct, that they may go hand in hand with irrigation development in other respects, leaving to the future for some years the accurate and expensive work, which, in this direction, will, of course, have to be done.

Influenced by these considerations, a few of the water commissioners were furnished, late in the season of 1887, with plats prepared in this office, and showing the streams and subdivisions of land as set forth in the Government maps in the office of the Surveyor General of Colorado, and they were requested to draw thereon the ditches and reservoirs of their districts. The success of the commissioners selected for the performance of this duty was quite gratifying, as were also their efforts to furnish this office with certain other valuable information concerning their respective districts, and led to the embodying in the "General Instructions," issued from this office July 1, 1888, of the following sections, in relation to the collection of statistics:

"Each superintendent of irrigation will be supplied, on application to the State Engineer, with a plat of each water district in his division. He will see that every ditch in each district of his division, whether said ditch be embraced in a decree or filed in the county clerk's office or not, is drawn on the plat of the proper district, and that the said plats are filed in the office of the State Engineer on or before August 15, 1888.

"He will have prepared by his water commissioners, for each district in his division, a statement which shall show with reference to each ditch in each district, for the year 1888, in separate columns (as herein below indicated) the

NAME OF DITCH.	The length thereof in miles.	The number of days water was carried therein during the season of 1888.	The average amount of water in cubic feet, per second, so carried.
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And he will file these statements in the State Engineer's office by September 15, 1888.

Each superintendent of irrigation will, in person, or through his water commissioners, cause to be made out with reference to each district in his division, and file with the State Engineer, on or before August 15, 1888, a statement, which shall show with reference to each ditch in each district for the irrigating season of 1888, (as herein below indicated) the

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
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By seeded grasses is meant cultivated grasses, other than alfalfa, as timothy, clover, etc.

Each water commissioner will embody in a final report to the superintendent of irrigation of the division embracing his district, a full account of his labors during his incumbency of the office of water commissioner, and such final report will be sent to the superintendent of irrigation by September 1, 1888.

Each superintendent of irrigation will embody in his final report to the State Engineer a full account of the labors of his office during his occupancy thereof, and will accompany his final report with the reports of the water commissioners of his division, and file it with the State Engineer on or before September 15, 1888. The labors thus put upon superintendents of irrigation and water commissioners are considerable. The allowance for such services, especially that to water commissioners, is small. But the demand for such information is urgent, and the collection thereof can no longer be delayed. The reports of the superintendents of irriga-

tion and those of water commissioners will be embodied, to a considerable extent, in the published report made this fall by the State Engineer to the Governor, and it will therein be evident to what extent the different superintendents and commissioners have endeavored to set forth the irrigation condition of their divisions and districts. The plats should be very carefully prepared, as they also will be published as part of the report of the official preparing them."

Not all of the plats sent in by the commissioners, nor all of the statistics collected, will be included in this report. In some cases they were not quite satisfactory, or not deemed of sufficient value to warrant the expense incurred in publishing them.

The following plats will be found in Part II. of this report. A drainage map of the State, showing the division of the State into water divisions and water districts; showing, also, what portions of the State have not yet been so subdivided; and plats of Water Districts Nos. 1, 2, 3, 4, 5, 7, 8, 9, 10, 14, 15, 16, 22 and 34.

### RATING FLUMES.

Section 1813 of the General Statutes, which is found in this chapter under the head of "Miscellaneous Laws," calls for the construction by the owners of ditches of a measuring weir or device in their ditches for measuring the flow of water; and provides for the computing by the State Engineer of the amount of water which, at various stages, will pass through the weir, and the furnishing of the water commissioners with that information.

The form of device to be used was left to the State Engineer, and that adopted by my predecessor, and retained during the past two years, is simply an open flume, as shown on the opposite page, and designated "Plate A." This open flume was recommended to be placed in a straight portion of the ditch, some eighth of a mile below the head gate thereof, to be of even width

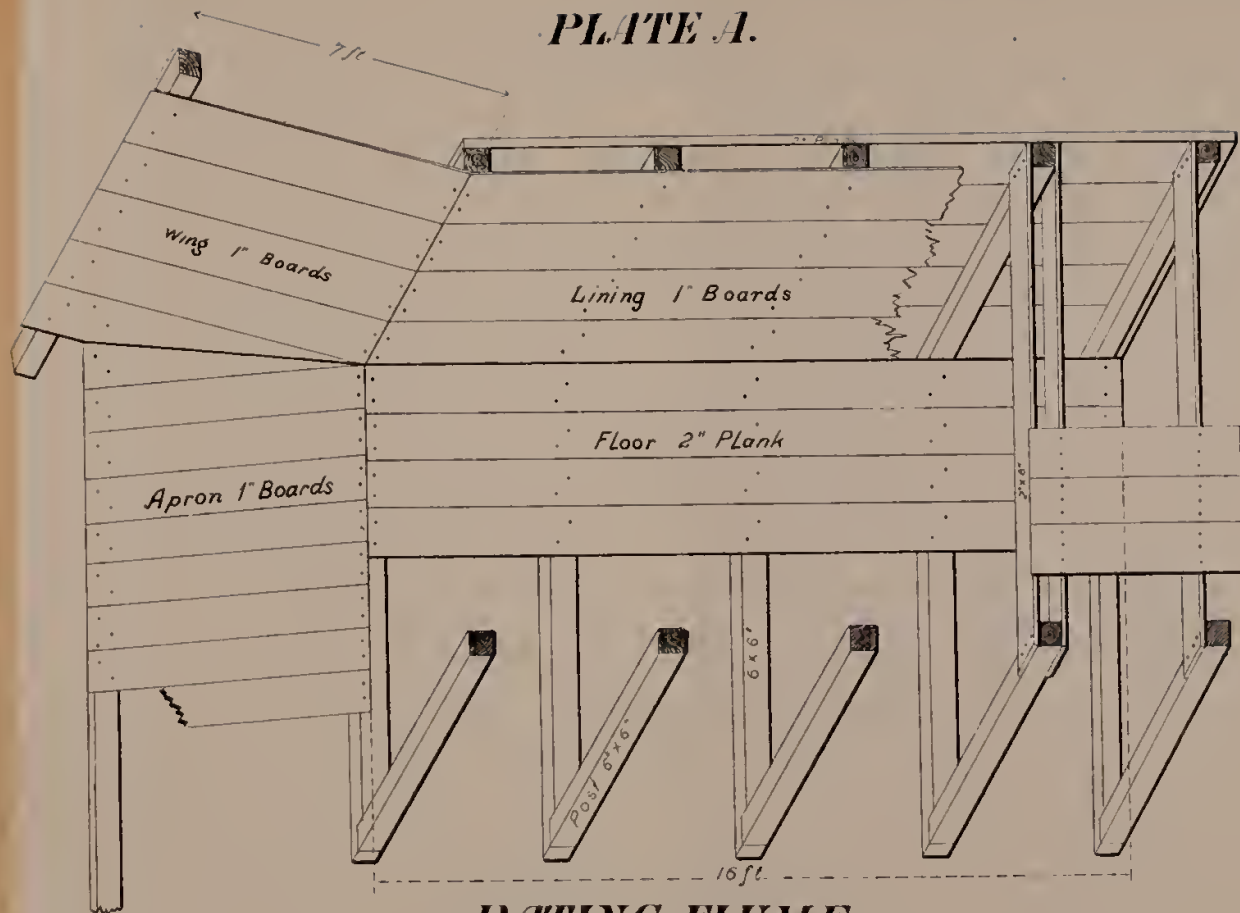
with the ditch, on the grade thereof, and of sufficient height to carry the greatest amount of water likely to enter therein.

The rapidity and correctness with which water commissioners can perform their duty of distributing the water from the streams into the ditches is greatly facilitated by the construction of these flumes. And the commissioners were instructed to urge the proprietors of each ditch to construct them. As soon as practicable after such construction the flumes were rated by the State Engineer or his assistants, in the same manner as that described for measuring the flow of streams, and the water commissioner furnished with a table showing the quantities of water which would flow through the flume at various depths.

Armed with this table and the decree of his district, the commissioner had but to raise the head gate of a ditch until that depth of water corresponding to the quantity of water to which it was entitled, was reached in the flume. It was found, by reason of changes in the grade or form of the ditches, occasioned by the deposit of sediment or washing of the banks or bed, that frequent ratings of ditches became necessary. Ditches previously rated were re-rated in 1887 and 1888, as they will have to be next year, and the year after, and until some more elaborate and expensive device is used. On account of these changes, the tables of ratings are not published in the report, but it is the custom of the office to furnish any person desiring it with a copy of the last rating of any ditch. A list of the ditches rated in each district will be found in the chapters devoted to the division in which the district is situated.

Much additional labor was occasioned the water commissioners by reason of the refusal on the part of many of the owners of ditches to comply with that section of the law just mentioned, and to a failure to comply with

# PLATE A.



## RATING FLUME

For ditches exceeding Six feet in width,  
 Scale  $\frac{1}{4}$  Inch = 1 Foot.





which there unfortunately attaches no penalty. In such cases the commissioners were at a loss to know how to measure the water to be allotted to the ditches. They began to make inquiries of this office in relation thereto, and numerous demands for the same information were received from ditch owners. The impossibility of writing full and satisfactory replies to each enquirer led to the issuing of an addition of five hundred copies of a pamphlet on the flow of water in ditches. As this edition has been long since exhausted, and as the demand for just such information as it contained is as great as ever, it is inserted below, that it may in the distribution of this report, continue to be of service.

## Remarks on the Flow of Water in Ditches.

OFFICE OF THE STATE ENGINEER,  
DENVER, COLO., February 1, 1888. }

In order to meet readily the many applications made to me by superintendents of irrigation, water commissioners and others, for formulas and directions that will enable them to determine the carrying capacity of ditches in *cubic feet per second*, I have prepared for publication and distribution the following

### REMARKS ON THE FLOW OF WATER IN DITCHES.

A *cubic foot per second* is the *unit of measurement* adopted in the distribution of water from the natural streams of Colorado into the ditches. The greatest number of these *units of measurement* that a ditch can be *safely* made to carry, is termed the capacity of the ditch.

A *cubic foot of water* is that quantity of water which a vessel one foot in length, depth and width will contain

when filled. It is equivalent to about seven and one-half gallons.

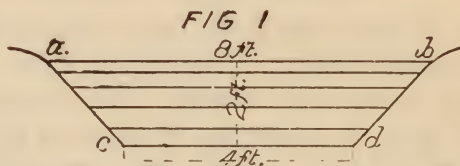
One *cubic foot per second* is the capacity of a ditch that can exactly fill such a vessel each second of time.

Ten *cubic feet per second* is the capacity of a ditch which can exactly fill such a vessel ten times in each second of time.

The quantity of water which a ditch carries, expressed in cubic feet per second, may be obtained by multiplying the area of the wet cross-section of the ditch, expressed in square feet, by the mean velocity of the water at the cross-section selected, expressed in feet per second.

This would be algebraically stated by the equation  $Q = Fv$ , in which  $Q$  represents the quantity of water carried,  $F$  the area of the wet cross-section, and  $v$  the mean velocity of the water.

Figure 1 represents the cross-section of a ditch, which means a vertical section at right angles to the course of the ditch.



That part of the cross-section below the high water line,  $a-b$ , is the wet cross-section.

The area of the wet cross-section in square feet may be obtained by multiplying the average width thereof, in feet, by the depth, in feet.

Thus, the average width of the wet cross-section of ditch shown in figure 1, is  $\frac{8 \text{ feet} + 4 \text{ feet}}{2} = 6 \text{ feet}$ , and the depth is 2 feet, so that the area becomes  $6 \text{ feet} \times 2 \text{ feet} = 12 \text{ square feet}$ .\*

\*Let it be remembered that the product of *feet* multiplied by *feet* is *square feet*, and that the product of *square feet* multiplied by *feet* is *cubic feet*.

If the mean velocity of the water in this ditch, were 2 feet per second the quantity of water carried would be  $12 \text{ square feet} \times 2 \text{ feet per second} = 24 \text{ cubic feet per second}$ . If the mean velocity were 2.5 feet per second, the quantity carried would be 30 cubic feet per second. This difference of 6 cubic feet per second, which is sufficient water to irrigate some 350 acres as water is now used by us, is occasioned by a small difference in the mean velocity of the water, and indicates that great care should be used in determining that mean velocity.

The mean velocity of the water carried by a ditch may be determined, either by actual measurement of the velocity of the water flowing in the ditch, or by the use of formulas. Formulas are simply rules expressed algebraically. They are based upon the results of many observations and experiments, and give the equivalent of the mean velocity in some algebraic form, involving, among other functions, the area and shape of the wet cross-section, and the grade of the ditch.

In connection with the actual measurement of the velocity of the water, let it be borne in mind that the water does not move with equal velocities at all points of the cross-section, but that, as a rule, the velocity increases from the sides towards the center of the channel, and from the bottom upwards to a point a little below the surface of the water.

By the *mean velocity* is meant that certain velocity which, if common to all the threads of water, would produce the same discharge as that occasioned by the varying velocities which actually exist; or, in other words, it is the average of the velocities of all of the threads of water passing through the cross-section.

There are many methods, more or less convenient, of measuring the mean velocity of water flowing in a ditch. The best, and the one adopted by this department in rating measuring flumes, is that in which a current

meter is used. The current meter is a machine which registers the number of revolutions which a vaned wheel, when submerged in running water, makes in any observed number of seconds. The number of revolutions divided by the observed number of seconds, gives the number of revolutions of the vaned wheel per second. As the meter, before being used, has been rated, so that the velocity corresponding to any number of revolutions per second of the vaned wheel is known, it follows that by its use the velocity of the water at any point of the cross-section can become known. The average of the velocities obtained by a number of observations at the proper points, will give the mean velocity of the water through the entire cross-section. Other devices, such as Pitot's tube, the hydrometric pendulum, and the rheometer—found described in works on hydraulics—are used in the same general way. But these devices are expensive, and not always attainable.

A method of ascertaining the amount of water flowing in a ditch, which consists in determining by floats the *maximum surface velocity* of the water, taking a certain per centum thereof for the mean velocity of the water, and multiplying the mean velocity so obtained by the area of the wet cross-section, is of very easy application. It is, perhaps, on the whole, the most suitable method for the use of those to whom these remarks are especially addressed, namely, the water commissioners of the State, who, by reason of the negligence of ditch owners to construct rating flumes in their ditches, in compliance with the law, are compelled to make hasty estimates of the amount of water carried by these ditches, when engaged in distributing the water of the natural streams in conformity with the decrees of the District courts.

To obtain the maximum surface velocity, select a portion of the ditch, near its head, which is free from



weeds, and from eddies, still water and other irregularities, and which is as nearly straight and of uniform cross-section as can be obtained for, say a distance of one hundred and twenty-five feet; then lay off a line one hundred feet in length, parallel and adjacent to this part of the ditch, mark the ends of the one hundred foot line by stakes; use for a float a chip, or small block of wood, of such form as not to catch the wind or project far below the surface; cause the float to remain in the swiftest current throughout its course; place it in the current some distance above the upper end of the one hundred foot line, so that it will have acquired the velocity of the water by the time it reaches that point; start the stop-watch, or note the time, when the float passes the upper end of the one hundred foot line, and stop the stop-watch, or again note the time when the float passes the lower end of the one hundred foot line; one hundred feet, divided by the number of seconds it took the float to run that distance will give the velocity of the float in *feet per second*. (Illustration: If it took 25 seconds for the float to run 100 feet, the float would run  $\frac{100}{25} = 4$  feet per second; if forty seconds were required for it to run 100 feet, its velocity would be  $\frac{100}{40} = 2.5$  feet per second). Repeat this operation several times in order to be positive that the *maximum surface velocity* has been obtained.

In order to determine what per centum of the *maximum surface velocity* to take as the mean velocity of the entire cross-section, considerable judgment is required, for no universal rule can be laid down. European engineers seem to take 83 per cent. of the maximum surface velocity for the mean velocity, while many American engineers regard 80 per cent. as sufficiently large. Speaking in a general way in this connection, and with reference to our ditches as constructed in Colorado, I should say, make the mean velocity 80 per cent. of the

maximum surface velocity, where the ditches are shallow and narrow, and 83 per cent. where they are deep and broad.

EXAMPLE.—The wet cross-section of a ditch is 8 feet wide on the bottom, 10 feet wide on top, and 1 foot deep, and the maximum surface velocity is 2.2 feet per second. What is the capacity,  $Q$ ?

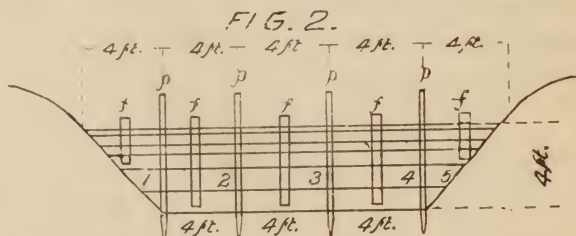
Formula,  $Q = F \times v$ .

$$F = \frac{8 \text{ feet} + 10 \text{ feet}}{2} \times 1 \text{ foot} = 9 \text{ square feet.}$$

$$v = 80\% \text{ of } 2.2 \text{ feet per second} = 1.76 \text{ feet per second.}$$

$$F \times v = 9 \text{ square feet} \times 1.76 \text{ feet per second} = 15.84 \text{ cubic feet per second} = Q.$$

Another method of determining the capacity of a ditch, by running floats, is indicated in Figure 2:



Select a portion of the ditch similar to that described above, and stake out the 100-foot line parallel and adjacent thereto. A cross-section about the center of the 100-foot line is subdivided into sections by means of poles set as those designated *p. p. p. p.* in Figure 2. The floats used in this method, designated *f. f. f. f. f.*, in Figure 2, are of tin or wood. If of wood, they are of different lengths, and if of tin, they have screw joints so as to be lengthened or shortened at pleasure. Select a float of such a length and so weighted that the lower end will just miss the bottom and the upper end just project above the surface, when it is caused to run down the center line of the section, the mean velocity of the water through which it is proposed to determine.

The observed velocity of the float, obtained in the same way as indicated for surface floats, is considered the *mean velocity* of the water in that section down the center line of which the float traveled. The mean velocity of the water in each section of the cross-section is thus determined. In place of taking the average of the *mean velocities* thus obtained as the *mean velocity* of the entire cross-section, and multiplying the area of the cross-section, thereby to obtain the discharge of the ditch, it has been found better to calculate the discharge through each section of the cross-section, and add them together for the total discharge. The discharge through each section is the product of the area of that section by the mean velocity of the water through it.

## EXAMPLE:

What quantity of water is carried by a ditch with a wet cross-section 12 feet wide on the bottom, 20 feet wide on top, and 4 feet deep, when, if divided into five sections, as shown by Figure 2, the mean velocity in sections 1 and 5 is 1.6 feet per second; in sections 2 and 4, is 2.0 feet per second; and in section 3, is 2.4 feet per second?

## SOLUTION:

The discharge through section 1= 8 square ft.  $\times$  1.6 ft. per sec.=12.8 cu. ft. per sec.

The discharge through section 2=16 square ft.  $\times$  2 ft. per sec.=32.0 cu. ft. per sec.

The discharge through section 3=16 square ft.  $\times$  2.4 ft. per sec.=38.4 cu. ft. per sec.

The discharge through section 4=16 square ft.  $\times$  2 ft. per sec.=32.0 cu. ft. per sec.

The discharge through section 5= 8 square ft.  $\times$  1.6 ft. per sec.=12.8 cu. ft. per sec.

Total quantity of water carried by ditch . . . . . 128.0 cu. ft. per sec.

In a flume, when the depth of water is three-fourths or more of the width, the mean velocity will quite equal the maximum surface velocity, or may even exceed it.

Of the many formulæ, submitted by engineers, for determining the discharge of ditches without actually measuring the velocity of the water, Kutter's is the best, and is recommended to engineers. It is, however, intricate and lengthy, and is not considered as suitable for this article as the one herein following, which has long

ranked among the few good ones, though when applied to small ditches the results are apt to be too large.

But neither this nor any other formula, it may be observed, takes into direct consideration great irregularities in the bed of the ditch, or very sudden changes in its course. These conditions need not, however, be neglected. Experience will enable one to allow for them with considerable accuracy by increasing correspondingly the co-efficient of resistance that would otherwise have been used.

Without discussing the theory of the flow of water in ditches, which though it might tend to an appreciation of the formula, would not materially aid in explaining its use, attention is at once directed to the consideration of the following equations and the accompanying table of co-efficients of resistance, taken from Weisbach's Mechanics:

$$\text{Equation 1. } v = 92.26 \sqrt{\frac{Fh}{pl}}$$

$$\text{Equation 2. } v = \sqrt{\frac{F}{z \cdot lp}} \cdot 2gh$$

$$\text{Equation 3. } Q = Fv.$$

TABLE OF CO-EFFICIENTS OF RESISTANCE.

Mean velocity in feet per second.	Corresponding co-efficient of resistance.
$v=0.3$	$z=0.01215$
$v=0.4$	$z=0.01097$
$v=0.5$	$z=0.01025$
$v=0.6$	$z=0.00978$
$v=0.7$	$z=0.00944$
$v=0.8$	$z=0.00918$
$v=0.9$	$z=0.00899$
$v=1.$	$z=0.00833$
$v=1.5$	$z=0.00836$
$v=2.$	$z=0.00812$
$v=3.$	$z=0.00788$
$v=5.$	$z=0.00769$
$v=7.$	$z=0.00701$
$v=10.$	$z=0.00755$
$v=15.$	$z=0.007504$

In these equations:

$F$ —the area of the wet cross-section in square feet.

$p$ —the length of the wet perimeter of the cross-section in feet. By the wet perimeter is meant that part of the perimeter of the cross-section which is covered by water, as  $a$ ,  $c$ ,  $d$ ,  $b$  in Figure I.



$h$ =the fall of the ditch, corresponding to any given portion of the length thereof, which portion of the length is designated by  $l$ . Thus, if the fall of the ditch is three feet in a mile,  $h=3$  feet, and  $l=5280$  feet.

$z$ =the co-efficient of resistance. The co-efficient of resistance changes with the velocity. The co-efficient of resistance corresponding to any velocity will be found immediately opposite that velocity in the table above given. Thus, the co-efficient of resistance corresponding to a velocity of three feet per second, is found from the table to be 0.00788.

$$g=32.2.$$

$v$ =the mean velocity of the water in feet per second.

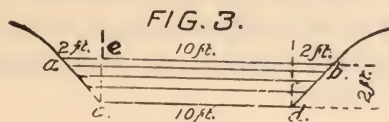
$Q$ =the quantity of water carried in cubic feet per second.

It will be noticed from the table, that as the velocity increases, the co-efficient of resistance decreases. The velocity must be quite approximately known before the co-efficient of resistance can be determined. A solution of equation 1 gives us the mean velocity,  $v$ , of the ditch quite accurately, and knowing this approximate value of  $v$ , the corresponding value of  $z$ , the co-efficient of resistance, is obtained from the table as explained. Substituting this value of  $z$  and the values of the other functions,  $F$ ,  $h$ ,  $l$ ,  $p$  and  $g$ , in equation 2, and solving the equation, we obtain the true value of the mean velocity  $v$ ; multiplying this value of  $v$  by the value of  $F$ , we get, as indicated by equation 3, the quantity of water  $Q$  carried by the ditch.

#### EXAMPLE:

What quantity of water is carried by a ditch, having a wet cross-section 10 feet wide on the bottom, 14 feet wide on top, and 2 feet deep; the fall of the ditch being 4 feet to the mile?

Figure 3 represents the wet cross-section of this ditch.



$$F = \frac{14 \text{ ft.} + 10 \text{ ft.}}{2} \times 2 \text{ ft.} = 12 \text{ ft.} \times 2 \text{ ft.} = 24 \text{ sq. ft.}$$

$$h = 4 \text{ ft.}; l = 5280 \text{ ft.} = 1 \text{ mile.}$$

$$p = ac + cd + db^* = 2.828 \text{ ft.} + 10 \text{ ft.} + 2.828 \text{ ft.} = 15.656 \text{ feet.}$$

$$\begin{aligned} \text{By equation 1, } v &= 92.261 \sqrt{\frac{24 \times 4}{15.656 \times 5280}} = 92.261 \sqrt{\frac{96}{82664}} \\ &= 92.261 \sqrt{.001161} = 92.26 \times .034 = 3.137 = \text{approximate velocity.} \end{aligned}$$

By an examination of the table we find the coefficient of resistance,  $z$ , corresponding to the approximate velocity 3.137, would be a little less than 0.00788, which corresponds to a velocity of 3 feet. Take in this case .00787 as the value of  $z$ .

$$\begin{aligned} \text{Substitute the known values in equation 2, and we have} \\ v &= \sqrt{\frac{24}{.00787 \times 15.656 \times 5280} \times 64.4 \times 4} = \sqrt{\frac{6182.4}{650.56}} = \sqrt{9.5032} \\ &= 3.082 \text{ ft. per second.} \end{aligned}$$

$$\text{Then, by equation 3 we have } Q = F \times v = 24 \times 3.082 = 73.97 \text{ cubic ft. per second.}$$

EXAMPLE 2.—What quantity of water will be carried by a ditch 40 feet wide, whose mean depth is 4.5 ft., and wet perimeter 46 ft., when it falls 10 in. in 750 ft.?

$$\begin{aligned} \text{By equation 1, } v &= 92.261 \sqrt{\frac{40 \times 4.5 \times 10}{46 \times 750 \times 12}} = \frac{92.26}{\sqrt{230}} = 6.1 \text{ ft.} \\ \text{per sec.} &= \text{approximate velocity. The corresponding value of } z \text{ is .00765.} \end{aligned}$$

$$\begin{aligned} \text{Then, by equation 2, we have:} \\ v &= \sqrt{\frac{4.5 \times 40 \times 10}{.00765 \times 46 \times 750 \times 12} \times 64.4} = 6.05. \end{aligned}$$

$$\text{And by equation 3 the quantity of water carried } Q = Fv = 4.5 \times 40 \times 6.05 = 1089 \text{ cu. ft. per second.}$$

\*To get the distance  $ac$ , add together the square of  $ac$  and the square of  $ec$ , and take the square root of the sum. Thus  $2^2 + 2^2 = 4 + 4 = 8$ , and the square root of 8 is 2.828.

CAUTION.—Do not attempt to multiply feet by inches. The product would neither be sq. ft. nor sq. in. Notice that in the second example 10 in. is treated as  $\frac{1}{12}$  of a ft., and so designed.

In the distribution of water by water commissioners, to those ditches not supplied with rating flumes, it usually happens that the quantity of water a ditch is found, upon measurement, to be receiving from the natural stream, is less or more than it is entitled, under the decree of the District court, to draw. Under these circumstances, a formula that will indicate the depth to which to increase or decrease the water so as to allot to the ditch its proper quantity, will be of service.

$\frac{Q_1 - Q}{Q} = \frac{3}{2} \times \frac{a_1 - a}{a}$  is such a formula. It is approximately correct only. It is more nearly correct for wide ditches with slightly sloping banks, than for others.

In this formula:—

$Q_1$  represents the measured quantity of water carried by the ditch.

$a_1$  represents the depth of the water at the time the ditch carried the measured quantity  $Q_1$ .

$a_1$  was determined in measuring the cross-section of the ditch to get  $Q_1$ .

$Q$  represents the quantity of water to which the ditch is entitled under the decree.

$a$  is the depth of water in the ditch when the quantity carried therein is  $Q$ .

#### EXAMPLE:

Upon measuring a ditch, entitled to draw 72 cu. ft. per sec., it was found to be drawing 82 cu. ft. per sec., and that the depth of the water was 2.185 feet. To what depth should the water be reduced in order that it might carry its proper quantity?

Substitute in the formula the known values of  $a_1$ ,  $Q_1$ , and  $Q$ , and we have  $\frac{8 \cdot 2 \cdot 7 \cdot 2}{7 \cdot 2} = \frac{3}{2} \times \frac{2 \cdot 1 \cdot 8 \cdot 5 - a}{a}$  or  $\frac{1 \cdot 0}{7 \cdot 2} = \frac{3}{2} \times \frac{2 \cdot 1 \cdot 8 \cdot 5 - a}{a}$  or  $10a + 108a = 236$ , or  $118a = 236$ , or  $a = 2$  ft. = answer.

## EXAMPLE:

If the ditch just above described were found to be carrying only 62 cu. ft. per sec., and the corresponding depth of water was found to be 1.8148 ft., what would be the depth of water corresponding to 72 cu. ft. per second?

Substitute in the formula the known values of  $a_1$ ,  $Q_1$ , and  $Q$ , and we have  $\frac{6 \cdot 2 \cdot 7 \cdot 2}{7 \cdot 2} = \frac{3}{2} \times \frac{1 \cdot 8 \cdot 1 \cdot 4 \cdot 8 - a}{a}$  or  $-10a = 196 - 108a$ , or  $98a = 196$ , or  $a = 2$  = ans.

It is readily seen that when the quantity of water carried, and the corresponding depth of water are known, the quantity carried at any other known depth, or the depth corresponding to any other known quantity, are readily determined, at least approximately, by this formula.

Besides serving as a reply to letters of inquiry that could not otherwise be fully answered, without encroaching too much on more important duties, it is hoped for this paper:—

That it may be the means of securing a more expeditious and accurate distribution of the water of the natural streams by water commissioners.

That it may be of service to referees of the district courts in making out their decrees, and to those preparing ditch statements for record or filing in the offices of the clerks of the District court, or those of the county clerks, or that of the State Engineer.

That, by reason of its issue, there may be fewer inconsistencies between the given dimensions of ditches and their capacities in the decrees and statements of the future than in those of the past.

And, in conclusion, that it may add something to the general progress of irrigation in this State, the welfare of which is so largely intrusted to this department.

It may be well to supplement at this time the above *remarks* by giving the formula of *Kutter*, mentioned as intricate and lengthy but the best. It is given, however, without amplification, and more as an endorsement of its merits, to the end that it may be more generally adopted throughout the State by surveyors and engineers. In *Kutter's* formula for open channels\*, the fall of the surface in a unit of length is called the slope, and the ratio of the area of the wet cross-section to the wet perimeter, *i. e.*  $\frac{\text{area of wet cross-section}}{\text{wet perimeter}}$ , is called the hydraulic radius, mean depth or mean radius.

The mean velocity of the water = co-efficient "C"  $\times \sqrt{\text{mean radius} \times \text{slope}}$ . The co-efficient "C" depends upon the size, shape, slope and roughness of the channel, and is for English measures = 
$$\frac{41.6 + \frac{.00281}{\text{slope}} + \frac{1.811}{n}}{1 + \frac{(41.6 + \frac{.00281}{\text{slope}}) \times n}{\sqrt{\text{mean radius in feet.}}}}$$

where *n* is a co-efficient of roughness of the sides and bottom of the channel, and has for channels subject to irregularity of cross-section the following values, viz:

For canals in very firm gravel . . . . .	.020
For canals and rivers of tolerably uniform cross-section, slope and direction, in moderately good order and regimen, and free from stones and weeds . . . . .	.025
For canals having stones and weeds occasionally . . . . .	.030
For canals in bad order and regimen, overgrown with vegetation, and strewn with stones and detritus . . . . .	.035

It having become apparent that men were sometimes recommended for the position of water commissioner, or that of superintendent of irrigation, who were not qualified therefor, and who would not have desired the posi-

\* See *Trantwine's Engineer's Pocket-Book*; *Hydraulic Manual*, Jackson; *Hydraulic Tables, Co-efficients and Formulas*, Neville, for a discussion of *Kutter's* Formula.



tion had they known what duties would be required of them, it was determined to submit to applicants questions similar to those contained in the following letter, which, with slight variations, were sent to those recommended for appointment for the positions mentioned :

STATE ENGINEER'S OFFICE, }  
DENVER, COLO., . . . . 1888. }

. . . . .

*Dear Sir*—You have been recommended to the Governor for appointment as water commissioner of District No. . . . . The Governor desires, before making the appointment, to be assured of your qualifications for the position so far as the necessary technical information is concerned. To that end, as is customary, you are asked to look over the little work\* which accompanies this letter, familiarize yourself with the first nine pages thereof, if you are not already posted in such matters, and reply to the following questions :

*Question 1.* How can the maximum surface velocity of the water in a ditch be determined ?

*Question 2.* In what ways can the mean velocity of the water in a ditch be determined ?

*Question 3.* What is the area of the wet cross-section of a ditch which is six feet wide on the bottom, has its banks sloping at an angle of one to one or  $45^{\circ}$  and carries water to the depth of two feet ?

*Question 4.* What is the mean velocity in a ditch, when the maximum surface velocity thereof is three-fourths of a foot per second ?

*Question 5.* If a ditch is twenty feet wide on the bottom, has its banks sloping at an angle of  $45^{\circ}$ , and carries water to the depth of four feet, with a mean velocity of four feet per second, how many cubic feet of water per second will the ditch carry ?

*Question 6.* What is the capacity of a ditch which is twelve feet wide on top, ten feet wide on the bottom and one foot deep, when the maximum surface velocity of the water is three feet per second ?

\*The "little work" referred to, was the pamphlet entitled : "Remarks on the Flow of Water in Ditches," just given.

I also mail you a copy of the laws and regulations governing water commissioners in the distribution of water from the natural streams of Colorado.

Very respectfully,

.....  
State Engineer.

As the water commissioners increased their knowledge of the methods of measuring water and became more expert in estimating the discharge of a stream or canal, it was deemed advisable to have them report in a more exact manner, than had heretofore been possible, the condition of their districts. And as the demand for water began to greatly exceed the supply, and it became necessary to distribute the water to ditches in accordance with their priority in the division and without reference to the district in which they were situated, and to take prompt advantage of flood waters so that nothing be lost, it was seen to be desirable to have the commissioners report frequently and keep the superintendents posted as to their whereabouts, that they might if necessary be instructed by telegraph. These considerations led to the preparation of *blank forms*, with which the water commissioners were furnished, and which they were instructed to fill out and send to the superintendent at brief intervals, and as occasion would seem to demand, during the season. The following is a copy of the form used :

..... COLORADO ..... 188 ..  
In Water District No. . . .  
Superintendent of Irrigation,  
Water District No. . . .  
..... Colorado.

Dear Sir—The total amount of water necessary to supply all of the ditches, so as to actually irrigate the land cultivated, in this district is, at the present time, . . . . . cubic feet per second.

The amount of water actually coming into the district is, at this date, . . . . . cubic feet per second.

This amount is only sufficient to supply ditches having a priority antedating . . . . . and seems to be . . . . .

The . . . . . ditch is the latest ditch receiving water, and the amount distributed to it is . . . . . cubic feet per second.

Instructions will reach me at . . . . . at . . . . . o'clock . . m.

. . . . . and at . . . . . at . . . . . o'clock . . m.

The amount of water flowing from this district into District No. . . . is . . .  
cubic feet per second.

Remarks:

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

*Water Commissioner District No .*

## ARTESIAN WELLS.

It was not until the season of 1888 that attention was directed to the collection of statistics concerning artesian wells. Up to June 1 of that year not a single artesian well statement had been filed in this office, in compliance with the enactment of the General Assembly relative to artesian wells, approved April 4, 1887. It was seen that some steps must be taken to secure a compliance with the law and the collection of this valuable information, and though no further duty in this matter seemed to devolve upon the State Engineer than the simple filing of these statements when presented at this office, yet such encouragement to file such statements as could be given without interfering with other duties would appear to be a service that might be expected from this department, and as information concerning our source of water supply from artesian wells was beginning to be sought after, it was determined to give such aid in this direction as was possible. An examination of the enactment concerning artesian wells showed that a simple compliance with the requirements of the act would afford but very meagre information concerning the wells. It was determined then to urge upon well owners not only a compliance with the absolute requirements of the law, but also with a request from this department for other but pertinent information concerning their wells. A sample of the artesian well statements, with the accompanying request, is given below:

## STATE ENGINEER'S REPORT.

## ARTESIAN WELL STATEMENT.

STATE ENGINEER'S OFFICE,  
DENVER, COLO., June 1, 1888. }

DEAR SIR—Will you kindly fill out as completely as possible, and return to me, the following blank concerning . . . . . artesian well.

State Engineer.

COLO., . . . . . 1888.

To the State Engineer,  
Denver, Colorado:

DEAR SIR—In compliance with the above request, and with the enactment of the General Assembly relative to artesian wells, approved April 4, 1887, I herewith hand you statement concerning the artesian well known as the. . . . . Said well is the property of. . . . ., whose post-office address is. . . . . It was sunk by. . . . ., contractor, whose post-office address is. . . . . Work thereon was commenced. . . . ., and completed. . . . . The diameter of the casing thereof is. . . . . The well is cased to a depth of. . . . . feet, and the casing rests upon. . . . . The well is located in Sec. . . . . Tp. . . . ., Range. . . . . county, Colorado. The well has been sunk to a depth of. . . . . feet, in which distance water-bearing seams were cut at a depth of. . . . . and. . . . . feet. The first flow was obtained at a depth of. . . . . feet, and was. . . . . gallons per minute. The second flow was obtained at a depth of. . . . . feet, and was. . . . . gallons per minute. The third flow was obtained at a depth of. . . . . feet, and was. . . . . gallons per minute. The fourth flow was obtained at a depth of. . . . . feet, and was. . . . . gallons per minute. The last flow was obtained at a depth of. . . . . feet, and was. . . . . gallons per minute at the time of the completion of the well; it is now. . . . . gallons per minute. The pressure at the surface, at the time of the completion of well, was. . . . . pounds per square inch; it is now. . . . . pounds per square inch.

From the surface the bore passed through:

Surface wash for. . . . . for. . . . . feet.  
Then through. . . . . for. . . . . feet, etc., etc.

Water from the. . . . . foot level came within. . . . . feet of the surface.

The temperature of the water at first flow was. . . . . degrees; at second flow, . . . . . degrees; at third flow. . . . . degrees. . . . . at last flow. . . . . degrees. The analysis of the water now (or last) flowing from the well is as follows: . . . . .

The altitude of the well at the surface is. . . . . feet . . . . .

## REMARKS.

Yours respectfully,

Owner of well.

Contractor.

With the object of securing statements of all the wells in the State, the following clause was inserted in the instructions issued to superintendents of irrigation and water commissioners, July 1, 1888, viz: "Each



superintendent of irrigation will be supplied, on application to the State Engineer, with blank artesian well statements, which he will present either in person or through his water commissioners to the contractor or owner of each artesian well in his division. And he will endeavor to have a statement of each artesian well in his division filed in the State Engineer's office on or before August 15, 1888." With this, as with the many other requests made, the superintendents and commissioners complied readily and most pleasantly, and notwithstanding the many additional labors thrown upon them during the past two years, when their anxieties and cares were greater than in any previous year, by reason of the scarcity of water, there was never any hesitancy shown in attempting to comply with the requests from this office, or aiding in any way within their power the efforts to advance the cause of irrigation.

The tabulated statements relative to artesian wells will be found in the chapters of the report devoted to the different water divisions, each statement falling under the head of the water district in which the well is situated, if in a water district, otherwise in a miscellaneous table for wells in the division but in no district.

### WATER FOR DOMESTIC USE.

Perhaps the most serious questions in connection with the distribution of water, which this department has ever been called upon to meet, were those connected with the apportionment to the ditches, of water for domestic purposes. When, in the early part of 1888, a very limited supply of water for the season was foreseen, from the reports concerning the extremely light snow-fall in the mountains, kindly made by residents near the summits of the ranges, in response to requests from this office, it was evident that the department would be forced to adopt a policy in this matter. The possible positions



open to the department, and the reasons for adopting the one chosen, are set forth in a letter to superintendents of irrigation and water commissioners, which is found herein following.

Lest there might be reasons which had been overlooked, that could be presented, showing that the position it was believed preferable to take was unwise, it was decided that the orders relative to the distribution of water for domestic purposes be issued first by the superintendent of irrigation of that division in which the greatest concern in reference to the subject was observable, thus giving an opportunity to those feeling themselves injured by the order, to appeal the matter to the State Engineer, and affording that officer, in case of an appeal, further opportunity of considering the arguments for and against the position, before the issuing of a general order relative thereto, and addressed to the water commissioners throughout the State.

Following is Order No. 1, addressed to the water commissioners of Water Division No. 1, issued from his office in Denver, on April 20, 1888, by Mr. Timothy O'Connell, superintendent of irrigation of that division:

"Water commissioners in Water Division No. 1, are hereby instructed to distribute no water to any ditch in their districts for domestic use, unless the decree of the District court governing them in this matter shall set forth that the ditch in question is entitled to water for that purpose. Water commissioners in Water Division No. 1, will notify any person, ditch company or ditch owner feeling himself aggrieved, injured or discriminated against by this order that he has the right to appeal from the same to the State Engineer by filing with the State Engineer a copy of the order complained of and a statement of the manner in which the same injuriously affects the petitioner's interest."

This order was sent to each commissioner of Division No. 1 by the superintendent, and accompanied by a list, prepared by him, of the ditches in the district of each

commissioner, of which mention was made in the decree that they had been constructed for the purpose of carrying water for domestic use, as well as for irrigation or mechanical purposes, and by directions to distribute water to the ditches included in the list for domestic purposes. But the interpretations thus placed on the decrees being at once called in question, the following order was issued by Mr. O'Connell on the 26th of the same month:

"Order No. 2 (relative to water for domestic use): After mature consideration of the decrees of the District courts, governing the appropriations of water in the water districts of Water Division No. 1, in some of which there are, apparently, at least, conflicts between the 'decretal order' and subsequent 'orders of the decree,' water commissioners in Water Division No. 1 are hereby instructed: That no claim of priority of any person, association or corporation to water for domestic use, on account of any ditch, canal or reservoir, shall be regarded by any water commissioner in distributing water in times of scarcity, until a certificate, under seal of the proper court, and setting forth the date or dates and amount or amounts of appropriations adjudged in favor of such ditch for domestic use, shall have been issued to the claimant and presented to the water commissioner."

The result of these steps is indicated in the following

**Letter to Superintendents of Irrigation and Water Commissioners  
in Relation to the Distribution of Water for Domestic Use.**

STATE ENGINEER'S OFFICE, }  
DENVER, COLO., August 22, 1888. }

*Gentlemen*—You are, of course, familiar with the provisions of the Constitution of the State relative to the diverting of waters of the natural streams for domestic use and with the constant claims thereunder set up to water for that purpose.

In this connection your attention is called to the following facts: There is no law directly requiring you to

distribute water for domestic use; there has been no legislative declaration of the meaning, nor judicial construction of the term domestic use; and the legislature has failed to enact laws providing for the adjudicating and settling of questions connected with the right to the use of water for that purpose, consequently neither the dates nor the amounts of appropriations for that purpose have been determined.

You are aware that, in the spring of this year, it devolved upon this department to take one of two positions: either to assume the power of determining the amount of water to be allowed to the various ditches for domestic use, and distribute thereto the amount so determined upon, or to insist upon distributing the waters of the streams for irrigation only.

The latter alternative was chosen through a desire to avoid so great a responsibility as the first position would have involved, and for the following reasons: It was believed that thereby the matter could be the more readily brought before the courts and their guidance secured; it was strictly in conformity with the laws directly setting forth your duties; and it tended more effectively to the promotion of the general welfare, and this because canals constructed for irrigation are not adapted to carrying, without great waste, the quantity of water required to supply the needs for domestic purposes solely of the people under them.

You remember that, in conformity with this position, orders were issued to the water commissioners of Division No. 1, virtually directing them to distribute no water for domestic use solely. Almost immediately thereafter several ditch companies, not entitled to water for irrigation, set up their necessities to water for domestic use, and sued out injunctions to have the water of the stream allowed to flow into their ditches for that use: Thereupon the court granted a temporary injunction and commanded the water commissioner to allow so much water as was necessary for domestic use to run from the stream into the plaintiffs' ditches.

The readiness with which injunctions were granted, compelled this department to direct the commissioners to hold the orders relative to the distribution of water for domestic use in abeyance until further notice.

The test cases, which had thus been secured, coming up for hearing, the court decided that, as a matter of law, the right to divert water for domestic use is a preferred right, and that the method of diverting the water is not material. Subsequently, and recently, several of these cases having been brought again before the court, this time for a hearing upon their merits, and it having been shown that a very great waste of water, which means a very great loss of wealth to the people of the State, was occasioned by supplying water for domestic use solely through irrigation ditches, the court so modified its former commands as to grant water for domestic purposes solely, for a portion of each week only. The assumption being that water needed for domestic purposes during the balance of the week could be stored at the time water was furnished. The inference to be drawn from these decisions and from the commands of the court to the water commissioner is that this department should allow to the various ditches, so demanding it, water for domestic use to the extent of the necessities of the parties using water therefrom for that purpose; which, pending further decisions or legislative action, will be done.

This involves on our part, until decided by higher authority, a determination of the meaning of the term "domestic use," and a determination of the amount of water for that use to be allowed to the various ditches, and of the length of time during each week in which water shall be so allowed thereto, except as to those ditches relative to which injunction orders have been issued.

It is evident that there should be, as nearly as possible, uniformity in the distribution of water for domestic use throughout the State, and that this department should carefully avoid in this matter the establishment of precedents which may in time become customs, and complicate unnecessarily our irrigation laws, or prejudice the agricultural interests of the State. Therefore, I have prepared this letter of instructions and suggestions, which, with the utmost conservatism, follows the guidance of the court. And I put a rigorous interpretation, for your guidance, upon the term "domestic use," and have decided, until further light is afforded, and so far



as my authority goes, that "water for domestic use" shall mean the water which is needed for the usual household purposes and the use of domestic animals, and shall not embrace irrigation to any extent whatever.

It is readily recognized that the unrestricted compliance with every demand for water for domestic use, or that the permitting of a ditch, not entitled to draw water for irrigation, to use for irrigation the water which is allowed for domestic purposes solely, will defeat the just ends for which the irrigation laws were enacted, the ends for which your offices were created—the protection of prior rights. Hence, you will not distribute water for domestic use solely to any ditch when the parties thereunder have some other convenient and suitable supply of water for that purpose.

You will not distribute water to any ditch for domestic use, solely, unless it is demanded for that use, and then will allot to the ditch for that purpose only the amount of water which, when running for the period during each week you decide upon as necessary for the ditch, will be sufficient to enable the parties thereunder, with the means at their command, to store sufficient water to supply their domestic needs therefor until the following week. If there is not sufficient water to supply all ditches needing it, with water for domestic use, then you will give the preference to the older ditches in the order of priority decreed for irrigation purposes.

Should any of the water allowed a ditch for domestic use solely be used for irrigation, and the water commissioner be cognizant of that fact, he will deduct an amount corresponding to that so used for irrigation from the allowance for domestic use made to the ditch, and will notify the parties in charge of the ditch, and the superintendent of irrigation of his division, of the particulars leading to this action. The superintendent of irrigation will thereupon take such steps in the matter as he deems advisable and consistent with the general tenor of his duties. The water commissioner, unless otherwise instructed by the superintendent of irrigation, may restore the amount of water so deducted from the supply of water for domestic use, upon satisfactory assurance on the part of the ditch authorities that such unwarranted use of the water will not be again made.



In those cases in which injunction orders have been issued, you will, of course, strictly obey the letter of the injunction orders. Respectfully,

J. S. GREENE,  
*State Engineer.*

The effect of the distribution of water for domestic use, in compliance with the above mentioned decisions, was, as has been anticipated, to so deplete the streams that in some cases there was little or no water left therein for irrigation purposes, so that the priority of right to the use of water for irrigation afforded the earlier constructed ditches but little or no advantage, in the times of great scarcity, over those recently constructed. The effect was also prejudicial to the interests of the entire district, even when the amount of water drawn from the stream for the domestic supply of the more recently constructed ditches was not sufficient to entirely deplete the stream, for in that case the earlier constructed ditches would get their very earliest appropriations only, and as the ditches have almost invariably been greatly enlarged from small beginnings, the amounts of water they would receive would be but a small proportion of their carrying capacity, and the same great waste of water would take place when their first appropriations alone were turned into them, as takes place whenever a large irrigating ditch is supplied with that quantity of water only which is necessary to supply the domestic needs of the people under it.

This waste is accounted for by the fact that a larger per centum of the water carried by a ditch is lost to beneficial use, by reason of evaporation and seepage, when the ditch is partially filled than when filled to its capacity. And the smaller the quantity of water carried by a ditch, in proportion to its capacity, the greater is the per centum of loss from the causes mentioned. This fact will be the more readily accepted when attention is

called to the effort made during the past summer to get a comparatively small quantity of water to run in what is generally known as the "High Line Ditch," from its head to the city of Denver, and the effect of the distribution of water for domestic use may at the same time be illustrated. The High Line canal is about forty feet wide on the bottom, and the distance from the head thereof to the city of Denver is, with its meanderings, about forty-eight miles. Its capacity is one thousand one hundred and eighty-four cubic feet per second. If the people living thereunder and beyond the city limits were supplied *per capita* through this ditch with the same quantity of water for domestic use as that provided for the citizens of Denver, it would take less than one cubic foot of water per second to so supply them. Yet, to carry just this quantity of water to the city limits in this ditch was accompanied by a waste of about ninety-nine cubic feet of water per second. For one hundred cubic feet of water per second was, for a portion of last season, allotted to said ditch for domestic use, and I am assured by the manager and engineer that every effort was made to bring that water as far as the city, without supplying any laterals on the way, and the conclusion reached after several fair trials was that this amount of water would all be lost by the time it reached the city, except, perhaps, on cloudy days or immediately after a rain or flood in some of the gulches draining into the canal. Of course this exact condition of seepage and evaporation is not to be found in any other ditch; it will not even be exactly the same in this ditch another season. It is probably an extreme case. In some districts the soil is less porous than that in which this ditch is located, and the water of other streams carries more sediment in low stages, thus tending to prevent excessive percolation, than does the South Platte, which supplies this canal, so that great care should be used in drawing

conclusions from this recital. But it substantiates the facts above mentioned, and shows, to some extent, the effects of the distribution of water for domestic purposes, just stated, as observable in some of the districts.

As a result of the effects consequent upon the distribution of water for domestic use, and first referred to, a feeling favorable to the rotating of the waters in some of the districts became noticeable. By rotation of the water a few of the ditches could be abundantly supplied with water for a brief period, then completely shut off therefrom and the water distributed in like manner to other ditches, with the result that much of the water mentioned as lost by evaporation and seepage when small quantities of water are allotted to a ditch, might be thus saved to a beneficial use. The Superintendent of Irrigation of Division No. 1 was advised that, if during the contemplated absence of the State Engineer, this feeling favorable to rotating should in any district become universal among the ditch owners and users of water, not to refrain from complying therewith, provided that such a compliance on his part would not interfere with the rights to water, under the law, of those in other districts; and provided that it was distinctly understood that a distribution of water strictly according to priority (subject to the guidance afforded by the courts in the matter of water for domestic use) would be immediately resumed upon the request of any ditch owner in the district.

When, then, it became apparent that the irrigators of Water District No. 7 (Clear creek), influenced by the reasons given, preferred that the waters of the streams of their district be distributed to the ditches in rotation for irrigation, rather than distributed for domestic use solely, the superintendent of irrigation directed the water commissioner of that district to meet the people thereof, and if there were no protests on the part of any, to comply

with this desire. There was no protest, it is believed, further than it was claimed and understood to be a temporary yielding on the part of the older ditches, and without waiver of their rights as prior appropriators, to that peculiar condition occasioned by the unprecedented scarcity of water and unsettled state of the questions concerning water for domestic purposes. For a few weeks, at the close of the season, the waters of Clear creek were distributed as preferred, with, all things considered, not unsatisfactory results.

The consideration of the question closed for the season just passed, with the following decree rendered by the judge of the Eighth judicial district in the case of *The Larimer County Ditch Company, plaintiff, against John L. Armstrong, Water Commissioner, defendant*, which, by agreement, was made a test case, but which was rendered too late (about Nov. 10, 1888) to be of service this year as a guide to this department. It will be observed that the court differs but little in the judicial construction of the term "domestic use" from the interpretation previously given by this department thereto, and that the court contemplates what this department recognizes as of immediate and of the greatest importance, viz: Enactments by the General Assembly of this State prescribing regulations relating to the distribution of water for domestic purposes.

#### DECREE.

This cause having heretofore come on to be finally heard upon the pleadings and the evidence, as well as that on part of the defendant as that in behalf of the plaintiff, and the court having heard the same and the argument of counsel thereon, and having taken the matter under consideration for further advisement, and having duly considered the same, and being now fully advised in the premises, doth find the issues for the plaintiff. And the court doth specially find, from the pleadings and evidence aforesaid, that, at the time of the



commencement of this action, the plaintiff was and still is a corporation duly organized for and, among other things, engaged in the business of conveying and distributing from the Cache la Poudre river, to and for the use of persons residing along the line of its canal, water for domestic purposes. That the plaintiff's said canal is situate in Water District No. 3, and is some sixty miles in length. That the persons aforesaid residing along the line of said canal, at the time of the commencement of this action, were and still are, to a great measure, dependent upon the plaintiff and its said canal for water suitable and fit for domestic purposes, and in many instances are wholly dependent thereon for water for such purposes. That at the time of the commencement of this action there was flowing in and down said river sufficient water to supply the reasonable needs and demands of all appropriators and users of water therefrom for domestic purposes, if carefully distributed and with no more waste than is naturally incident to the customary manner of distributing water through open ditches and canals, but that the water of said river was insufficient for the service of all desiring the use of the same for various other beneficial uses. That the plaintiff has and controls a large reservoir for the storage of water situate upon the said river, above the head gate of its said canal, wherein it is wont from time to time to store a large amount of surplus water, to be afterwards drawn off and turned into its canal for beneficial uses. That the defendant, as Water Commissioner of Water District No. 3, had shut down and closed and threatened to keep shut down and closed the head-gate of the plaintiff's said canal, and had thereby deprived the plaintiff of the means of obtaining water wherewith to supply the same to the persons so dependent upon it for water for domestic purposes, save at such times when, by reason of increased flow of water in the river, the plaintiff may be entitled to take water therefrom under and by virtue of its appropriation thereof for agricultural purposes.

And the court doth further find, as a matter of law, that when the waters of said river are not sufficient for the service of all those desiring the use of the same, those using the water for domestic purposes are entitled



to divert and take the same according to their respective priorities of appropriation thereof for such purposes, notwithstanding any appropriation thereof by persons using the same for any other purpose. And the court doth further find and declare, as a matter of law, that the uses to which water may be applied which are comprehended by the term "domestic purposes," hereinbefore employed and occurring in the Constitution of this State, are as follows, and none other, that is to say—household purposes, including water for drinking, washing, bathing, culinary purposes, and the like; water for such domestic animals as are used and kept about the home, such as work animals and cows kept to supply their owners and their families with dairy products; and such other uses, not being either agricultural or mechanical, as directly tend to secure and promote the healthfulness and comfort of the home.

Wherefore, it is ordered and decreed by the court that the injunction heretofore allowed herein and served upon the defendant be, and the same is, hereby so modified as to operate and be effectual only as hereinafter decreed.

It is ordered and decreed by the court that the defendant, John L. Armstrong, Water Commissioner in and for Water District No. three (3), his successors in office, deputies, agents and servants, do absolutely desist and refrain from closing or keeping closed the head-gate of the canal of the plaintiff, the Larimer County Ditch company, for any period exceeding twenty (20) days at any one time, and he is and they are strictly enjoined, required and commanded, whenever water has been by them or any of them prevented from flowing from the Cache la Poudre river into said canal for the period of twenty (20) days; and he or they are thereunto requested by the plaintiff to permit sufficient water to flow into said canal from said river for a period of not less than five (5) days, to supply water for domestic purposes to all persons residing along the line of said canal and dependent thereon for water for such purposes, and to enable such persons to fill cisterns and such like receptacles for the storage of water for such purposes; *Provided*, That there be water flowing in said river to which other persons are not entitled by prior appropriation thereof for

domestic purposes, and, further, that the plaintiff shall not have water at such time stored in its said reservoir. It is ordered and decreed that the plaintiff shall not, as against the rights of any prior appropriator of water for agricultural purposes, at any time when it has water stored in its said reservoir, be entitled to divert or take any water from the said river not flowing down from its said reservoir.

It is further ordered and decreed by the court that, except as herein and hereby modified, the injunction heretofore allowed be, and the same is made perpetual; saving and reserving, however, to each party the right to move the court at any time so to modify this decree as to make it conform to the provisions of any law that may hereafter be enacted by the General Assembly of this State prescribing regulations relating to the distribution of water for domestic purposes. It is further ordered that each party pay its and his own costs incurred herein. By the court.

T. M. ROBINSON, *Judge*.

The demands upon the time of the State Engineer, other than those mentioned, were very numerous. The particulars of the transactions of his office in minor matters, such as the examination into complaints and correction of abuses in the distribution of water, the character and replies to petitions affecting individual interests, and the correspondence with people interested in irrigation, on all manner of subjects connected therewith, can not, of course, be given herein. But a brief recital of some of the interesting points connected with two suits to which the State Engineer was made a party, and which made very considerable encroachment on his time, may be advisedly inserted here. The most important of these actions was brought by the Farmers' High Line Canal and Reservoir Company, supported by other ditch companies, whose canals, also, were supplied with water from Clear creek, to restrain the officers of this department from cutting off the supply of water

from certain ditches on Clear creek, in Water District No. 7, and supplying therewith certain other ditches, having prior rights to the former under the decrees, which drew water from the South Platte river, in Water District No. 2, below the junction of Clear creek therewith, *i. e.*, to restrain the distribution of water to ditches in accordance with their priority in the division, and without reference to the district in which they are situated.

In this matter a restraining order was granted, in accordance with the prayer of the plaintiffs, about July 1, 1888, by the District court of the Second judicial district. Subsequently an application for a preliminary injunction was made and heard, and on the fourteenth of July the injunction was denied in the following words:

“The application of plaintiffs for a preliminary injunction hearing having come on to be heard before one of the judges of the court, upon the complaint and oral evidence produced by the respective parties hereto, and having heard the arguments of counsel, it is now ordered that the restraining order heretofore granted, pending this hearing, be vacated, and said application for a preliminary injunction is denied; nevertheless, it is now ordered by the court that whenever the defendants, or either of them, shall order any of the head-gates of ditches or canals of water in District No. 7 to be closed for the purpose of supplying water to irrigating canals or ditches in any other water district, they shall cause immediate notice of such order to be given to the plaintiffs or their counsel, so that plaintiffs may, if they desire, inspect the result of such experiment in shutting off the water in one water district to supply the ditches in another water district.”

And the opinion below given was delivered by Hon. Victor A. Elliott, judge:

“*First*—The right to divert the unappropriated waters of natural streams to beneficial uses, and the superior right of prior appropriators as between those

using the water for the same purpose, are fundamental rights guaranteed by the Constitution.

“*Second*—The legislature may regulate, but can not destroy nor substantially impair these rights, by dividing the State into water districts and causing decrees adjudicating priorities in such water districts to be separately entered.

“*Third*—The act of 1887, providing for the enforcement of right to the use of water without regard to the water district within which the ditches or canals may be located, may be carried into effect by the superintendent of irrigation or State Engineer, and they will not be enjoined from so doing, unless it shall be clearly made to appear that the canals or ditches to which they accord priority, are not entitled thereto by reason of the date of their construction and use as against those denied, or that the wastage of water caused by such attempted enforcement would be so great as that the diversion could not in equity be considered a diversion for beneficial use.

“*Fourth*—The decrees adjudicating the priorities of right to the use of water in the several water districts, when duly entered, pursuant to the acts of 1879 and 1881, are conclusive between the ditches and canals specified therein in the same district, though only *prima facie* evidence of such priorities as between ditches and canals of different districts. By this construction we uphold and give practical effect to the legislation of 1879, 1881 and 1887, without denying any person's right to be heard in court as to every matter affecting his interest.

“The superior right of prior appropriators to the use of water for beneficial uses, as against junior appropriators from the same natural stream and for the same purpose, is fundamental in this State, being incorporated into the Constitution in absolute and express terms.

“In this case, which relates only to the use of water for irrigation, we are confronted with the new phase of the many difficult questions attending the distribution of water under our Constitution and laws, and the peculiarities of our soil and climate.



"So far as I now remember, the precise question here involved has never arisen in any judicial proceeding in this State, though several years ago, in one of my official reports concerning defects in our irrigation laws, I called attention to the substantial difficulty here presented.

"Neither the law of 1879 or the law of 1881, amendatory thereof, contained any provision for the distribution of water for irrigation, except as between ditches in the same water district and under the charge of the same commissioner.

The complaint in this action shows that the plaintiffs are the owners of certain ditches in Water District No. 7, Clear creek, a tributary of the South Platte river. It further shows that the superintendent of irrigation and the State Engineer, acting under the law of 1887 for the purpose of enforcing the priority of appropriation in favor of certain ditches in Water District No. 2, a portion of the South Platte below the mouth of Clear creek, have ordered the head-gates of plaintiff's ditches shut down; and this action is brought to restrain defendants from closing said head-gates.

"The plaintiffs rest their claim upon several grounds, which are substantially as follows:

"It is claimed that, by the acts of 1879 and 1881, making Clear creek a separate water district, and providing for the adjudication of the priority of right to the use of water between the several canals, ditches and reservoirs therein, and the decree of this court entered in pursuance thereof, the plaintiffs, and other appropriators from Clear creek, have gained superior and independent rights in and to the waters of Clear creek, as specified in the decree adjudicating the priorities aforesaid, and that these rights are no longer subject to the rights of prior appropriators from the South Platte river below the mouth of Clear creek.

"To admit this claim without limitation would be destructive of the doctrine of the 'better right' of prior appropriations, as declared by the Constitution. For, if the legislature, by an arbitrary division of the State into water districts, may limit the rights of prior appropriations, they may create as many water districts as they please, and thus destroy such rights altogether.



“The South Platte is now divided for convenience into three districts; it might have been divided into six or twelve; Clear creek and other tributaries of the Platte might also have been subdivided. The legislature may regulate the priorities of right to the use of water by providing means for their manifestation and enforcement; but such rights can not be destroyed nor substantially impaired by legislation while our Constitution remains unchanged.

“It is further claimed that the defendants, though agents of the State, ought not to be allowed to shut down the head-gates of plaintiffs’ ditches in favor of supposed prior appropriators in Water District No. 2 upon the ground, as they allege, that they were not parties to the record, had no notice constituting ‘due process of law,’ and never had their ‘day in court,’ in the proceeding by which the priorities of the ditches in said District No. 2 were adjudicated. So far these averments can not be denied.

“Plaintiffs also allege that the ditches in District No. 2 are not in point of fact, by reason of the date of their construction and use, entitled to priority over the ditches of plaintiffs. If this latter averment can be substantiated, then undoubtedly the plaintiffs would be entitled to relief in some form. But no proof has been offered on this point except the decrees adjudicating priorities in Districts No. 2 and No. 7, respectively.

“Upon this state of the proof, I am of opinion that these decrees may be considered *res judicata* and conclusive as to the priorities between the canals and ditches in the same water district, though only *prima facie* evidence of such priorities as between the canals and ditches of different districts.

“The owners of canals or ditches in one district may attack and impeach the correctness of the decree adjudicating the priorities of the ditches and canals of another district; but until such decrees are so impeached and shown to be incorrect, they may be considered correct, and may be relied on by the agents of the State appointed to distribute the water to the several ditches without regard to the water district in which such ditches may be located. By this construction we uphold

the acts of 1879, 1881 and 1887, and give practical effect and support to the many adjudications and vast system of irrigation that has sprung up thereunder; moreover, by this construction no person's right to be heard in court as to every question of law or fact affecting his interest is denied.

"The proper distribution of water under the laws of this State is a most difficult undertaking at the best, and all laws passed by the legislature in aid thereof should receive the most careful consideration and liberal construction by the courts, and thereby the people may be led to be more patient and forbearing as we make repeated experiments in the endeavor to solve the vexatious problem.

"Another ground upon which plaintiffs rely and upon which a great amount of testimony has been heard, may be stated as follows:

"Notwithstanding the ditches in District No. 2 were constructed and used for appropriating water to a beneficial use at an earlier date than plaintiff's, and even conceding that the doctrine of priority of appropriation extends from one district to another, and to the tributaries as well as to the main stream; notwithstanding all this may be theoretically true, and constitutionally and legally established, still practically it cannot be enforced, and ought not to be attempted in this case for the reason that it would be a vain and fruitless endeavor, and would result in the loss of the water to the plaintiffs without any substantial advantage to the ditches in District No. 2. The averment of the complaint is to the effect that the ditches in District No. 2 would gain no material benefit by the diversion of the water from the plaintiff's ditches, and at this season of the year not more than one-twentieth part of the water shut out from plaintiff's ditches would over reach the ditches in District No. 2, by reason of the evaporation and seepage into the dry bed of the Platte that would take place in the transit.

"If the averment could be clearly established, certainly a court of equity might well hesitate to allow such waste, even though the Constitution and laws are so strict and imperative in favor of the superior rights of prior appropriators.

“But the proof has not, in my judgment, sustained this allegation. Much of the testimony of the plaintiffs cuts both ways. Several witnesses testified that, from their observation and judgment, the irrigation of lands along the upper Platte and its tributaries in the early part of the season has caused the bed of the lower Platte and the surrounding river bottoms to be kept supplied with considerable water and moisture by the seepage resulting from such irrigation—some witnesses even going so far as to say that, in their opinion, the ditches in District No. 2 were the direct gainers by the diversion of the waters for irrigation as above stated, nearly, if not quite, to the extent of the water so diverted. My own judgment, founded on testimony given on this, as well as other trials, is that much of the water used for irrigation along the head-waters of natural streams in the early spring is thus held back, and that a considerable portion of it, by seepage, finds its way back to the natural stream, lower down, later in the season. While this mitigates the damage suffered by appropriators of water from the lower Platte, on account of the diversion of the waters above them for irrigation, it is not shown to be sufficient to compensate the loss; but it is sufficient to greatly impair, if not entirely overthrow the theory that the bed of the South Platte is so dry and thirsty as to absorb the waters of Clear creek, if allowed to flow therein in time of drouth.

“Undoubtedly a certain percentage of the waters of every natural stream is carried off by evaporation, as it flows onward to the sea, and this may be capable of approximate estimation, but in this case it has not been shown to be so great as to be alarming.

“The framers of our Constitution and laws must be supposed to have been familiar with the operation of the ordinary laws of nature, and to have legislated accordingly.

“If required to make a special finding, based on the testimony offered, I should say that between June 28 and July 7, if a body of water equal to 300 or 400 cubic feet per second of time had been allowed to flow in its natural channel from District No. 7 to District No. 2, two-thirds or three-fourths thereof would have reached its

destination. The amount would undoubtedly vary considerably under different circumstances. At best, it would seem that the most careful and scientific observers can only make an approximate estimate. Future experiments may enable us to attain greater accuracy.

"In my judgment, the courts should not attempt by injunction to prevent the enforcement of the law looking to the supply of water to prior appropriators unless the wastage of water caused by much attempted enforcement would be so great as that the diversion could not in equity be considered a diversion to beneficial use. No such condition having been shown on this hearing, the application for an injunction will be denied.

"In order that the plaintiffs may have the advantage of observing the result of experiments in turning water from their ditches in time of scarcity of water, I will direct that the defendants give immediate notice to plaintiffs or their counsel of any and all orders hereafter made for that purpose."

The order "That the defendants give immediate notice to plaintiffs, or their counsel, of any and all orders hereafter made for that purpose," was complied with by this department, through a desire to forward the ends set forth in the order, though it is believed that the prerogative to so hamper and direct the actions of this department does not belong to the District court.

The other action mentioned was brought by Wm. A. Hamill and the Page Water Company, in the District court of the Second judicial district, to compel the State Engineer, Superintendent of Irrigation and Water Commissioner of Water District No. 7, to "permit the waters of Clear creek to flow in their natural channel, so that they may reach the head-gate of the plaintiffs' ditch, and that the said waters to the amount of seventeen and twenty-five hundredths cubic feet per second shall be turned into the plaintiffs' ditch to be used for domestic and irrigating purposes upon the plaintiff Hamill's lands." To this end an injunction order was issued, June 26, 1888.



This action was taken by the plaintiffs after the defendants had refused to comply with their demand for water for their ditch known as the Page ditch, the dates and amounts of appropriation for which had never been determined by any competent court. This refusal was based on the grounds that, in times of scarcity, the waters of any district should be distributed strictly in accordance with the decree governing the dates and amounts of appropriations of the ditches in the respective districts; and that, as there was not sufficient water in Water District No. 7 to supply the ditches embraced in the decree, nor even to supply the ditches having priorities, according to the decree, antedating that claimed by the Page ditch, to wit: November 15, 1873, the said ditch was not entitled to water under the law or in equity.

The commands of the injunction order were, of course, observed. Several interested parties as quickly as possible brought the matter up for hearing; whereupon the court modified the order, but in effect required of this department to distribute water to the said Page ditch as though it were embraced in the decree and were entitled to a date of appropriation of November 15, 1873, and to a quantity of water amounting to 17.25 cubic feet per second; though provision for a rehearing of the matter, upon due notice to interested parties, was made.

#### ESTABLISHMENT OF COUNTY BOUNDARIES.

Whenever the boundary line of any county in this State shall be so indefinite that a portion of territory, by reason of such indefinite description, is claimed by two counties, and such fact shall appear by petition of the board of county commissioners of either county to the State Engineer, then, under that enactment of the General Assembly, entitled "An act to provide for the settlement of disputed county boundaries in this State,"



approved April 4, 1887, it becomes the duty of the State Engineer, in connection with the county surveyor of each of said counties, to run out and establish such line, as nearly as may be, in accordance with such defective description, and to fix and define such boundary line by plain and substantial mounds and marks, and unmistakable natural monuments, and to furnish the board of county commissioners of each of such counties with a description of such line as soon thereafter as may be practicable.

As the duties devolving upon the State Engineer were already so considerable, it is to be regretted that in the act mentioned provision had not been made for the appointment of a deputy to represent him in such matters. It is not certain but that the State Engineer would have been warranted in appointing a deputy to act for him in the settlement of disputed county boundaries, but rather than run the risk of having an expensive survey called in question on such grounds, it was determined that he should in person establish county boundary lines, if called upon to do so. At the same time it was recognized that in this formative period of our irrigation development, the most important duties the State Engineer could be called upon to perform were those connected with irrigation matters, and it was determined that all other duties must yield to those. As the defective descriptions of the boundary lines between counties were found to be in the mountainous portions of the State, where the surveys provided for could only be made during the summer or fall, the latter period was set aside for that work, being the time when the State Engineer could be better spared from his office.

The first petition for the establishment of a county boundary line was prepared and presented by the clerk of the county of Gunnison, in accordance with the action

of the board of county commissioners of said county, set forth in the following minute:

STATE OF COLORADO, }  
*County of Gunnison,* } ss.

At a regular meeting of the board of county commissioners for Gunnison county, Colorado, held at the court house in Gunnison, on Thursday, the twenty-eighth day of July, A. D. 1887, there were present, A. K. Stevens, chairman; J. F. Pearson, commissioner, and D. C. Scribner, clerk, when the following proceedings, among others, were had and done, to wit: Whereas, there is a dispute as to the boundary line between Gunnison and Saguache counties, and a portion of territory is claimed by each of said counties; therefore, it is hereby ordered that this board petition the State Engineer, with the county surveyors of each of said counties, if they shall appear after due notice, to run out and establish the boundary line between said counties, and to fix and define said boundary line by plain and substantial mounds and marks, and to furnish the board of county commissioners of each of said counties with a description of such line, as provided by "An act to provide for the settlement of disputed county boundaries in this State," approved April 4, 1887.

And the clerk is hereby authorized to make and sign a petition in the name of this board, and on behalf of said Gunnison county, to the State Engineer, to run out and establish said county line, as required by law.

STATE OF COLORADO, }  
*County of Gunnison,* } ss.

I, D. C. SCRIBNER, county clerk and *ex officio* clerk of the board of county commissioners in and for the county and State aforesaid, do hereby certify that the annexed and foregoing order is truly copied from records of the proceedings of the board of county commissioners for said Gunnison county, now in my office.

*In witness whereof,* I have hereunto set my hand and affixed the seal of said county, at Gunnison, this first day of August, A. D. 1887.

D. C. SCRIBNER,  
*County Clerk.*

The description of the boundary line between the said counties is found in chapter XXI. of the General Statutes of Colorado, entitled "County Boundaries." It appears therein that the counties of Gunnison and Saguache have a common boundary line which is a parallel of latitude, and also a common boundary line which is a meridian of longitude. The latter line is described in the said chapter XXI. as the one hundred and seventh degree of west longitude, and with the description thereof there has been no defect found. The position of the former line, however, will vary with the interpretation put upon the description of the location of the initial point, from which that line is said to run due west. It appears from section 4 of the said chapter that this initial point, if it may be so called, is the north-west terminus of a line running north-westerly along the summit of the Sangre de Cristo range, and that it is designated as "the top of the range at the Poncha Pass." Notwithstanding the fact that the summit of the Sangre de Cristo range, in the vicinity of Poncha Pass, is clearly defined, being not less than two thousand five hundred feet higher than the lowest point on the crest of the Poncha Pass, and does not terminate at, but runs beyond, the Poncha Pass, there are some who so interpret the description of the location of this so-called initial point as to hold that its position is on the Poncha Pass itself. A part of the number making this interpretation hold that the position of the so-called initial point is immediately adjacent to the old wagon road, used at the time of the establishment (by description) of the boundary line of Saguache county, and at the highest level reached by said road in crossing Poncha Pass.

In support of which interpretation, it is urged that such was understood to be the location of the point in question by the members of the legislature describing

it. But there are others of this number holding that the position of the initial point is on the Poncha Pass, who place it at the lowest point on the summit, crest or water-shed of the said Pass. Another interpretation of the description is to the effect that the nearest point on the summit of the Sangre de Cristo range to the Poncha Pass should be taken as the initial point from which to run the line in question. These interpretations were fully considered by the State Engineer and the county surveyors when the line was established in the fall of 1887. To aid in understanding the description set forth in the said section 4, attention in the report made to the boards of county commissioners was called to section 20 of the same chapter, and therein, in the description of the boundary of Lake county, from which Gunnison county was taken, it appears that the south boundary line of Lake county ran "east along the north boundary of Saguache county to the top of the range at the Poncha Pass, thence north-easterly along the summit of the range, crossing the Arkansas river at a point three miles below the mouth of the South Arkansas river." The position of the point designated in both of said sections 4 and 20, as "the top of the range at the Poncha Pass," and set forth in each of said sections as being on the north boundary of Saguache county, is more definitely located by the description in section 20, in so much as it is therein set forth not only as being on "the top of the range at the Poncha Pass," but also on the summit of the range that runs north-easterly, crossing the Arkansas river at a point three miles below the mouth of the South Arkansas river. Since, by section 4, it must also be on the summit of the Sangre de Cristo range, it follows that "the top of the range," means the top of the Sangre de Cristo range, and that the so-called initial point is at the intersection of the lines running along the summits of the said ranges.



The test of the definiteness of the description, and of the correctness of this interpretation thereof, apparently lay in the examination of the country in the vicinity of Poncha Pass, for the purpose of determining whether the range mentioned in the description as the Sangre de Cristo range, and that described as running north-easterly to the Arkansas river actually existed, whether their summits were clearly defined, and whether the point of intersection of the lines along their summits could be determined. Such an examination was made. The summit of the Sangre de Cristo range was found to be clearly defined, as before stated, in the vicinity of Poncha Pass, as was also the summit of the range running in a general course of north eleven degrees east from the Sangre de Cristo range to the Arkansas river, and intersecting the same at or about three miles below the mouth of the South Arkansas river.

The summit of this range was also clearly defined, and no difficulty was experienced in locating the intersection of the lines along their summits, as they met at a moderately sharp peak, designated as Intersection Peak on the plats, furnished, with the description of the line, to the boards of county commissioners of said counties. On those plats the topography of the country in the vicinity of Poncha Pass was shown, as it is set forth on the United States topographical maps prepared by F. V. Hayden, from United States surveys in 1874-5, and designated as "Sheet VII." in the "Atlas of Colorado."

After due consideration of the description, and careful examination of the topography of the country, the summit of the so-called Intersection Peak was selected as the initial point from which to project west the north line of Saguache county. While not the nearest point on the summit of the Sangre de Cristo range to Poncha Pass, it was the nearest point from which a range ran north-easterly as designated in the sections before men-



tioned. This matter of the location of the initial point has been thus fully set forth, in order to indicate that the important duty of determining its position was neither hastily nor inconsiderately performed, and the various initial points claimed by parties interested were duly shown on said plats, that, should the matter be taken into the courts as provided for in case of dissatisfaction, by the act mentioned, there would be at hand all the necessary information for the determination of the cause.

Monuments mark the line at frequent intervals wherever the adjacent land is of such value as to indicate such to be desirable; while at the eastern end of the line, for a few miles, where the expense of carefully set monuments would have been very great, the line is described from the government monuments on Mount Ouray and other peaks, so carefully, that its location can not be in doubt.

The field notes and plats of the survey are on file in the records of the counties and in this office, and it is not thought necessary to encumber this report with them, but to close the remarks on this subject with a description of the general plan of survey. The general plan adopted in making this survey consisted:

*First*—In determining the latitude of the initial point on the summit of the Sangre de Cristo range.

*Second*—In determining the location of the north-west corner of Saguache county, *i. e.*, of a point on the 107th degree of west longitude and having the same latitude as that of the initial point.

*Third*—In establishing the 107th degree of west longitude between the north-west corner of Saguache county and a point ten miles north of the 38th degree of north latitude, *i. e.*, south-east corner of Gunnison county.

*Fourth*—In establishing the parallel of latitude running east from the north-west corner of Saguache county to the Snowy range, *i. e.*, to Mount Ouray.



# PREFACE

TO

## Chapters II., III., IV., V., VI. and VII.

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These chapters are confined almost entirely to statements of facts concerning the different water divisions and water districts in the State. Except where indicated, the extracts from the reports of the water commissioners and superintendents of irrigation are not always verbatim, but it is believed they express accurately the opinions of these officers upon the matters referred to by them. The consideration of most of the questions raised by these officers in their reports, will be found in Chapter I., or Chapter IX., of this report. The descriptions of the water divisions and water districts in Chapters II. to VII. are not given with that minute particularity of wording, and reference to dates of approval, etc., with which they are set forth in Chapter I. hereof.

The statements concerning the ditches, and the use made of water therefrom, furnished by water commissioners, are not to be regarded as perfectly accurate. Various causes prevented the commissioners from accomplishing the ends, in this direction, at which they aimed, but these statements will afford, with considerable accuracy, information that is greatly needed.



## CHAPTER II.

*Water Division No. 1, South Platte Division.*—Mr. Timothy O'Connell, Superintendent of Irrigation. Appointed April 22, 1887. Residence: Denver, Colorado.

Water Division No. 1 includes all water districts consisting of lands watered from the South Platte river and its tributaries, and is named the South Platte Division. This water division contains water districts numbered one to nine, inclusive, and that numbered twenty-three. The latter district was created by the Governor, August 30, 1888. The duties of the superintendents of irrigation are set forth in the preceding chapter. They are more arduous in this division than in any other. On January 9, 1888, and November 21, 1888, Mr. O'Connell filed in this office his reports for the preceding irrigating seasons. The report for the season of 1888 includes a list of the artesian wells in his water division, concerning which he had secured statements; a tabulated statement showing, with reference to each ditch in his division embraced in the certified copies of decrees furnished to him by the clerks of the District courts, the name of the ditch, the name of the stream from which water is diverted by the ditch, the order of priority of the ditch in the district, the dates of appropriations of water decreed to the ditch, the number of cubic feet per second decreed to each priority, the summation of appropriations decreed to each ditch and the number of cubic feet per second appropriated previously in the district; a similar statement relative to the reservoirs embraced in the certified copies of decrees furnished him; a synopsis of the reports of the water commissioners of his division, all of which information is found under the heads of the proper water districts in this chapter; to-



gether with remarks, suggestions and recommendations, in effect as follows:

That the water commissioners of his water division report for the past season fair crops, considering the great scarcity of water; that the authority of the water commissioners had been respected in all of the water districts, except Nos. 7 and 5; that in these districts some of the head-gates were tampered with after having been set by the commissioners; that the head-gates of all ditches should be provided with locks, the commissioners furnished with duplicate keys thereto, and some method adopted of holding the owners of ditches responsible for any tampering with the head-gates after they have been adjusted by the commissioners; that there should be enacted by the legislature at the coming session a law governing the distribution of water for domestic use; that the services of the water commissioners should not be limited to eighty days, but provisions should be made for extending the time of their services when necessity so demands, and \$7.00 per diem should be allowed them when engaged in the performance of their duties; that, if possible, measures should be taken to correct the injustice occasioned by decreeing to ditches a larger quantity of water than they ever applied to beneficial uses, and permitting them when subsequently enlarged to appropriate the quantity decreed, at the expense of those who, with later appropriations according to the decrees, were nevertheless the first to utilize the waters of the streams in irrigation, and that many other matters relative to irrigation demand the prompt consideration of the legislature.

*Water District No. 1—Amos A. Smith, Water Commissioner.* Appointed May 18, 1887. Post-office address, Sterling, Colorado.

Water District No. 1, consists of all lands irrigated from ditches taking water from the South Platte river

and its tributaries, between its intersection with the State line of Colorado and Nebraska and the mouth of the Cache la Poudre river.

A plat of this water district, prepared from the report of the water commissioner thereof, is given in Part II. of this report.

Mr. Smith reports for the year 1887, that he was first called to distribute water on June 23, and that he was employed during that year thirty days in the performance of his duty.

Mr. Smith reports for the year 1888 (*inter alia*), that he was first called out in the performance of his duty on May 18, the call coming from ditches in Logan county; that, on examination, he found the water in the stream very low, only thirteen cubic feet per second coming into the district; that this by seepage had increased to seventy-four cubic feet per second at the head of Weldon Valley ditch, twenty miles to the east; that it was necessary to close all the ditches in Weld county to supply ditches lower down on the South Platte with water for domestic use; that this was unsatisfactory to all concerned, owing to the great loss occasioned by evaporation and the seepage of water into the sand in the bed of the channel; that the waste seemed to be fully one-half of the water turned down; that the actual time employed in the distribution of water during this season was eighty-six days; that his assistant at the head of Beaver, Box Elder and Bijou creeks, located at Elbert, in Elbert county, was employed fifteen days; that J. L. Kirby, his assistant for Logan county, had made no report; that the commissioner, if authorized to rotate the water, could accomplish much more with the water coming into his district than by distributing it in accordance with priority established by the decrees; that his district is so large and the expenses connected with his duties so great that the salary of \$5 for each day

actually employed in the work of distributing water is not sufficient remuneration for the services rendered; that his actual expenses for traveling during the season last past were \$167.35; that the period of eighty days, specified in the law as the time which water commissioners may serve during each irrigating season, is not sufficiently long; that the following particulars concerning the ditches and the use made of water in his district are estimated after securing all the assistance possible from the ditch owners and superintendents of ditches, who were not, however, willing to afford much information concerning their ditches and the crops irrigated therefrom:

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 1,  
BY THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Hoover . . . . .	800	50	300	100		
South Platte . . . . .	9	6,000	100	180	500	
Pawnee . . . . .	23	30,000	1,300	50	700	1,500
Sterling . . . . .	15	5,000	700	4,000	500	
Tetzel . . . . .	6	1,500	80	1,000	50	
Schneider . . . . .	5	3,000	100	200	100	
Illinois . . . . .	4	2,000	50	800	35	
Putnam . . . . .	9	2,560	140	1,100	120	
Henderson & Smith . .	3	800	80	320	80	
Weldon Valley . . . . .	16	7,000	100	50	200	3,000
Platte and Beaver Main	25	20,000	300	500	1,500	
Platte and Beaver Supply	25	15,000	250	700	1,000	
Low Line . . . . .	6	2,300	80	500	200	
Fort Morgan . . . . .	25	20,000	1,200	2,000	5,000	
Hardin . . . . .	3	500	50	200	100	
Deuel & Snyder . . . .	7	2,500	100	1	500	200
Iliff and Platte Valley . .	14	10,000	100	2,000	200	
Sterling No. 2 . . . . .	7	6,000	100	1,500	450	
Springdale . . . . .	20	5,000	50	200	150	
Riverside . . . . .	5½	2,000	50	1,000	25	
Beaver . . . . .	5	4,000	80	320	200	
Island Farm . . . . .	5½	3,000	40	600	150	

So that there were irrigated in this district, during the year 1888, from 238 miles of ditches, 5,100 acres of alfalfa, 101 acres of seeded grasses, 19,120 acres of natural grasses, and 15,160 acres of other crops, making a total of 39,719 acres, while the area of land that could be irrigated in this district under the ditches already constructed is about 150,000 acres.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 1.

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION No. 1, FROM THE CERTIFIED COPY OF THE DECREE, GOVERNING APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF DITCH, CANAL OR RESERVOIR.	Stream from which water is taken.	Date of appropriation.	Cubic feet of water per second decreed to each priority.	Summation of decree to each ditch, canal or reservoir.	Cubic feet of water previously appropriated in district.	Order of priority in district.
The Hoover ditch . . . . .	South Platte . . . . .	April 20, 1868 . . . . .	. . . 20 . . . . .	. . . . .	. . . . .	1
The South Platte ditch . . . . .	South Platte . . . . .	May 1, 1872 . . . . .	. . . 84 . . . . .	. . . . .	. . . 20 . . . . .	2
The Pawnee ditch . . . . .	South Platte . . . . .	Sept. 17, 1873 . . . . .	. . . 67 . . . . .	. . . . .	. . . 104 . . . . .	3
The Sterling Irrigating Co.'s ditch . . . . .	South Platte . . . . .	Oct. 25, 1873 . . . . .	. . . 162 . . . . .	. . . . .	. . . 171 . . . . .	4
The Tetzel ditch . . . . .	South Platte . . . . .	Nov. 15, 1874 . . . . .	. . . 21 . . . . .	. . . . .	. . . 333 . . . . .	5
The Schneider ditch . . . . .	South Platte . . . . .	Aug. 20, 1875 . . . . .	. . . 72 . . . . .	. . . . .	. . . 354 . . . . .	6
The Illinois ditch . . . . .	South Platte . . . . .	Jan. 1, 1876 . . . . .	. . . 52 . . . . .	. . . . .	. . . 426 . . . . .	7
The Putnam ditch . . . . .	South Platte . . . . .	April 1, 1880 . . . . .	. . . 15 . . . . .	. . . . .	. . . 478 . . . . .	8
The Schneider ditch, first enlargement . . . . .	South Platte . . . . .	Oct. 20, 1880 . . . . .	. . . 37 . . . . .	. . . 109 . . . . .	. . . 493 . . . . .	9
The Henderson & Smith ditch . . . . .	South Platte . . . . .	May 1, 1881 . . . . .	. . . 21 . . . . .	. . . . .	. . . 530 . . . . .	10
The Weldon Valley ditch . . . . .	South Platte . . . . .	Oct. 26, 1881 . . . . .	. . . 196 . . . . .	. . . . .	. . . 551 . . . . .	11
The Putnam ditch, first enlargement . . . . .	South Platte . . . . .	April 26, 1882 . . . . .	. . . 36 . . . . .	. . . 51 . . . . .	. . . 747 . . . . .	12
The Platte and Beaver Main ditch . . . . .	South Platte . . . . .	June 20, 1882 . . . . .	. . . 373 . . . . .	. . . . .	. . . 783 . . . . .	13



The Pawnee ditch, first enlargement . . . . .	South Platte . . .	June 22, 1882	. . . 348 .	. . . 415 .	. . . 1,096 .	14
The Tetzel ditch, first enlargement . . . . .	South Platte . . .	July 1, 1882	. . . 31 .	. . . 52 .	. . . 1,444 .	15
The Platte and Beaver Supply ditch . . . . .	South Platte . . .	Sept. 4, 1882	. . . 460 .	. . . . .	. . . 1,475 .	16
The Low Line ditch . . . . .	South Platte . . .	Oct. 14, 1882	. . . 52 .	. . . . .	. . . 1,935 .	17
The Fort Morgan canal . . . . .	South Platte . . .	Oct. 18, 1882	. . . 357 .	. . . . .	. . . 1,987 .	18
The Hardin ditch . . . . .	South Platte . . .	Feb. 21, 1884	. . . 33 .	. . . . .	. . . 2,344 .	19
The Denel & Snyder ditch . . . . .	South Platte . . .	April 7, 1884	. . . 35 .	. . . . .	. . . 2,377 .	20
The Iliff and Platte Valley ditch . . . . .	South Platte . . .	July 10, 1884	. . . 379 .	. . . . .	. . . 2,412 .	21
The Sterling No. 2 ditch . . . . .	South Platte . . .	July 15, 1884	. . . 84 .	. . . . .	. . . 2,791 .	22
The Springdale ditch . . . . .	South Platte . . .	July 15, 1886	. . . 115 .	. . . . .	. . . 2,875 .	23
The Riverside ditch . . . . .	South Platte . . .	Nov. 29, 1886	. . . 36 .	. . . . .	. . . 2,990 .	24

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 1, RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO DECEMBER 1, 1888.

NAME OF DITCH	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Island Farm canal . . . . .	South Platte . . . . .	Sept. 17, 1887	June 18, 1887	108.00	Amos A. Smith
The Noah Cann ditch . . . . .	Running creek . . . . .	Feb. 28, 1888	Feb. 27, 1888	39.60	Noah Cann
* Bijou ditch . . . . .	Bijou creek . . . . .	Mar. 9, 1888	Feb. 23, 1888	30.00	Chas. S. Owens, Geo. A. Snow
Paige & Foster ditch . . . . .	Bijou creek . . . . .	May 9, 1888	Feb. 10, 1888	. . . . .	Charles F. Paige, David S. Foster
† Dry Creek Ditch No. 1 . . . . .	Little Dry creek . . . . .	May 18, 1888	Oct. 1, 1886	5.00	J. D. Hooper
† Dry Creek Ditch No. 2 . . . . .	Little Dry creek . . . . .	May 18, 1888	May 4, 1888	20.00	J. D. Hooper
‡ The Lone Tree ditch . . . . .	Lone Tree creek . . . . .	May 19, 1888	May 15, 1882	48.00	The Lone Tree Ditch Co
§ Byers' High Line ditch . . . . .	West Bijou creek . . . . .	June 9, 1888	Mar. 28, 1888	74.00	Kollan Sherman, Leonard McDonnell
The Wadlin ditch . . . . .	Crow creek . . . . .	July 30, 1888	July 26, 1888	117.00	J. M. G. Wadlin
Paige & Foster ditch . . . . .	Bijou creek . . . . .	Aug. 4, 1888	Feb. 10, 1888	50.00	C. F. Paige, David S. Foster
¶ D. C. Bailey ditch . . . . .	Kiowa creek . . . . .	Sept. 14, 1888	April 3, 1888	0.083	D. C. Bailey
The Farr & Severance ditch . . . . .	Crow creek . . . . .	Sept. 28, 1888	July 26, 1888	15.18	Wm. H. Farr, D. E. Severance

\* Probably diverts the water of West Bijou creek.  
 † Known as Dry Creek reservoir and Ditches Nos. 1 and 2. Dry Creek reservoir, with an area of 10.6 acres, is connected with this ditch. Work of construction thereof commenced May 4, 1888. Capacity not given.  
 ‡ Same as Dry Creek Ditch No. 1. See paragraph next above.  
 § Charles Emerson, president; Fred E. Smith, secretary.  
 ¶ Reservoirs 1, 2, 3, 4, 5 and 6, with capacities, respectively, of 4,275,000, 670,550, 875,700, 2,870,000, 3,932,280 and 6,996,000 cubic feet, are to be supplied thereby.  
 ¶ Capacity claimed, 144 cubic inches per second, i. e., equals 0.083 cubic feet per second.

# STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 1,

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RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream supplying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
* Oasis Reservoir . . . . .	{ First creek, Second creek, Third creek and South Platte river.	{ Burlington ditch and feeders from First, Second and Third creeks.	Oct. 29, 1888	Oct. 15, 1888	400,000,000.00	{ The Oasis Water Supply Park and Im- provement Co., by W. E. Meek.
Dry Creek Reservoir . . . . .	{ Little dry creek.	. . . . .	May 18, 1888	May 4, 1888	. . . . .	. . . . . J. D. Hooper
Byers' Reservoir No. 1 . . . . .	Bijou creek . . . . .	{ Byers' high line ditch . . . . .	June 9, 1888	Mar. 28, 1888	4,275,000.00 . . . . .	. . . . . Rollan Sherman, Leonard McDonnell
Byers' Reservoir No. 2 . . . . .	Bijou creek . . . . .	{ Byers' high line ditch . . . . .	June 9, 1888	Mar. 28, 1888	670,556.00 . . . . .	. . . . . Rollan Sherman, Leonard McDonnell
Byers' Reservoir No. 3 . . . . .	Bijou creek . . . . .	{ Byers' high line ditch . . . . .	June 9, 1888	Mar. 28, 1888	875,700.00 . . . . .	. . . . . Rollan Sherman, Leonard McDonnell
Byers' Reservoir No. 4 . . . . .	Bijou creek . . . . .	{ Byers' high line ditch . . . . .	June 9, 1888	Mar. 28, 1888	2,870,000.00 . . . . .	. . . . . Rollan Sherman, Leonard McDonnell
Byers' Reservoir No. 5 . . . . .	Bijou creek . . . . .	{ Byers' high line ditch . . . . .	June 9, 1888	Mar. 28, 1888	3,932,286.00 . . . . .	. . . . . Rollan Sherman, Leonard McDonnell
Byers' Reservoir No. 6 . . . . .	Bijou creek . . . . .	{ Byers' high line ditch . . . . .	June 9, 1888	Mar. 28, 1888	6,996,000.00 . . . . .	. . . . . Rollan Sherman, Leonard McDonnell

\* Work on the Burlington ditch commenced November 29, 1885.

## WATER DISTRICT No. 2.

*Water District No. 2—Jerry McCarthy and Joseph H. Hodgson, Water Commissioners.*—Mr. McCarthy was appointed April 11, 1887, and he was succeeded May 28, 1887, by Mr. Hodgson, whose address is Denver, Colo. Water District No. 2, consists of land irrigated from ditches taking water from the South Platte river and its tributaries, excepting Big Thompson, St. Vrain and Clear creek, between the mouth of the Cache la Poudre river and the mouth of Cherry creek. A plat of this water district, prepared from the report of the water commissioner thereof, is given in Part II. of this report.

Mr. Hodgson reports for the year 1887, that he entered upon the duties of his office May 29; that he appointed Mr. Van B. Kelsey his assistant; that Mr. Kelsey served in this capacity thirty-seven days; that a rating station,\* if established at Denver, would greatly aid him in the distribution of water in his district by affording him information as to the amount of water at his disposal; that the ditches below Platteville did not require his attention, being supplied with water seeping from the ditches near Platteville, and water carried into the South Platte by the Big Thompson and St. Vrain; that if the demands for water for domestic purposes were complied with, there would remain no water in his district in times of scarcity available for irrigation; that he was greatly inconvenienced in the performance of his duties by the filling up of the heads of the ditches in his district with sand, thus vitiating the rating records furnished him by the State Engineer; that the following particulars concerning the ditches and the use made of

\*NOTE.—A station was established on the South Platte, at Denver, in 1888, and was of some service to the Commissioner of Water District No. 2. The channel of the Platte at Denver, is, however, so sandy and so subject to change, that without a considerable expenditure of money a satisfactory gauging station can not be established at this point.

the water in his district, directed by the State Engineer to be reported upon, are as accurate as it was possible to obtain them.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 2, BY  
THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Burlington ditch . . . . .	14	150		280	570
Hodgson ditch . . . . .	2	15		360	80
Beman ditch . . . . .	7½	245		1,040	675
Buckers ditch . . . . .	13	910	30		600
Dugan ditch . . . . .	3¼	100		700	550
Brantner ditch . . . . .		730	80	1,240	1,330
Fulton ditch . . . . .	21	3,345	816	1,030	3,806
Brighton ditch . . . . .	6½	550	300	800	450
Farmers' Independent ditch . . .	11	1,350		2,060	780
F. E. Wheeler ditch and Elwood } ditch combined.	3½			1,200	
Hill Side ditch . . . . .	6	401	8	60	1,015
Clear Spring ditch . . . . .	2¼			560	40
Lupton Bottom ditch . . . . .	7			1,600	500
Meadow Island ditch . . . . .	2¼			260	160
Meadow Island No. 2, ditch . . .	3			800	360
Platteville ditch . . . . .	12	468	48		808
Lower Latham ditch . . . . .	20	1,500	200	1,700	4,600
Union ditch . . . . .	13	350		500	1,650
Evans No. 2, ditch . . . . .		380		400	608

Showing that there were irrigated in Water District No. 2, from about 150 miles of ditches, 10,494 acres of alfalfa, 1,482 acres of seeded grasses, 14,590 acres of natural grasses, and 18,582 acres of crops other than grasses; making a total area cultivated in 1887 of 45,148 acres.



Mr. Hodgson reports for the year 1888 (*inter alia*), that he was first called upon to distribute water April 23; that he had been employed in the discharge of his duties eighty-three days up to the date of his report, which is August 18; that Mr. E. C. Osborne had acted as his assistant during the season last past; that there had been but a very small supply of water in the district during the season; that with the exception of a few days, from May 6 to June 4, there had never been sufficient water in the river to supply the first appropriations of the ditches drawing water therefrom; that the crops had consequently suffered; that he was not greatly troubled by the unlawful interference with head-gates after he had adjusted them; that legislative provision should be made whereby the owners or managers of ditches should be responsible for any change in their head-gates after having been set by the State officers in charge of the distribution of water; that the supply of water in the tributaries of the South Platte could be augmented at small cost by the conveyance of water by artificial channels from just below the high snow drifts on the west side of the peaks of the Continental Divide through the passes onto the eastern slope of the range; that a comparison of the report of this year with that of the previous year will show that the acreage of alfalfa is rapidly increasing, and will soon be the principal crop; that not more than one third of the land under ditches already constructed in this district is in cultivation; that the following particulars concerning the ditches and the use made of water in his district for the year 1888 is approximately correct:

STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 2, BY  
THE WATER COMMISSIONER.

NAME OF DITCH.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, oth- er than alfalfa, irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irri- gated therefrom.
Beeman . . . . .	600	300	500	1,000
Hodgson . . . . .	25		330	45
Dugan . . . . .	125		700	500
Clear Spring . . . . .			560	40
Elwood and Wheeler combined . . . . .	100		950	150
Meadow Island . . . . .	40		240	140
Meadow Island No. 2 . . . . .	100		750	310
Fulton . . . . .	3,600	816	1,030	3,550
Farmers' and Gardners . . . . .	50			167
Brighton . . . . .	740	150	900	675
Buckers . . . . .	1,406			1,107
Independent . . . . .	1,982		396	1,546
Latham . . . . .	465		815	1,334
Union . . . . .	929		1,235	2,669
Jay Thomas . . . . .	75		225	150
Hewes & Cook . . . . .	150		340	260
Big Bend . . . . .	100		290	250
Evans No. 2 . . . . .	506		530	800
Burlington . . . . .	650			1,700
Brantner . . . . .	780	420	830	1,400
Lupton Bottom . . . . .	140		1,500	460
Hill Side . . . . .	600	60		950

So that there were irrigated in Water District No. 2, during the year 1888, 13,163 acres of alfalfa, 1,746 acres seeded grasses, other than alfalfa, 12,121 acres natural grasses and 19,203 acres in crops other than grasses, making a total area irrigated of 46,233 acres.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 2,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION No. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet of water previously appropriated in district.	Order of priority in district.
Brantner ditch . . . . .	South Platte . . . . .	April 1, 1860	29.77	. . . . .	. . . . .	1
The Platteville Irrigating and Milling Co.'s ditch . . . . .	South Platte . . . . .	July 1, 1862	47.88	. . . . .	29.77	2
Farmers' and Gardeners' ditch . . . . .	South Platte . . . . .	Mar. 15, 1863	13.71	. . . . .	77.65	3
The Brantner ditch, first enlargement . . . . .	South Platte . . . . .	May 1, 1863	5.93	35.70	91.36	4
Lupton Bottom ditch . . . . .	South Platte . . . . .	May 15, 1863	47.70	. . . . .	97.29	5
Brighton ditch . . . . .	South Platte . . . . .	Dec. 1, 1863	22.22	. . . . .	144.99	6
The Duggan ditch . . . . .	South Platte . . . . .	April 1, 1864	56.85	. . . . .	167.21	7
The Fulton ditch . . . . .	South Platte . . . . .	May 1, 1865	79.70	. . . . .	224.06	8
Jay Thomas ditch . . . . .	South Platte . . . . .	June 1, 1865	104.35	. . . . .	303.76	9
Farmers' Independent ditch . . . . .	South Platte . . . . .	Nov. 20, 1865	61.60	. . . . .	408.11	10
Meadow Island ditch, No. 1. . . . .	South Platte . . . . .	May 1, 1866	26.23	. . . . .	469.71	11
Meadow Island ditch . . . . .	South Platte . . . . .	May 3, 1866	57.83	. . . . .	495.94	12
Hewes & Cook ditch . . . . .	South Platte . . . . .	May 5, 1866	27.45	. . . . .	553.77	13

Hodgson ditch . . . . .	South Platte . . . . .	April 26, 1869	12.82	. . . . .	581.22	14
Lower Latham ditch . . . . .	South Platte . . . . .	May 12, 1869	20.40	. . . . .	594.04	15
The Getz ditch . . . . .	South Platte . . . . .	May 15, 1869	5.17	. . . . .	614.44	16
Section No. 3 ditch . . . . .	South Platte . . . . .	Mar. 10, 1870	26.88	. . . . .	619.61	17
Loomis ditch . . . . .	Not given . . . . .	Dec. 8, 1870	20.70	. . . . .	646.49	18
The Platteville Irrigating and Milling Co.'s ditch, first enlargement . . . . .	South Platte . . . . .	Jan. 1, 1871	5.25	53.13	667.19	19
The Elwood ditch . . . . .	South Platte . . . . .	Mar. 10, 1871	37.60	. . . . .	672.44	20
St. Louis Colony ditch, No. 1 . . . . .	South Platte . . . . .	April 20, 1871	29.28	. . . . .	710.04	21
Patterson ditch . . . . .	South Platte . . . . .	May 1, 1871	19.92	. . . . .	739.32	22
Hewes & Cook ditch, first enlargement . . . . .	South Platte . . . . .	Aug. 10, 1871	71.12	98.57	759.24	23
Highland ditch . . . . .	South Platte . . . . .	Oct. 1, 1871	64.40	. . . . .	830.36	24
The Evans ditch, No. 2 . . . . .	South Platte . . . . .	Oct. 5, 1871	177.07	. . . . .	894.76	25
The Brighton ditch, first enlargement . . . . .	South Platte . . . . .	Nov. 1, 1871	22.58	44.80	1071.83	26
The Brantner ditch, second enlargement . . . . .	South Platte . . . . .	July 1, 1872	12.18	47.88	1094.41	27
Section No. 3 ditch, first enlargement . . . . .	South Platte . . . . .	Mar. 15, 1873	30.83	57.71	1106.59	28
The Clear Spring ditch . . . . .	Not given . . . . .	April 15, 1873	26.33	. . . . .	1137.42	29
Frederick Brothers' ditch . . . . .	South Platte . . . . .	April 20, 1873	16.32	. . . . .	1163.75	30
Lupton Bottom ditch, first enlargement . . . . .	South Platte . . . . .	Sept. 15, 1873	92.87	140.57	1180.07	31
Big Bend ditch . . . . .	South Platte . . . . .	Sept. 26, 1873	20.88	. . . . .	1272.94	32
The Platteville Irrigating and Milling Co.'s ditch, second enlargement . . . . .	South Platte . . . . .	Oct. 15, 1873	94.25	147.38	1293.82	33
Farmers' and Gardeners' ditch, first enlargement . . . . .	South Platte . . . . .	April 1, 1874	10.28	23.99	1388.07	34
Theodore Wheeler ditch . . . . .	South Platte . . . . .	April 15, 1874	13.45	. . . . .	1398.35	35

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 2.—*Concluded.*

NAME OF DITCH, CANAL, OR RESERVOIR	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to canal or reservoir.	Cubic feet of water previously appropriated in district.	Order of priority in district.
The Union ditch . . . . .	South Platte . . . . .	Nov. 5, 1874 . . . . .	100.00 . . . . .	. . . . .	1411.80 . . . . .	36
Lower Latham ditch, first enlargement . . . . .	South Platte . . . . .	Dec. 12, 1874 . . . . .	35.77 . . . . .	56.17 . . . . .	1511.80 . . . . .	37
The Elwood ditch, first enlargement . . . . .	South Platte . . . . .	April 1, 1875 . . . . .	80.48 . . . . .	118.08 . . . . .	1547.57 . . . . .	38
Theodore Wheeler ditch, first enlargement . . . . .	South Platte . . . . .	June 1, 1875 . . . . .	6.68 . . . . .	20.13 . . . . .	1628.05 . . . . .	39
Evans ditch No. 2, first enlargement . . . . .	South Platte . . . . .	Nov. 20, 1875 . . . . .	226.98 . . . . .	404.05 . . . . .	1624.73 . . . . .	40
Meadow Island ditch, first enlargement . . . . .	South Platte . . . . .	April 10, 1876 . . . . .	8.33 . . . . .	66.16 . . . . .	1861.71 . . . . .	41
Theodore Wheeler ditch, second enlargement . . . . .	South Platte . . . . .	May 10, 1876 . . . . .	21.42 . . . . .	41.55 . . . . .	1870.04 . . . . .	42
The Fulton ditch, first enlargement . . . . .	South Platte . . . . .	July 8, 1876 . . . . .	74.25 . . . . .	153.95 . . . . .	1891.46 . . . . .	43
The Mayfield ditch . . . . .	South Platte . . . . .	Oct. 15, 1876 . . . . .	15.67 . . . . .	. . . . .	1965.71 . . . . .	44
The Farmers' Independent ditch, first enlargement . . . . .	South Platte . . . . .	Nov. 20, 1876 . . . . .	85.40 . . . . .	147.00 . . . . .	1981.38 . . . . .	45
Lower Latham ditch, second enlargement . . . . .	South Platte . . . . .	Nov. 14, 1877 . . . . .	97.68 . . . . .	153.85 . . . . .	2066.78 . . . . .	46
The Beeman ditch . . . . .	South Platte . . . . .	Dec. 19, 1877 . . . . .	127.00 . . . . .	. . . . .	2164.46 . . . . .	47
The Wyatt ditch . . . . .	South Platte . . . . .	Mar. 12, 1878 . . . . .	23.63 . . . . .	. . . . .	2291.46 . . . . .	48
Buckers ditch . . . . .	South Platte . . . . .	July 8, 1879 . . . . .	121.87 . . . . .	. . . . .	2315.09 . . . . .	49
Farmer's Independent ditch, second enlargement . . . . .	South Platte . . . . .	Nov. 1, 1879 . . . . .	373.00 . . . . .	520.00 . . . . .	2436.96 . . . . .	50



The Fulton ditch, second enlargement . . . . .	South Platte . . . . .	Nov. 5, 1879	50.23	204.18	2869.96	51
The Brantner ditch, third enlargement . . . . .	South Platte . . . . .	Jan. 15, 1881	63.30	111.18	2860	52
Lower Latham ditch, third enlargement . . . . .	South Platte . . . . .	Oct. 24, 1881	133.88	287.73	2923.47	
The Union ditch, first enlargement . . . . .	South Platte . . . . .	Nov. 2, 1881	84.03	184.03	3057.37	
Side Hill ditch . . . . .	South Platte . . . . .	April 29, 1882	94.80	. . . . .	3141.40	
The Fulton ditch, third enlargement . . . . .	South Platte . . . . .	Nov. 1, 1882	244.62	448.80	3236.20	56

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 2,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Coal Creek ditch and pipe line . . . . .	Coal creek . . . . .	Oct. 24, 1887	Oct. 11, 1887	17.00	. . . . . W. A. Thompson, et al.
*The Harris Ditch and Reservoir Co.'s { ditch . . . . .	Dry creek . . . . .	Nov. 29, 1887	. . . . .	80.00	{ The Harris Ditch and Reservoir Co., C. J. Harris, President.
†Enlargement of the German Ditch { and Reservoir Co.'s ditch and res. {	Dry creek . . . . .	Dec. 3, 1887	Sept. 12, 1887	28.00	{ The German Ditch and Reservoir Co., A. Christinak, President.
‡The Smith ditch . . . . .	Dry creek . . . . .	Jan. 27, 1888	Nov. 1, 1887	70.00	. . . . . Herbert Smith et al.

\* Commencement of survey, October 2, 1887; two reservoirs to be connected therewith, having capacity of from 60,000,000 to 75,000,000 cubic feet.  
† The ditch, as originally constructed, had a capacity of 20.00 cubic feet per second, and when enlarged, 48.00 cubic feet per second. It is enlarged to supply three reservoirs, having capacities of 1,045,000, 54,450,000 and 700,000 cubic feet.  
‡ Connected therewith is a reservoir having a capacity of 20,000,000 cubic feet, and with the ditch known as "the Smith ditch and reservoir."

*Feeder from First Creek . . . . .	First creek . . . . .	Oct. 29, 1888	Oct. 15, 1888	375.00	{ The Oasis Water Supply, Park and Improvement Co., by W. E. Meek.
†Feeder from Second Creek . . . . .	Second creek . . . . .	Oct. 29, 1888	Oct. 15, 1888	750.00	{ The Oasis Water Supply, Park and Improvement Co., by W. E. Meek
‡Feeder from Third Creek . . . . .	Third creek . . . . .	Oct. 29, 1888	Oct. 15, 1888	950.00	{ The Oasis Water Supply, Park and Improvement Co., by W. E. Meek.
§Beaver Lake ditch . . . . .	{ Probably S. } { Plate riv. }	Nov. 8, 1888	June —, 1886	120.00	. . . . .

\* Supplies Oasis reservoir through Burlington ditch.

† Supplies Oasis reservoir.

‡ Statement signed by J. H. Williams, president, and Geo. H. Howe, secretary.

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# STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 2,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inch- es)	Length of case, (in feet).	DEPTH OF FLOW BELOW SURFACE.			LOCATION.	Present flow in gallons per minute.	REMARKS.
				First flow.	Second flow.	Third flow.			
E. Riethmann . . . . .	586	5	49	303	. . . .	586	Sec. 12, T. 3, R. 68 W. . .	10	. . . . .
A. E. Meek . . . . .	300	3	240	250	. . . .	300	Sec. 30, T. 1, S. R. 66 W. .	4	. . . . .
S. Brantner . . . . .	272	3	40	150	225	272	Sec. 34, T. 1, S. R. 67 W. .	12½	. . . . .
J. M. Mumford . . . . .	506	. . . .	. . . .	75	. . . .	. . . .	Sec. 3, T. 2, N. R. 69 W. . .	. . . .	. . . . .
J. Brewer . . . . .	322	3	34	150	315	. . . .	Sec. 18, T. 2, N. R. 67 W. .	. . . .	. . . . .
E. Riethmann . . . . .	318	4	204	214	218	. . . .	Sec. 1, T. 3, N. R. 68 W. . .	15	. . . . .
D. Wolport . . . . .	600	4	575	. . . .	. . . .	580	Sec. 19, T. 2, N. R. 67 W. .	60	. . . . .
A. M. Brand . . . . .	. . . .	. . . .	426	. . . .	. . . .	426	. . . . .	6	. . . . .
D. E. Young . . . . .	316	4	26	. . . .	. . . .	. . . .	Sec. 35, T. 1, N. R. 67 W. .	5	. . . . .
J. S. McCool . . . . .	155	3	155	150	. . . .	. . . .	Sec. 27, T. 1, N. R. 67 W. .	20	. . . . .
C. Towle . . . . .	561	3	225	220	460	550	Sec. 3, T. 3, N. R. 67 W. . .	50	. . . . .
George C. Griffin . . . . .	340	2½	280	220	320	. . . .	Sec. 23, T. 1, N. R. 67 W. .	3	. . . . .
J. S. Vanderlip . . . . .	300	3	30	83	135	286	Sec. 9, T. 2, N. R. 67 W. . .	5	. . . . .

## STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 2—Continued.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inches).	Length of case, (in feet).	DEPTH OF FLOW BELOW SURFACE.			LOCATION.	Present flow in gallons per minute.	REMARKS.
				First flow.	Second flow.	Third flow.			
William S. Lee . . . . .	218	2½	45	125	190		Sec. 23, T. 1, N. R. 67 W. .	2	. . . . .
G. W. Gigler . . . . .	300	3	25	85			Sec. 8, T. 2, N. R. 67 W. .	50	. . . . .
Solomon Cline . . . . .	416	3	30	416			Sec. 5, T. 2, N. R. 67 W. .	4	. . . . .
T. A. McCool . . . . .	135	2½	30	130			Sec. 27, T. 1, N. R. 67 W. .	Not given	. . . . .
William Murray . . . . .	345	3	20	140	345		Sec. 27, T. 1, N. R. 67 W. .	Not given	. . . . .
A. L. Ish . . . . .	337	2½	40	327	337		Sec. 25, T. 2, N. R. 68 W. .	60	. . . . .
George Wooley . . . . .	316	2½				316	Sec. 20, T. 2, N. R. 67 W. .	30	. . . . .
W. W. Groves . . . . .	359½	3	48	200			Sec. 25, T. 2, N. R. 64 W. .	30	. . . . .
F. P. Watson . . . . .	420	3	420			420	Sec. 35, T. 2, N. R. 64 W. .	30	. . . . .
Frank Aichelman . . . . .	350	2½	40	206			Sec. 13, T. 2, N. R. 67 W. .	Not given	. . . . .
Q. F. Wolpert . . . . .	300	3	60		300		Sec. 3, T. 2, N. R. 67 W. .	8	. . . . .
M. M. Phelps . . . . .	445	2½	57			445	Sec. 24, T. 2, N. R. 68 W. .	50	. . . . .
Mrs. R. Morris . . . . .	300	3	26	90	210		Sec. 4, T. 2, N. R. 67 W. .	40	. . . . .
Louis Sanguienette . . . . .	296	2½	32	135	175	245	Near Holden Smelter . . .	15	. . . . .
J. C. Knowles . . . . .	416	3	45	150	300		Sec. 35, T. 2, S. R. 67 W. .	90	. . . . .
Fred Riethmann . . . . .	306	3	97	265		265	Sec. 25, T. 1, S. R. 67 W. .	1	. . . . .

Mrs. C. H. Cook	302	4½	40	140	240	Sec. 31, T. 2, S. R. 67 W.	52	
J. W. Epler	408	2½	40	80	200	Sec. 36, T. 2, S. R. 68 W.	20	
Mrs. S. M. Black	315	5	30	200	206	Sec. 13, T. 1, S. R. 67 W.	1	
Theodore Lohf	145	None	None	145		Sec. 22, T. 1, S. R. 67 W.	2	
F. C. Fowler	356	3	47	145	165	Sec. 34, T. 2, S. R. 67 W.	3	{ Fourth flow at 215 ft Last flow at 252 ft
D. A. Stewart	500	3½	400	325		Sec. 32, T. 1, S. R. 66 W.	Not given	
Andrew Hagus	250	3½	35	180		Sec. 24, T. 1, S. R. 67 W.	4	
The P. L. Co. (Ltd)	858	3½, 2½	858		782	Sec. 15, T. 3, S. R. 67 W.	Not given	
H. T. Vanevery	300	3	25		300	Sec. 4, T. 2, S. R. 67 W.	Not given	
C. C. Towle	617	4	220			Sec. 6, T. 3, S. R. 67 W.	40	
Mrs. C. H. Cook	500	3½	400	180	280	Sec. 31, T. 2, S. R. 67 W.	40	
J. B. Ish	400	2¼	40		400	Sec. 25, T. 2, S. R. 68 W.	30	{ Never flowed; 75,000 gals. pumped there- from in 24 hours.
Dr. N. Wagner	724					17th and California, Denver		
I. H. Webber	338	2½, 2	120	185	245	Near Argo Park	9	
Mrs. S. M. Gleason	506	2½	35	95	300	Near Argo Park	9	
M. D. Clifford	175	2½	22	45	140	Near Holden Smelter	9	
D. A. Montague	444	3-2	57	65	133	Near Holden Smelter	90	Last flow, 400 feet
Suan Anderson	488	2½	34	125	250	Near Holden Smelter	30	
William H. Clark	381	3-2	65	100	165	Near Holden Smelter	12	Last flow, 375 feet
John Brehemy	342	2½, 1¼	241	120	214	Argo street	15	Last flow, 275 feet
Conrad Burk	338	2½, 1¼	265	75	235	Gerspatch avenue	15	Last flow, 275 feet
Mrs. E. M. Loomis	504	3-4	72	100	130	Central Park	75	Last flow, 488 feet



## STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 2—Concluded.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inch- cs).	Length of case, (in feet).	DEPTH OF FLOW BELOW SURFACE.			LOCATION.	Present flow in gallons per minute.	REMARKS.
				First flow.	Second flow.	Third flow.			
E. M. Loomis . . . . .	532	3	53	106	184	245	Near Central Park	200	Last flow, 477 feet
C. N. Campbell . . . . .	418	3	49	156	412		Sec. 16, T. 2, R. 67 W	60	
Phillip Zang & Co . . . . .	330	2½, 1¼	240	150	245	305	Argo Park	20	
P. W. Snyder . . . . .	406		43	200	400		Sec. 4, T. 1, R. 67 W	30	
Mrs. C. H. Cook . . . . .	302	4½	40	140	240		Sec. 31, T. 2, R. 67 W	52	
L. M. Morris . . . . .	300	2½	45				Sec. 4, T. 2, R. 67 W	5	
I. D. Storm . . . . .	470	3½, 2½		185	385	470	Arapahoe county	166	
C. A. Olin . . . . .	450	3.2	345	140	350		Arapahoe county	180	
William A. Hamill . . . . .	658	2	400	212	395	656		120	
John Cline . . . . .	407	3.2	200	135	245	375	Arapahoe county	30	
M. Cline . . . . .	280	3	36	172	209	260	Sec. 5, T. 2, R. 67 W	5	
B. F. Harrington . . . . .	821	3½	470	260	440	465	Sec. 33, T. 2, R. 68 W	00	
A. S. Lang . . . . .	400	1½	270	350	360		Sec. 7, T. 3, R. 68 W	15	
Public School District No. 9 . . . . .	385	1¼	265	375			Sec. 5, T. 3, R. 68 W	10	
John Wolff . . . . .	410	2	335	135	175	335	Sec. 8, T. 3, R. 68 W	125	
I. C. Knowles . . . . .	416	3	45	150	300		Sec. 35, T. 2, R. 69 W	90	

LIST OF DITCHES IN WATER DISTRICT NO. 2, RATED BY THE  
STATE ENGINEERING DEPARTMENT DURING 1887 AND 1888.

NAME OF DITCH OR CANAL.	DATE OF GAUGING.
Brantner ditch . . . . .	July 11, 1887
The Fulton ditch . . . . .	July 14, 1887
Farmers' Independent ditch . . . . .	May 31, 1888
Bucker's ditch . . . . .	June 1, 1888
The Beeman ditch . . . . .	June 1, 1888
Meadow Island ditch . . . . .	June 1, 1888
Evans Ditch No. 2 . . . . .	June 1, 1888
The Brighton ditch . . . . .	June 2, 1888
Brantner ditch . . . . .	June 2, 1888

## WATER DISTRICT NO. 3.

*Water District No. 3—John L. Armstrong, Water Commissioner.* Appointed March 12, 1887. Address, Fort Collins, Colorado.

Water District No. 3 consists of all lands irrigated from ditches taking water from the Cache la Poudre and its tributaries. A plat of this water district, prepared from the report of the water commissioner thereof, and a graphical description of the discharge of the Cache la Poudre is found in Part II. of this report.

Mr. Armstrong reports for the year 1887: That on March 24 he received the first call to divide the water in his district; that his services were needed on March 25, 26 and 29; that from April 22 to May 8 he spent thirteen days in the distribution of water; that from May 8 to June 14 there was sufficient water to supply the ditches; that on June 14 water became scarce in the tributaries of the Cache la Poudre, and on June 18 in the main stream, and so continued for the rest of the season, with exception of a few days of flood water in July; that Mr. Fred Mantz was his assistant, and was

engaged in distributing the waters of the North Fork and its tributaries; that his assistant was occupied twelve days in this work; that notwithstanding the low stage of water, by reason of opportune rains, the shortage of crops was very slight; that "the right to water for domestic use is very well in theory, but a fraud in practice;" that in almost every instance where water was allotted to the ditches for domestic use, it was used for irrigation; that some legislative provision should be made to guide the water commissioner in distributing water for domestic use; that by reason of the unjust decrees of the court, whereby greater quantities of water were decreed to ditches than the ditches could carry, it is possible, after ten or fifteen years, for these ditches to enlarge and bring under cultivation land never before irrigated, at the expense of those ditches which had actually used the water for many years for irrigation; that there are many instances of this kind in his district; that the following particulars concerning the ditches, and the use made of water in his district, are approximately correct:

NAME OF DITCH.	Length thereof in miles.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of crops, other than grasses, irrigated therefrom.
Yeager . . . . .	1			50	50
Dry Creek . . . . .	5	100	60	140	500
Pleasant Valley and L Canal . . .	18	1,100	860	300	5,500
Pioneer . . . . .	3		40	200	
Boyd & Freeman . . . . .	4	50	30	160	80
Whitney . . . . .	7	100	60	200	400
B. H. Eaton . . . . .	4	40	40	151	100
Larimer and Weld . . . . .	64	3,000	1,000	1,000	23,000
J. G. Coy . . . . .	1½			160	80

NAME OF DITCH.	Length thereof in miles.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of crops, other than grasses, irrigated therefrom.
J. R. Brown . . . . .	1			100	100
Box Elder . . . . .	4	100	50	300	200
Chamberlain . . . . .	$\frac{3}{4}$	30	10	40	20
Thomas Gill et al . . . . .	1	20		20	60
W. R. Jones . . . . .	$1\frac{1}{4}$			80	80
Josh Ames . . . . .	$2\frac{1}{2}$		50	160	100
Martin Calloway . . . . .	$1\frac{1}{2}$			80	40
N. & P. Bristol, No. 1 . . . . .	1		20	40	20
Cañon canal . . . . .	$2\frac{1}{2}$	200			
Cache la Poudre ditch . . . . .	5	200	50	100	300
Fort Collins canal . . . . .	4	100	40		200
New Mercer . . . . .	13	700	300	100	3,500
N. & P. Bristol, No. 2 . . . . .	$1\frac{1}{2}$			100	40
Union Colony Canal, No. 3 . . . . .	13	380		700	2,800
Cache la Poudre canal . . . . .	30	2,500	100	150	22,800
Burnham and Emerson . . . . .	$2\frac{1}{2}$	40	20	60	100
William Calloway, Nos. 1 and 2 . . . . .	$\frac{3}{4}$			40	30
Fletcher & Freeman . . . . .	$2\frac{1}{2}$	100	50	150	100
Chaffee ditch . . . . .	2		40	80	40
Lake canal . . . . .	14	700	100	300	3,900
W. S. Taylor . . . . .	1		40	60	60
Larimer County Canal, No. 2 . . . . .	12	1,400	600	300	4,700
A. Morgan . . . . .	$1\frac{1}{2}$			40	80
Brown Ditches, Nos. 1 to 7 . . . . .	2			60	100
Sturtevant, Nos. 1 and 2 . . . . .	1			100	60
Vandewark . . . . .	$2\frac{1}{2}$			20	40
Mitchell & Weymouth, Nos. 1 and 2 . . . . .	1			80	100
Boyd, George & Stafford . . . . .	2	50	30	80	160
Wetzler, Weymouth & Mitchell . . . . .	$1\frac{1}{2}$			40	80
Kitchell & Ladd . . . . .	$\frac{3}{4}$			40	60
A. Washburn, Nos. 1 and 2 . . . . .	1			60	80

NAME OF DITCH.	Length thereof in miles.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of crops other than grasses irrigated therefrom.
Roberts, Nos. 1 and 2. . . . .	2	15		40	50
Box Elder Reservoir Co.'s . . . . .	5	140			200
J. McNey et al. . . . .	1			40	80
Fisk ditch . . . . .	1			40	40
North Poudre canal . . . . .	25	60	50	400	1,000
Chase ditch . . . . .	1			40	40
Larimer County ditch . . . . .	58	1,500		1,500	12,000
Eagle Nest Ranch . . . . .	$\frac{3}{4}$			40	40
Emerson ditch . . . . .	1			60	40
Ogilvy . . . . .	6	200		100	800
Poudre High Line . . . . .	$4\frac{1}{2}$	200	100		80

Which shows that the number of miles of ditches in the district is  $340\frac{3}{4}$ ; that the number of acres in alfalfa irrigated therefrom is 13,025; that the number of acres in tame and seeded grasses irrigated therefrom is 3,740; that the number of acres in wild and natural grasses irrigated therefrom is 8,100; that the number of acres of all other crops irrigated therefrom is 84,030, aggregating a total area in the district of 108,895 acres, irrigated during 1887.

Mr. Armstrong made the following report for the year 1888:

FORT COLLINS, Colo., Sept. 15, 1888.

*Mr. T. O'Connell, Superintendent of Irrigation, Division No. 1, Denver, Colorado:*

DEAR SIR:—In accordance with the instructions of the State Engineer, I hereby submit the following report for the year 1888:

I was first called out on April 10, to divide the waters of the Cache la Poudre river. The call came from Lake



canal, a ditch which heads just opposite Fort Collins. I found at that time that there was only about half enough water in the stream to supply those ditches with water for domestic use which needed it for that purpose. The supply continued to be very short until the first of June, when, owing to heavy rains and a rise in the river combined, we had water enough to supply all the ditches with as much as they needed for about a week.

On the third of May, in obedience to your order No. 2, I shut off entirely those ditches which were drawing water for domestic use, and were not entitled to water for irrigation by virtue of their priorities. Four of these ditches immediately sued out injunctions in the District court; the court granted the injunctions, which were served on me on the fifth of May, ordering me to at once raise the head-gates of those ditches, so as to let into them a sufficient amount of water to supply the people under them with water for domestic use. When the cases were tried, on a motion to dissolve the injunction, the court decided that they should not be dissolved, but in three of the four cases the injunctions were modified so as to allow the ditches water for domestic use on certain days in each week—the length of time each ditch should have it being determined by circumstances. So that, until that decision is reversed by a higher court, the law in this district is that the water commissioner has no authority to shut the water out of a ditch that it needs for domestic use. If the decision of the District court is sustained by the Supreme court of the State, it seems to me that there should be some law passed this winter regulating the distribution of water for domestic use, instead of leaving it entirely to the discretion of the water commissioners.

On the eighth of June, when irrigation had fairly been resumed after the heavy rain of June 1, there was not water enough to fill all the ditches, and the supply kept falling steadily, with the exception of an occasional spurt from a heavy shower in the mountains. Take the season all through and the water was lower than it has been since 1874, and there has never been a year in the history of this valley when the necessity for water was so great.

There was a large amount of ground seeded to crops of various kinds that never got any water at all, and a great deal more that was irrigated only once, and only made from one-half to two-thirds of a crop.

The greatest amount of water that passed through the cañon this season was about 1,700 cubic feet per second, and that never lasted for twenty-four hours at a time, and the amount appropriated by the various ditches of the district is over 4,600 cubic feet per second. In ordinary years it is nothing unusual to have from 2,000 to 5,000 cubic feet per second from May 20 until July 1. I employed an assistant for twenty days during the season to divide water in the tributaries, and was occupied myself much longer than the eighty days allowed by law.

Yours, very respectfully,

J. L. ARMSTRONG.

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 3,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION No. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

## NAME OF DITCH, CANAL OR RESERVOIR.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation decrees to each or reservoir.	Cubic feet of water appropriated in district.	Order of priority in district.
The Yeager ditch . . . . .	Cache la Poudre . . . . .	June 1, 1860	24.80	. . . . .	000.00	1
Ditch of Watrous, Whedbee & Secord . . . . .	Cache la Poudre . . . . .	June 1, 1861	1.44	. . . . .	24.80	2
Dry Creek ditch . . . . .	Cache la Poudre . . . . .	June 10, 1861	11.67	. . . . .	26.24	3
Pleasant Valley and Lake canal . . . . .	Cache la Poudre . . . . .	Sept. 1, 1861	10.97	. . . . .	37.91	4
Pioneer ditch . . . . .	Cache la Poudre . . . . .	Mar. 1, 1862	12.92	. . . . .	48.88	5
Boyd & Freeman ditch . . . . .	Cache la Poudre . . . . .	Mar. 15, 1862	66.05	. . . . .	61.80	6
Whitney irrigating ditch . . . . .	Cache la Poudre . . . . .	Sept. 1, 1862	48.23	. . . . .	127.85	7
Yeager ditch (upper branch), first enlargement . . . . .	Cache la Poudre . . . . .	June 1, 1863	8.70	33.50	176.08	8
B. H. Eaton ditch . . . . .	Cache la Poudre . . . . .	April 1, 1864	29.10	. . . . .	184.78	9
Larimer and Weld irrigating canal . . . . .	Cache la Poudre . . . . .	June 1, 1864	3.00	. . . . .	213.88	10
Pleasant Valley and Lake canal, first enlargement . . . . .	Cache la Poudre . . . . .	June 10, 1864	29.63	40.60	216.88	11
Pioneer ditch, first enlargement . . . . .	Cache la Poudre . . . . .	Sept. 15, 1864	16.67	29.59	246.51	12
John G. Coy ditch . . . . .	Cache la Poudre . . . . .	April 10, 1865	31.63	. . . . .	263.18	13

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 3.—Continued.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet of water previously appropriated in district.	Order of priority in district
Ditch of John R. Brown . . . . .	Cache la Poudre . . . . .	May 1, 1865	8.00	. . . . .	294.81	14
Box Elder ditch . . . . .	Cache la Poudre . . . . .	Mar. 1, 1866	32.50	. . . . .	302.81	15
The Chamberlin private ditch . . . . .	Cache la Poudre . . . . .	April 1, 1866	14.83	. . . . .	335.31	16
Taylor & Gill ditch . . . . .	Cache la Poudre . . . . .	April 15, 1866	18.48	. . . . .	350.14	17
B. H. Eaton ditch, first enlargement . . . . .	Cache la Poudre . . . . .	June 1, 1866	3.33	32.43	368.62	18
Ditch of Watrous, Whedbee & Secord, first enlargement . . . . .	Cache la Poudre . . . . .	July 1, 1866	4.33	5.77	371.95	19
Boyd & Freeman ditch, first enlargement . . . . .	Cache la Poudre . . . . .	July 15, 1866	9.00	75.05	376.28	20
Larimer and Weld Irrigating canal, first enlargement . . . . .	Cache la Poudre . . . . .	April 1, 1867	16.67	19.67	385.28	21
Mason & Hottell mill race . . . . .	Cache la Poudre . . . . .	April 15, 1867	93.07	. . . . .	401.95	22
Box Elder ditch, first enlargement . . . . .	Cache la Poudre . . . . .	May 25, 1867	8.33	40.83	495.02	23
Ditch of Wm. R. Jones . . . . .	Cache la Poudre . . . . .	Sept. 1, 1867	15.52	. . . . .	503.35	24
Josh Ames Irrigating ditch . . . . .	Cache la Poudre . . . . .	Oct. 1, 1867	35.92	. . . . .	518.87	25
Martin Calloway ditch . . . . .	Box Elder creek . . . . .	Mar. 1, 1868	15.22	. . . . .	554.79	26
Ditch of Noah Bristol and Philo Bristol (lower) . . . . .	Box Elder creek . . . . .	Mar. 10, 1868	15.22	. . . . .	570.01	27
Cañon Canal Co. ditch . . . . .	Cache la Poudre . . . . .	Mar. 15, 1868	8.60	. . . . .	585.23	28

Ditch of Watrons, Whedbee & Second, second enlargement . . . . .	June 1, 1868	4.33	10.10	593.83	29
The Box Elder ditch, second enlargement . . . . .	July 1, 1868	11.93	52.76	598.16	30
Irrigating Ditch Co. . . . .	May 1, 1869	60.08	. . . . .	610.09	31
Fort Collins Irrigating canal . . . . .	June 1, 1869	1.67	. . . . .	672.17	32
New Mercer Ditch Co. . . . .	Sept 1, 1869	4.17	. . . . .	673.84	33
The ditch of Noah Bristol and Philo Bristol (upper)	Mar. 1, 1870	14.83	. . . . .	678.01	34
Canal No. 3 . . . . .	April 1, 1870	52.00	. . . . .	692.84	35
The Dry Creek ditch, first enlargement . . . . .	Oct. 21, 1870	14.42	26.09	744.84	36
Cache la Poudre Irrigating Co.'s ditch . . . . .	Oct. 25, 1870	110.00	. . . . .	759.26	37
Fort Collins Irrigating canal, first enlargement . . . . .	April 1, 1871	31.66	33.33	869.26	38
The Burnham & Emerson ditch . . . . .	April 1, 1871	26.00	. . . . .	900.92	39
The Wm. Calloway ditch No. 1 . . . . .	May 1, 1871	21.05	. . . . .	926.92	40
The Mill Power ditch . . . . .	July 1, 1871	160.00	. . . . .	947.97	41
Fletcher ditch . . . . .	Sept. 1, 1871	63.16	. . . . .	1107.97	42
The Whitney Irrigating ditch, first enlargement . . . . .	Sept. 10, 1871	12.95	61.18	1171.13	43
The Cache la Poudre Company's ditch, first enlargement . . . . .	Sept. 15, 1871	170.00	200.80	1184.08	44
The Larimer and Weld Irrigating canal, second enlargement . . . . .	Sept. 20, 1871	75.00	94.67	1354.08	45
Canal No. 3, first enlargement . . . . .	Oct. 1, 1871	41.00	93.00	1429.08	46
The New Mercer Ditch Co., first enlargement . . . . .	Oct. 10, 1871	8.33	12.50	1470.08	47
The Chaffee Irrigating ditch . . . . .	Mar. 15, 1872	22.38	. . . . .	1478.41	48
The New Mercer Ditch Co., second enlargement . . . . .	July 1, 1872	15.00	27.50	1500.79	49
Canal No. 3, second enlargement . . . . .	July 15, 1872	63.13	156.13	1515.79	50



## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 3—Continued.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet of water previously appropriated in district.	Order of priority in district.
Pleasant Valley and Lake canal, second enlargement . . . . .	Cache la Poudre . . . . .	July 19, 1872	16.50	57.10	1578.92	51
The Fort Collins Irrigating ditch, second enlargement . . . . .	Cache la Poudre . . . . .	July 20, 1872	33.33	66.66	1595.42	52
The B. H. Eaton ditch, second enlargement . . . . .	Cache la Poudre . . . . .	July 25, 1872	9.26	41.69	1628.75	53
The Lake canal . . . . .	Cache la Poudre . . . . .	Nov. 1, 1872	158.35	. . . . .	1638.01	54
The ditch of Wm. S. Taylor . . . . .	Cache la Poudre . . . . .	Mar. 15, 1873	28.60	. . . . .	1796.36	55
The Cañon Canal Company ditch, first enlargement . . . . .	Cache la Poudre . . . . .	Mar. 20, 1873	48.88	57.48	1824.96	56
The Larimer County Canal, No. 2 Irrigating ditch . . . . .	Cache la Poudre . . . . .	April 1, 1873	175.00	. . . . .	1873.84	57
The Cache la Poudre Irrigating Ditch Co., first enlargement . . . . .	Cache la Poudre . . . . .	May 1, 1873	20.42	82.50	2048.84	58
Canal No. 3, third enlargement . . . . .	Cache la Poudre . . . . .	May 15, 1873	16.65	172.80	2069.26	59
The ditch of Aquilla Morgan . . . . .	N. fork Cache la Poudre . . . . .	July 1, 1873	17.65	. . . . .	2085.91	60
Brown ditch No. 1 . . . . .	Fish creek . . . . .	July 1, 1873	9.38	. . . . .	2103.56	61
The Boyd & Freeman ditch, second enlargement . . . . .	Cache la Poudre . . . . .	Aug. 1, 1873	24.23	99.28	2112.94	62
Brown ditch No. 2 . . . . .	Fish creek . . . . .	Aug. 15, 1873	3.32	. . . . .	2137.17	63
Strudevaut ditch No. 1 . . . . .	Box Elder creek . . . . .	Aug. 15, 1873	10.66	. . . . .	2140.49	64
Strudevaut ditch No. 2 . . . . .	Box Elder creek . . . . .	Aug. 20, 1873	10.66	. . . . .	2151.15	65

The Fort Collins Irrigating ditch, third enlargement	Cache la Poudre	Sept. 1, 1873	63.28	129.94	2161.81	66
The Dry Creek ditch, second enlargement	Cache la Poudre	Sept. 15, 1873	12.13	38.22	2225.09	67
The Vaudewark ditch	Cache la Poudre	May 1, 1874	10.17		2237.22	68
Brown ditch No. 3	Fish creek	May 15, 1874	3.32		2247.39	69
The Mitchell and Weymouth ditch No. 1	Lone Pine creek	May 15, 1874	17.35		2250.71	70
Ditch of Andrew Boyd, et al	Fish creek	Nov. 1, 1874	15.03		2268.06	71
The Cache la Poudre Irrigating Co.'s ditch, second enlargement	Cache la Poudre	Nov. 10, 1874	184.00	464.00	2283.09	72
The Larimer and Weld Irrigating canal, third enlargement	Cache la Poudre	Jan. 15, 1875	54.33	149.00	2467.09	73
The Wm. Calloway ditch No. 2	N. fork Cache la Poudre	Jan. 28, 1875	14.16		2521.42	74
The Witzler ditch, et al	Lone Pine creek	Mar. 22, 1875	10.36		2535.58	75
The Warren Lake reservoir	Priority No. 56	April 15, 1875				76
Brown ditch No. 4	Fish creek	May 1, 1875	6.72		2545.94	77
The Kitchell & Ladd ditch	Cache la Poudre	Oct. 1, 1875	2.95		2552.66	78
Brown ditch No. 5	Fish creek	June 1, 1876	6.72		2555.61	79
Brown ditch No. 6	Fish creek	June 1, 1876	6.72		2562.33	80
The Witzler ditch, et al., first enlargement	Lone Pine creek	Mar. 1, 1877	3.00	13.36	2569.05	81
Brown ditch No. 7	Fish creek	June 1, 1877	2.85		2572.05	82
Cache la Poudre Irrigation Co.'s ditch, third enlargement	Cache la Poudre	Sept. 15, 1877	121.00	585.00	2574.90	83
The ditch of Henry Smith, et al	Cache la Poudre	April 1, 1878	7.23		2695.90	84
The Abram Washburn ditch No. 1	Cache la Poudre	April 15, 1878	9.57		2703.13	85
Roberts ditch No. 1	N. fork Cache la Poudre	April 15, 1878	5.76		2712.70	86
Box Elder Reservoir Co.'s ditch	Box Elder creek	June 18, 1878	17.50		2718.37	87

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 3—Concluded.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet of water appropriated in the previously in district.	Order of priority in district.
The Larimer and Weld Irrigating canal, fourth enlargement.	Cache la Poudre . . . . .	Sept. —, 1878	571.00	720.00	2735.87	88
Carter Cotton millrace . . . . .	Cache la Poudre . . . . .	April 1, 1879	127.30	. . . .	3306.87	89
Ditch of Abram Washburn, No. 2 . . . . .	Cache la Poudre . . . . .	April 15, 1879	15.43	. . . .	3434.17	90
The Dry Creek ditch, third enlargement . . . . .	Cache la Poudre . . . . .	July 15, 1879	12.70	50.92	3449.60	91
Pleasant Valley and Lake canal, third enlargement . . . . .	Cache la Poudre . . . . .	Aug. 18, 1879	80.83	137.93	3462.30	92
The ditch of John McKay et al. . . . .	N'th F'k Cache la Poudre . . . . .	Sept. 1, 1879	3.40	. . . .	3543.13	93
The Fisk Ditch No. 2 . . . . .	N'th F'k Cache la Poudre . . . . .	Dec. 1, 1879	10.28	. . . .	3546.53	94
Carter Cotton mill-race, first enlargement . . . . .	Cache la Poudre . . . . .	Dec. 31, 1879	37.17	164.47	3556.81	95
The Mitchell & Weymouth Ditch No. 2 . . . . .	Lone Pine creek . . . . .	Jan. 19, 1880	16.27	. . . .	3593.98	96
North Poudre Land, Canal and Reservoir Co . . . . .	N'th F'k Cache la Poudre . . . . .	Feb. 1, 1880	315.00	. . . .	3610.25	97
The New Mercer Ditch Co., third enlargement . . . . .	Cache la Poudre . . . . .	Feb. 15, 1880	136.00	163.50	3925.25	98
The Chase ditch . . . . .	N'th F'k Cache la Poudre . . . . .	July 7, 1880	21.40	. . . .	4061.25	99
The Larimer County ditch . . . . .	Cache la Poudre . . . . .	April 25, 1881	469.80	. . . .	4082.65	100
The Eagle Ranch ditch . . . . .	N'th F'k Cache la Poudre . . . . .	Oct. 1, 1881	5.02	. . . .	4552.45	101
Pleasant Valley and Lake canal, fourth enlargement . . . . .	Cache la Poudre . . . . .	Oct. 10, 1881	. . . .	. . . .	. . . .	102

The Emerson Bros.' ditch . . . . .	Lone Pine creek . . . . .	April 15, 1882	29.88	. . . . .	4602.65	103
Roberts Ditch No. 1, first enlargement . . . . .	N'th F'k Caché la Poudre	Sept. 1, 1882	4.09	. . . . .	4632.53	104

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 3,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Wallace-Brooks Irrigating Ditch No. 1.	Owl creek . . . . .	Oct. 4, 1887	Sept. 26, 1887	50.40	Jacob Wallace et al.
Wallace-Brooks Irrigating Ditch No. 2.	Owl creek . . . . .	Oct. 4, 1887	Sept. 26, 1887	12.37	Jacob Wallace et al.
Farr ditch . . . . .	Owl creek . . . . .	Oct. 14, 1887	July 15, 1887	38.36	Walter J. Farr
Virginia Dale Ditch No. 3 . . . . .	Dale creek . . . . .	Oct. 14, 1887	July 21, 1887	3.60	Seymour C. Leach
* William B. Woodruff Ditch No. 1 . . . . .	Dale creek . . . . .	Nov. 2, 1887	Aug. 6, 1887	0.56	William B. Woodruff
* William B. Woodruff Ditch No. 2 . . . . .	Dale creek . . . . .	Nov. 2, 1887	Aug. 6, 1887	0.56	William B. Woodruff
* William B. Woodruff Ditch No. 3 . . . . .	Dead Man's creek . . . . .	Nov. 2, 1887	Aug. 6, 1887	0.56	William B. Woodruff
J. B. Cook ditch . . . . .	Lone Tree creek . . . . .	Nov. 25, 1887	July 18, 1887	20.00	J. B. Cook
† The McCall Drain and Irrigating Co's ditch . . . . .	. . . . .	Dec. 3, 1887	Oct. 1, 1887	32.00	{ The McCall Drain and Irrigating Co. Eli Annis, Pres.; S. P. Bliss, Sec.
The Stephens ditch . . . . .	Spring . . . . .	Dec. 5, 1887	Nov. 3, 1887	15.70	John J. Stephens
The Mutual Consolidated Ditch and Irrigation Co.'s ditch . . . . .	{ Lone Tree and Owl creeks. }	Dec. 23, 1887	Sept. 25, 1887	34.50	{ Alex. Mead, Pres.; J. E. Davis, Sec.
† Extension to feeder to canal known as the "McCall Drain and Supply." . . . .	. . . . .	Jan. 5, 1888	. . . . .	. . . . .	{ The McCall Drain and Irrigation Co. Eli Annis, Pres.; S. P. Bliss, Sec.
Arthur Lateral ditch . . . . .	Spring creek . . . . .	Jan. 20, 1888	Jan. 2, 1888	25.00	Frederick W. Sherwood
Arapahoe ditch . . . . .	Arapahoe creek . . . . .	Jan. 27, 1888	Jan. 25, 1888	12.00	W. W. Spaulding, R. B. Spaulding



No. 1 . . . . .	Box Elder creek . . . . .	Feb. 21, 1888	Feb. —, 1888	33.75	. . . . . Thomas B. Webster
The Sand Creek Supply and Irrigation } System.	Sand creek . . . . .	Feb. 28, 1888	Dec. 1, 1887	6.50	. . . . . J. E. Davis
‡The Childs ditch . . . . .	. . . . .	May 30, 1888	April 25, 1888	9.10	. . . . . Francis L. Childs
The Homes ditch . . . . .	Lone Tree creek . . . . .	May 15, 1888	Mar. 1, 1888	13.00	. . . . . C. N. Homes
¶The Valley ditch . . . . .	Lone Tree creek . . . . .	July 9, 1888	May 8, 1888	8.00	. . . . . Frank Ward, Louise A. Mead
**The Valley ditch . . . . .	Lone Tree creek . . . . .	July 9, 1888	May 8, 1888	8.00	. . . . . Frank Ward, Louise A. Mead
The Wadlin & Lunt ditch . . . . .	Owl creek . . . . .	Sept. 17, 1888	Aug. 28, 1888	93.75	. . . . . Charles M. Lunt, J. M. G. Wadlin
Falls ditch . . . . .	Elk Horn creek . . . . .	Oct. 6, 1888	Aug. 15, 1886	5.00	. . . . . F. M. Smith, D. F. Smith

†This feeder is extended about 300 rods.

‡This ditch draws its water from the Cache la Poudre Canal No. 2.

¶This ditch is on the east side of Lone Tree creek.

\*\*This ditch is on the west side of Lone Tree creek.

\*The statement including these ditches was filed under the title of William B. Woodruff's Ditches Nos. 1, 2 and 3, and the capacity of each was therein stated as 972 cubic inches.

†The McCall Drain and Irrigation Company's system of ditches draws water from the arroyos, *i. e.*, seepage and drainage water.

LIST OF DITCHES IN WATER DISTRICT No. 3, RATED BY THE STATE  
ENGINEERING DEPARTMENT DURING 1888.

NAME OF DITCH OR CANAL.	DATE OF GAUGING.	REMARKS.
The New Mercer ditch . . . . .	May 26, 1888 . . . . .	
Fort Collins Irrigating canal . . . . .	May 26, 1888 . . . . .	
The Larimer County Canal No. 2 . . . . .	May 26, 1888 . . . . .	
North Poudre Land, Canal and Reservoir } Company's ditch . . . . .	May 28, 1888 . . . . .	
The Larimer and Weld Irrigating canal . . . . .	May 29, 1888 . . . . .	
The Larimer County ditch . . . . .	May 30, 1888 . . . . .	
Cache la Poudre Irrigating Company's canal . . . . .	May 30, 1888 . . . . .	
The Union Canal No. 3 . . . . .	May 30, 1888 . . . . .	Rating not reliable
The Lake canal . . . . .	May 30, 1888 . . . . .	

## WATER DISTRICT No. 4.

*Water District No. 4—George W. Little and W. A. Bean, Water Commissioners.* Mr. Little was appointed March 4, 1886; Mr. Bean was appointed May 25, 1888, after the resignation of Mr. Little. Address, Loveland, Colorado.

Water District No. 4 consists of all land irrigated from ditches taking water from the Big Thompson and its tributaries.

A plat of this district, prepared from the report of the water commissioner thereof, and a graphical presentation of the discharge of the Big Thompson are given in Part II. of this report.

Mr. Little reports for the year 1887, among other things, that he was called upon to perform the duties of his office on the thirteenth day of April; that his duties as commissioner ceased on the tenth day of October, and that the number of days he was so employed was sixty-eight; that his assistant was employed three days; that he received assistance from the superintendents of ditches

and farmers in securing the statistics hereinafter given; that perhaps not one-thousandth part of the water claimed for domestic purposes is ever used for that purpose; that in his district the distribution of water for domestic use, in times of scarcity, benefits the ditches more recently constructed at the expense of the older ditches, for the reason that the more recently constructed ditches extend further up the stream and out on to the highlands, while the older ditches head lower down on the stream and only cover the bottom lands, so that in the distribution of water the higher ditches get the pure water of the stream, while the lower ditches get the seepage water from these higher ditches, which is alkaline; that the following particulars concerning the ditches and the use made of water in his district are as nearly accurate as he was able to obtain, though as many of the farmers irrigated from more than one ditch, the crops may not in all cases be credited to the proper ditch.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 4,  
BY THE WATER COMMISSIONER

NAME OF DITCH.	Length thereof in miles.	Number of acres of alfalfa irrigated therefrom.	Number of acres in seeded grasses, other than alfalfa, irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Big Thompson ditch . . . . .	8	246	180	1,040	360
Big Thompson Manufacturing Co. ditch . . . . .	6	500	602	620	1,390
Farmers' Irrigating canal . . . . .	13	141	30	30	1,682
Big Thompson Irrigating ditch . . . . .	4½	50	35	510	240
Loveland and Greeley canal . . . . .	41	3,296		1,340	7,054
Big Thompson and Platte River ditch . . . . .	(in. br.) 7¾	97		950	765
Kist & Goss ditch . . . . .	4	8	59	30	30
W. R. Blower, No. 2 ditch . . . . .	5	90		175	110
Hill & Brush ditch . . . . .	4½			550	355
Culver & Mahoney ditch . . . . .	4½	110		250	90
Osborne & Caywood ditch . . . . .	3	20		35	114
Lykens ditch . . . . .	2	24			25
W. R. Blower ditch . . . . .	1½		24		
Jim Elgin ditch . . . . .	3½	51		15	159
Loudon Irrigating Canal . . . . .	23	1,564	200	190	7,914
Geo. Kist ditch . . . . .	12	175	860	350	500
Hillsborough ditch . . . . .	14	553	223	264	4,419
Meining ditch . . . . .	3				80
Boulder and Larimer County T. and } Manufacturing ditch and reservoir }	8	55	60	47	605
Handy ditch . . . . .	20	1,106	162	338	9,810
Wild's ditch . . . . .	2	15		190	30
South Side ditch . . . . .	12½	200		285	925
Home Supply and H. S. Reservoir ditches . . . . .	32	1,470	215	450	13,081
Selser ditch . . . . .	1	34			40
Burnside ditch . . . . .	1	6			10

So that there was, approximately, irrigated from  $236\frac{2}{3}$  miles of ditches in this district during the year 1887, 9,811 acres of alfalfa, 2,650 acres of seeded grasses, 7,659 acres of natural or wild grasses, and 49,788 acres of other crops; making a total of 69,908 acres.

Mr. Bean reports for the year 1888, among other things, that he commenced work April 16; that up to the time of his report, November 4, he had served ninety-five days; that he had found six and one-half per cent. of the appropriation decreed to the ditches to be sufficient for the domestic use of those dependent upon the ditches for water for this purpose, if they would not use the water allotted for domestic purposes to irrigate with; that he had found that by allotting to ditches for domestic purposes solely, about sufficient water to run through the ditches, and inducing the ditch superintendents to rotate the water, so allowed, to different laterals upon different days, there was less loss of water than by allotting to the ditches sufficient water to flow through the ditch and all its laterals for two days, and then permit the bed of the ditch to dry up during the succeeding five days of the week.



## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 4,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER  
PREVIOUS TO DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second	NAME OF CLAIMANT
*George Risk ditch (enlargement)	{ Big Thompson creek. }	Oct. 22, 1888	Aug. 1, 1888	38.00	{ The Consolidated Home Supply Ditch and Reservoir Co., E. K. C. Evans, president. }

\*Capacity before enlargement, 195 cubic feet per second; capacity after enlargement, 233 cubic feet per second.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 4,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER  
PREVIOUS TO DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
Mariano reservoir. . . . .	{ Thompson Big creek.	G. D. Risk . . .	Oct. 22, 1888	Aug. 1, 1888	200,000,000	{ The Consolidated Home Supply Ditch and Reservoir Co., E. K. C. Evans, president.

## STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 4,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER  
PREVIOUS TO DECEMBER 1, 1888.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inch- es).	Length of case, (in feet).	DEPTH OF FLOW BE- LOW SURFACE.			LOCATION.	Present flow in gallons per minute.	REMARKS.
				First flow.	Second flow.	Third flow.			
J. L. Herzinger . . . . .	2,462	2	1,365	1,365	. . . . .	. . . . .	Sec. 13, T. 5 N., R. 69 W . . . . .	1	. . . . .

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 4,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION NO. 1, FROM THE CERTIFIED COPY OF THE DECEES GOVERNING APPROPRIATIONS IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

## WATER DISTRICT NO. 4.

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NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet of water appropriated in district.	Order of priority in district.
The Osborne & Caywood ditch . . . . .	Little Thompson creek. . . . .	June 1, 1861	3.12	. . . . .	000.00	1
The Big Thompson ditch . . . . .	Big Thompson creek. . . . .	Nov. 10, 1861	96.50	. . . . .	3.12	2
The Big Thompson Ditch and Manufacturing Co.'s ditch . . . . .	Big Thompson creek. . . . .	April 1, 1863	34.02	. . . . .	99.62	3
The Mariano ditch . . . . .	Big Thompson creek. . . . .	May 1, 1863	3.12	. . . . .	133.64	4
The Big Thompson Ditch and Manufacturing Co.'s ditch, first enlargement } . . . . .	Big Thompson creek. . . . .	May 1, 1864	37.01	71.03	136.76	5
The Farmers' Irrigating canal . . . . .	Big Thompson creek. . . . .	May 1, 1864	5.72	. . . . .	173.77	
The Big Thompson Irrigating ditch . . . . .	Big Thompson creek. . . . .	Feb. 25, 1865	78.00	. . . . .	179.49	6
The Loveland and Greeley canal . . . . .	Big Thompson creek. . . . .	Oct. 20, 1865	18.56	. . . . .	257.49	7
The Loveland and Greeley canal (branch) . . . . .	Big Thompson creek. . . . .	Nov. 1, 1865	8.36	26.92	276.05	8
The Big Thompson and Platte River ditch . . . . .	Big Thompson creek. . . . .	Nov. 18, 1865	35.00	. . . . .	284.41	9
The Rist & Goss ditch . . . . .	Big Thompson creek. . . . .	Mar. 20, 1866	6.41	. . . . .	319.41	10
The W. R. Blower No. 2 ditch . . . . .	Little Thompson creek. . . . .	May 1, 1866	6.24	. . . . .	325.82	11

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 4—Continued.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet of water appropriated in district.	Order of priority in district.
The Hill & Brush ditch . . . . .	Big Thompson creek. . .	June 30, 1866	61.80	. . . . .	332.06	12
The Big Thompson Ditch and Manufacturing Co.'s ditch, second enlargement . . . . .	Big Thompson creek. . .	Mar. 1, 1867	65.47	136.50	393.86	13
The Culver & Mahoney ditch . . . . .	Little Thompson creek. .	April 15, 1867	19.50	. . . . .	459.33	14
The Loveland and Greeley canal, first enlargement . . . . .	Big Thompson creek. . .	June 1, 1867	12.06	38.98	478.83	15
The Lykens ditch . . . . .	Little Thompson creek. .	May 1, 1868	1.17	. . . . .	490.89	16
The Farmers' Irrigating canal, first enlargement . . . . .	Big Thompson creek. . .	June 1, 1868	2.60	8.32	492.06	17
The W. R. Blower Ditch No. 1 . . . . .	Little Thompson creek. .	April 1, 1869	27.30	. . . . .	494.66	18
The Lykens ditch, first enlargement . . . . .	Little Thompson creek. .	May 3, 1869	4.03	5.20	521.96	19
The Jim Eglin ditch . . . . .	Little Thompson creek. .	May 31, 1869	.18	. . . . .	525.99	20
The Loveland and Greeley canal, second enlargement . . . . .	Big Thompson creek. . .	Oct. 20, 1870	39.04	78.02	526.17	21
The Loudon Irrigating canal . . . . .	Big Thompson creek. . .	Oct. 1, 1871	40.00	. . . . .	565.21	22
The Jim Eglin ditch, first enlargement . . . . .	Little Thompson creek. .	April 15, 1872	3.46	3.64	605.21	23
The Big Thompson Ditch and Manufacturing Co.'s ditch, third enlargement . . . . .	Big Thompson creek. . .	May 1, 1872	9.75	146.25	608.67	24
The George Rist ditch . . . . .	Big Thompson creek. . .	May 1, 1873	195.00	. . . . .	618.42	25
The Loveland and Greeley canal, third enlargement . . . . .	Big Thompson creek. . .	June 23, 1873	19.93	97.95	813.42	26



The Loveland and Greeley canal, fourth enlargement . . . . .	Big Thompson creek . . . . .	Oct. 25, 1873	35.50	133.45	833.35	27
The Kirchner ditch . . . . .	Buckhorn creek . . . . .	June 1, 1874	6.81	. . . . .	868.85	28
The Perkins ditch . . . . .	Buckhorn creek . . . . .	June 15, 1874	2.60	. . . . .	875.66	29
The Hillsborough ditch . . . . .	Big Thompson creek . . . . .	Oct. 15, 1874	8.25	. . . . .	878.26	30
The Meinung ditch . . . . .	Little Thompson creek . . . . .	Dec. 20, 1874	1.40	. . . . .	886.51	31
The Osborne & Caywood ditch, first enlargement . . . . .	Little Thompson creek . . . . .	Mar. 10, 1875	16.64	19.76	887.91	32
The Rist & Goss ditch . . . . .	Big Thompson creek . . . . .	April 15, 1875	86.07	86.48	904.55	33
The Culver & Mahoney ditch, first enlargement . . . . .	Little Thompson creek . . . . .	April 30, 1875	19.50	39.00	984.62	34
The Boulder and Larimer County Irrigating and Manu- facturing ditch and reservoir. } . . . . .	Little Thompson creek . . . . .	June 30, 1875	27.20	. . . . .	1004.12	35
The W. R. Blower Ditch No. 1, first enlargement . . . . .	Little Thompson creek . . . . .	May 1, 1876	17.63	44.93	1031.32	36
The Big Thompson and Platte river ditch, first enlargement . . . . .	Big Thompson creek . . . . .	May 15, 1876	86.18	121.18	1048.95	37
The Eagle ditch . . . . .	Little Thompson creek . . . . .	Mar. 1, 1877	15.60	. . . . .	1155.13	38
The Boulder and Larimer County Irrigating and Manu- facturing ditch and reservoir, first enlargement. } . . . . .	Little Thompson creek . . . . .	May 20, 1877	39.52	66.72	1150.73	39
The London Irrigating canal, first enlargement . . . . .	Big Thompson creek . . . . .	Nov. 1, 1877	154.30	194.30	1190.25	40
The Handy ditch . . . . .	Big Thompson creek . . . . .	Feb. 28, 1878	31.20	. . . . .	1344.55	41
The Hillsboro ditch, first enlargement . . . . .	Big Thompson creek . . . . .	April 15, 1878	99.46	107.71	1375.75	42
The Farmers' Irrigating canal, second enlargement . . . . .	Big Thompson creek . . . . .	Aug. 1, 1878	54.08	62.40	1475.21	43
The Loveland and Greeley canal, fifth enlargement . . . . .	Big Thompson creek . . . . .	Nov. 1, 1878	15.20	148.65	1529.29	44
The Supply Lateral ditch . . . . .	Little Thompson creek . . . . .	Nov. 30, 1878	35.57	. . . . .	1544.49	45
The Neville ditch . . . . .	Buckhorn creek . . . . .	April 25, 1879	3.12	. . . . .	1580.06	46
The Perkins ditch, first enlargement . . . . .	Buckhorn creek . . . . .	June 15, 1879	.50	3.10	1583.18	47
The Buffum ditch . . . . .	Buckhorn creek . . . . .	June 28, 1879	2.60	. . . . .	1583.68	48

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 4—Concluded.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each or ditch, canal or reservoir.	Cubic feet of water previously appropriated in district.	Order of priority in district.
The South Side ditch . . . . .	Big Thompson creek . . . . .	Nov. 7, 1880	50.30	. . . .	1586.28	49
The Handy ditch, first enlargement . . . . .	Big Thompson creek . . . . .	Dec. 15, 1880	141.23	172.43	1636.58	50
The Loveland and Greeley canal, sixth enlargement . . . . .	Big Thompson creek . . . . .	April 1, 1881	297.44	446.09	1777.81	51
The Perkins ditch, second enlargement . . . . .	Buckhorn creek . . . . .	June 9, 1881	4.47	7.57	2075.25	52
The Home Supply ditch . . . . .	Big Thompson creek . . . . .	July 15, 1881	278.84	. . . .	2079.72	53
The Hillsboro ditch, second enlargement . . . . .	Big Thompson creek . . . . .	Oct. 6, 1881	45.69	153.40	2358.56	54
The Loudon Irrigating canal, second enlargement . . . . .	Big Thompson creek . . . . .	Sept. 17, 1883	123.48	317.78	2404.25	55

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 4,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION No. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF AP- PROPRIATION.	Capacity of res- ervoir in cubic feet	Cubic feet of wa- ter per second appropriated to each priority.	Summation of appropriations to each reser- voir.	Cubic feet of wa- ter previously appropriated.	Order of priority in district.
The Rist reservoir . . . . .	Big Thompson creek . .	Sept. 15, 1874	. . . . .	. . . . .	. . . . .	. . . . .	1
The Mariano reservoir . . . . .	Big Thompson creek . .	Oct. 1, 1875	. . . . .	. . . . .	. . . . .	. . . . .	2
Bennett's reservoir . . . . .	} St. Vrain creek and Lit- tle Thompson creek. }	Feb. 25, 1880	. . . . .	. . . . .	. . . . .	. . . . .	3
The Big Thompson reservoir . . . . .	Big Thompson creek . .	May 18, 1881	. . . . .	. . . . .	. . . . .	. . . . .	4
The Farwell reservoir . . . . .	Big Thompson creek . .	Aug. 31, 1881	. . . . .	. . . . .	. . . . .	. . . . .	5

LIST OF DITCHES IN WATER DISTRICT No. 4, RATED BY THE STATE  
ENGINEERING DEPARTMENT DURING 1888.

NAME OF DITCH OR CANAL.	DATE OF GAUGING.
The Handy ditch . . . . .	May 23, 1888
The Home Supply ditch . . . . .	May 23, 1888
The South Side ditch . . . . .	May 24, 1888
The Loudon Irrigating canal . . . . .	May 24, 1888
The Old Barnes ditch, (branch of the Loveland and Greeley canal) . . . . .	May 24, 1888
The Loveland and Greeley canal . . . . .	May 24, 1888
The Farmers' Irrigating canal . . . . .	May 24, 1888
The Hillsborough ditch . . . . .	May 25, 1888

## WATER DISTRICT No. 5.

*Water District No. 5—George L. Beckwith, Water Commissioner.* Appointed May 24, 1887. Post-office address, Longmont, Colorado.

Water District No. 5 consists of lands irrigated by water taken from the St. Vrain and its tributaries, except the Boulder, its tributaries, and Coal creek.

A plat of this water district, prepared from the report of the water commissioner thereof, together with a graphical presentation of the discharge of the St. Vrain, is found in Part II. of this report.

Mr. Beckwith reports, for the year 1887 (*inter alia*), that he was engaged in the distribution of water twenty-three days in June, twenty-two days in July, sixteen days in August, ten days in September, seven days in October, and two days in November, in all eighty days; that the period of eighty days to which the water commissioners are limited is too short a time for the requirements of his district; that, by reason of the increased area of seeded grasses cultivated, there has arisen a

demand for water from early in the spring until late in the fall; that the owners of ditches can neither be induced nor compelled to put rating flumes in their ditches, thereby occasioning the commissioner a great and unnecessary loss of time in distributing the water, and that the following statistics concerning ditches, and the use made of water in his district are as nearly correct as he could secure:



STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 5,  
BY THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of crops other than grasses irrigated therefrom.
Left Hand . . . . .	30	1,000		8,000	12,000
Highland . . . . .	35	1,600	400	3,000	15,000
Supply . . . . .	23	500	100	2,000	5,400
Rough and Ready . . . . .	18	1,000	200	2,000	3,000
Palmerton . . . . .	6	400	100	1,000	1,500
Longmont Supply . . . . .	10	600	150	550	1,200
Chapman & McCaslin . . . . .	4	100		600	200
Oligarchy . . . . .	18	1,000	200	2,000	4,000
Zweck & Turner . . . . .	2½	100		300	200
Ni-Wot . . . . .	5	250		300	300
Bonus . . . . .	3	100		400	300
James . . . . .	10	300		400	800
Pella . . . . .	6	200	100	300	900
South Flat . . . . .	4	100		400	300
Beckwith . . . . .	3	100		300	200
Denio & Taylor . . . . .	5	75		500	200
Coffman . . . . .	1½	10		250	50
Dickens . . . . .	1½	1		150	10
Island . . . . .	½			75	25
Cushman . . . . .	½			50	10
Last Chance . . . . .	6	200		1,000	800
Hayseed . . . . .	2			300	100
Coffin & Davis . . . . .	2			200	100
Davis & Downing . . . . .	3	300			400
Swede . . . . .	6	300		1,000	2,000
Ditches in river bottom not enumerated in the above. }	20	100		2,000	1,000

Showing that the waters of the St. Vrain and its tributaries were distributed through 225½ miles of

ditches, and irrigated in 1887, 8,335 acres of alfalfa; 1,250 acres of seeded grasses other than alfalfa; 27,075 acres of natural grasses, and 49,995 acres of crops other than grasses, amounting in all to 86,655 acres.

Mr. Beckwith reports for the year 1888 (*inter alia*), that he was engaged in the distribution of water for the period of eight days, commencing April 10; that on April 10 there was not sufficient water in his district to supply the demands for water for domestic use; that on April 28 heavy rains thoroughly soaked the ground, and the waters of the streams were devoted to the filling of reservoirs from that time until the water was needed for irrigation in the early part of June; that during this period all the reservoirs in his district were filled, and more could have been filled had they existed; that the supply of water for the irrigation of crops during June and July was only about fifty per cent. of what it had been during the same month of previous years; that he was seriously inconvenienced in the distribution of water by parties raising their head-gates after he had adjusted them; that he had parties arrested for unlawfully raising the gates and taking water to which they were not entitled; that these parties were bound over to appear before the grand jury, but were not indicted; that notwithstanding the drouth, more than an average crop was raised throughout his district; that the opportune fall of rains made up for the scarcity of water in the streams to some extent; that the amount of water appropriated to the ditches in the district is about two thousand eight hundred and fifty-four cubic feet per second, while the supply in ordinary seasons will hardly, it is thought, exceed one-fourth of that amount; that many ditches have decrees for a much greater quantity of water than they can carry; that if these ditches shall be enlarged and extended, they will be in condition to demand, and the water commissioner be obliged to dis-

tribute to them, the appropriations specified in the decree, which would deprive later ditches, which have been using water for ten or more years, of the water they had actually applied to beneficial use; that the decree for this district expresses the quantity of water appropriated by the ditches in *customary inches*; that there should be a readjudication and a decreeing of water to the ditches in amounts expressed in cubic feet per second, as required by law; that the meaning of the term *domestic use* should be defined by the legislature, and that the amount of water lost to beneficial use by distributing it for domestic purposes would irrigate a very considerable portion of the district.

The following is a *Tabulated Statement Relating to the Ditches in Water District No. 5*, prepared by the Superintendent of Irrigation of Water Division No. 1, from the certified copy of the decree governing the appropriations of water in this district, furnished him by the clerk of the District court. In the statement the quantities of water decreed are expressed in *cubic feet per second*, though expressed in the decree in *customary inches*. By a customary inch, it seems to have been meant one square inch of the cross-section of the ditch. The grade of the ditch was given in the decree, though not the form of cross-section. In the calculations to determine the equivalent of customary inches in cubic feet per second, the form of cross-section of the ditch had to be assumed. The results then, of course, only approximate the quantities of water which it was intended to decree to the different ditches, but which are so indefinitely expressed that they can not be determined. For it is evident that two ditches may have the same number of square inches in their cross-section, say 800 square inches, yet, if one of the ditches were eighty inches wide and ten inches deep, and the other forty inches wide and twenty inches deep, other things being equal, the capacity of the latter would materially exceed that of the former.

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 5,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION NO. 1, FROM THE CERTIFIED COPY OF THE  
THE DECREE GOVERNING APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE  
DISTRICT COURT.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF AP- PROPRIATION.	Cubic feet of wa- ter per second decreed to each priority.	Summation of decrees to canal or ditch, canal or reservoir.	Cubic feet per sec- ond previously appropriated in district.	Order of priority in district.
The Hayseed ditch . . . . .	St. Vrain creek . . . . .	Jan. 1, 1860	41.54	. . . . .	000.00	1
The Claim of James R. Mason . . . . .	St. Vrain creek . . . . .	July 30, 1860	5.45	. . . . .	41.54	2
The Cochran ditch . . . . .	Left Hand creek . . . . .	Sept. 1, 1860	.32	. . . . .	46.99	3
N. W. M. L. Ins. Co.'s claim . . . . .	Left Hand creek . . . . .	Dec. 31, 1861	3.96	. . . . .	47.31	4
The Beckwith ditch . . . . .	St. Vrain creek . . . . .	Mar. 8, 1861	14.21	. . . . .	51.27	5
The Bonus ditch . . . . .	St. Vrain creek . . . . .	Mar. 30, 1861	12.73	. . . . .	65.48	6
The Hornbaker ditch . . . . .	Left Hand creek . . . . .	May 15, 1861	3.88	. . . . .	78.21	7
Bacon's Appropriation . . . . .	St. Vrain creek . . . . .	June 1, 1861	37.37	. . . . .	82.09	8
The Cushman ditch . . . . .	St. Vrain creek . . . . .	June 20, 1861	13.45	. . . . .	119.46	9
Chapman & McCaslin ditch . . . . .	St. Vrain creek . . . . .	Mar. 10, 1862	98.13	. . . . .	132.91	10
Pella ditch . . . . .	St. Vrain creek . . . . .	Mar. 20, 1862	2.02	. . . . .	231.04	11
True & Webster ditch . . . . .	St. Vrain creek . . . . .	April 1, 1862	10.50	. . . . .	233.06	12

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 5—Continued.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
Dickens' private ditch . . . . .	St. Vrain creek . . . . .	April 15, 1862	15.47	. . . }	243.56	13
The Clough & True ditch . . . . .	St. Vrain creek . . . . .	April 15, 1862	9.11	. . . }		
Montgomery private ditch . . . . .	St. Vrain creek . . . . .	May 15, 1862	3.96	. . . }	268.14	14
The Williamson & Cavey ditch . . . . .	Left Hand creek . . . . .	May 31, 1862	2.68	. . . }	272.10	15
Smead ditch . . . . .	St. Vrain creek . . . . .	Oct. 1, 1862	16.27	. . . }	274.78	16
Clough's private ditch . . . . .	St. Vrain creek . . . . .	April 15, 1863	10.50	. . . }	291.05	17
Runyan ditch . . . . .	St. Vrain creek . . . . .	May 1, 1863	10.80	. . . }		
The Williamson & Cavey ditch, first enlargement . . . . .	Left Hand creek . . . . .	May 1, 1863	4.50	7.18	301.55	18
The Holland ditch . . . . .	Left Hand creek . . . . .	May 1, 1863	. . . . .	. . . }		
The South Flat ditch . . . . .	St. Vrain creek . . . . .	May 15, 1863	71.43	. . . }	316.85	19
The Bader No. 2 ditch . . . . .	Left Hand creek . . . . .	May 31, 1863	1.46	. . . }	388.28	20
The Farmers' ditch . . . . .	Left Hand creek . . . . .	June 1, 1863	1.63	. . . }	389.74	21
The Left Hand . . . . .	St. Vrain creek . . . . .	June 1, 1863	40.77	. . . }		
The Baum & Goyn ditch . . . . .	Left Hand creek . . . . .	Sept. 26, 1863	3.96	. . . }	432.14	22
The St. Vrain and Gold Hill ditch . . . . .	St. Vrain creek . . . . .	Oct. 25, 1863	22.85	. . . }	436.10	23



Hagers' Meadow claim	St. Vrain creek	Jan. 1, 1864	2.66	.	458.95	24
The N. W. M. J., Insurance Co.'s claim	St. Vrain creek	Jan. 1, 1864	5.72	.	.	
L. H. Dickson's appropriation	St. Vrain creek	Feb. 28, 1864	9.13	.	467.33	25
The Coffman ditch	St. Vrain creek	May 30, 1864	3.96	.	476.46	26
The Bader No. 1 ditch	Left Hand creek	May 31, 1864	9.16	.	480.42	27
The Island ditch	St. Vrain creek	June 15, 1864	4.52	.	489.58	28
The Zwick & Turner ditch	St. Vrain creek	June 30, 1864	82.61	.	494.10	29
The Hornbaker ditch, first enlargement	Left Hand creek	July 15, 1864	1.70	5.58	576.71	30
The Williams & Cavey ditch, second enlargement	Left Hand creek	May 1, 1865	6.80	13.98	578.41	31
The Longmont Supply ditch	St. Vrain creek	May 1, 1865	53.37	.	.	
The Bonus ditch, first enlargement	St. Vrain creek	May 30, 1865	10.50	23.23	638.58	32
The St. Vrain and Palmerton ditch	St. Vrain creek	May 31, 1865	32.35	.	.	
The Altona ditch	Left Hand creek	May 31, 1865	2.01	.	649.08	33
The Hornbaker ditch, second enlargement	Left Hand creek	June 1, 1865	18.66	24.24	.	
The Ni-Wot ditch	St. Vrain creek	June 1, 1865	29.24	.	683.44	34
The Baker & Weese ditch	St. Vrain creek	June 1, 1865	2.80	.	.	
The Farmers ditch, first enlargement	Left Hand creek	June 15, 1865	2.03	3.66	734.14	35
The Goss Private Ditch No. 1	St. Vrain creek	June 30, 1865	25.11	.	.	
The Goss Private Ditch No. 2	St. Vrain creek	June 30, 1865	4.40	.	736.17	36
The Webster & McCaslin ditch	St. Vrain creek	July 5, 1865	13.23	.	765.68	37
Denio & Taylor ditch	St. Vrain creek	July 15, 1865	22.62	.	778.81	38
The Weese Private ditch	St. Vrain creek	Sept. 1, 1865	3.96	.	801.53	39

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 5—Continued.

NAME OF DITCH. CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
The Coffman ditch, first enlargement	St. Vrain creek	Mar. 20, 1866	9.72	13.68	895.49	40
The Holland ditch, first enlargement	Left Hand creek	May 1, 1866		1.28	815.21	41
The St. Vrain and Palmerton ditch, first enlargement	St. Vrain creek	May 31, 1866	47.70	80.05	816.49	42
The Coffin-Davis ditch	St. Vrain creek	June 1, 1866			864.19	43
The Oligarchy ditch	St. Vrain creek	June 1, 1866	43.95			
The Cochran ditch, first enlargement	Left Hand creek	June 15, 1866	8.28	8.60	908.14	44
The Table Mountain ditch	Left Hand creek	June 25, 1866	15.30		916.42	45
The Davis & Downing ditch	St. Vrain creek	Nov. 1, 1866				46
The Coffman ditch, second enlargement	St. Vrain creek	Mar 1, 1867	.89	14.57	931.72	47
The Davis & Downing ditch, first enlargement	St. Vrain creek	May 1, 1867	6.07		932.61	48
The Baum & Goyu ditch, first enlargement	Left Hand creek	May 1, 1867	6.78	10.74		
Pella ditch, first enlargement	St. Vrain creek	May 10, 1867	17.00	19.02	945.46	49
The Peck & Metcalf ditch	Dry Creek No. 2	May 15, 1867	3.57		962.46	50
The Way ditch	Left Hand creek	May 1, 1868	4.20		966.03	51
The James ditch	St. Vrain creek	June 30, 1868	8.59		970.23	52

The Rongh and Ready ditch . . . . .	St. Vrain creek . . . . .	Mar. 13, 1869	41.67	. . . . .	978.82	53
The Nelson ditch . . . . .	Dry creek . . . . .	April 1, 1869	.50	. . . . .	1020.49	54
The Ni-Wot ditch, first enlargement . . . . .	St. Vrain creek . . . . .	June 1, 1869	6.72	35.96	1020.99	55
The Davis & Downing ditch, second enlargement . . . . .	St. Vrain creek . . . . .	Mar. 15, 1870	8.73	14.80	1027.71	56
The Bader No. 2 ditch, first enlargement . . . . .	Left Hand creek . . . . .	Mar. 15, 1870	6.72	8.18		
The Toll Gate ditch . . . . .	Left Hand creek . . . . .	April 1, 1870	2.63	. . . . .	1043.16	57
The Left Hand ditch, first enlargement . . . . .	St. Vrain creek . . . . .	June 1, 1870	685.23	726.00	1045.79	58
The Farmers' ditch, second enlargement . . . . .	Left Hand creek . . . . .	Nov. 1, 1870	11.61	15.27	1731.02	59
The Oligarehy ditch, first enlargement . . . . .	St. Vrain creek . . . . .	Dec 1, 1870	98.65	142.60	1742.63	60
The Star ditch . . . . .	Left Hand creek . . . . .	April 1, 1871	25.68	. . . . .	1841.28	61
Crocker ditch . . . . .	Left Hand creek . . . . .	May 1, 1871	3.83	. . . . .	1866.96	62
The Swede ditch . . . . .	St. Vrain creek . . . . .	May 1, 1871	15.40	. . . . .		
The Coffins-Davis ditch, first enlargement . . . . .	St. Vrain creek . . . . .	June 1, 1871	. . . . .	27.05	1886.19	63
The Bear & McCorey ditch . . . . .	Dry creek . . . . .	June 1, 1871	.70	. . . . .		
The Highland ditch . . . . .	St. Vrain creek . . . . .	Nov. 30, 1871	205.46	. . . . .	1913.94	64
The James ditch, first enlargement . . . . .	St. Vrain creek . . . . .	Dec. 30, 1871	5.97	14.56	2119.40	65
The Oligarehy ditch, second enlargement . . . . .	St. Vrain creek . . . . .	Mar. 1, 1872	36.84	179.44	2125.37	66
The Last Chance ditch . . . . .	St. Vrain creek . . . . .	Mar. 15, 1872	96.94	. . . . .	2162.21	67
The Crocker ditch, first enlargement . . . . .	Left Hand creek . . . . .	May 1, 1872	14.98	18.81	2259.15	68
The Nelson ditch, first enlargement . . . . .	Dry creek . . . . .	May 10, 1872	.15	.65	2274.13	69
The Spring Creek ditch . . . . .	St. Vrain creek . . . . .	Jan. 1, 1872	1.70	. . . . .	2274.28	70
The Swede ditch, first enlargement . . . . .	St. Vrain creek . . . . .	Mar. 1, 1873	9.15	24.55	2275.95	71

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 5—Concluded.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to ditch, canal or reservoir.	Cubic feet per second appropriated in and previously in district.	Order of priority in district.
The Rough and Ready ditch, first enlargement . . . . .	St. Vrain creek . . . . .	Mar. 4, 1873	41.67	83.34	2285.13	72
The Johnson ditch . . . . .	Left Hand creek . . . . .	April 1, 1873	8.55	. . . .	2326.80	73
Fella ditch, second enlargement . . . . .	St. Vrain creek . . . . .	June 1, 1873	23.62	42.64	2335.35	74
Denio & Taylor ditch, first enlargement . . . . .	St. Vrain creek . . . . .	Oct. 15, 1873	6.78	29.40	2358.97	75
The Holland ditch, second enlargement . . . . .	Left Hand creek . . . . .	Oct. 21, 1873	69.40	70.68	2365.75	76
The Oligarchy ditch, third enlargement . . . . .	St. Vrain creek . . . . .	April 1, 1874	58.07	237.51	2435.15	77
The Lake ditch . . . . .	Left Hand creek . . . . .	April 15, 1874	8.92	. . . .	2493.22	78
The Table Mountain ditch, first enlargement . . . . .	Left Hand creek . . . . .	April 15, 1874	26.43	41.73	5.35 } 14.80 }	79
The Toll Gate ditch, first enlargement . . . . .	Left Hand creek . . . . .	May 1, 1874	2.72	5.35		
The Davis & Downing ditch, third enlargement . . . . .	St. Vrain creek . . . . .	May 1, 1874	. . . .	14.80		
The Nelson ditch, second enlargement . . . . .	Dry creek . . . . .	May 20, 1874	.55	1.20	2531.29	80
The Renner ditch . . . . .	Dry creek . . . . .	June 1, 1874	6.42	. . . .	2531.84	81
The Richardson ditch . . . . .	Dry creek . . . . .	June 15, 1874	2.70	. . . .	2538.26	82
The St. Vrain and Palmerton ditch, second enlargement . . . . .	St. Vrain creek . . . . .	June 30, 1874	84.26	164.31	2540.96	83
The Ullery ditch . . . . .	Steele gulch . . . . .	July 1, 1874	2.90	. . . .	2625.72	84

The Bear & McCorey ditch, first enlargement . . . . .	Dry creek . . . . .	Jan. 1, 1875	.46	1.16	2628.12	85
The Altona ditch, first enlargement . . . . .	Left Hand creek . . . . .	April 15, 1875	8.66	10.67	2628.58	86
The Nelson ditch, third enlargement . . . . .	Dry creek . . . . .	May 1, 1875	.81	2.01	2637.24	87
The Denio & Taylor Extension ditch . . . . .	St. Vrain creek . . . . .	June 1, 1875	11.78	. . . .	2638.05	88
The Davis & Downing ditch, fourth enlargement . . . . .	St. Vrain creek . . . . .	Oct. 1, 1876	1.44	16.24	2649.83	89
The James ditch, second enlargement . . . . .	St. Vrain creek . . . . .	April 1, 1877	12.55	27.11	2651.27	90
The Titus & Goyne ditch . . . . .	Dry creek . . . . .	April 1, 1878	6.42	. . . .	2663.82	91
The Supply ditch . . . . .	St. Vrain creek . . . . .	May 31, 1878	92.20	. . . .	2670.24	92
The Highland ditch, first enlargement . . . . .	St. Vrain creek . . . . .	June 1, 1878	23.57	229.03	2762.44	93
The Lake ditch, first enlargement . . . . .	Left Hand creek . . . . .	April 15, 1879	3.88	12.80	2786.01	94
The Toll Gate ditch, second enlargement . . . . .	Left Hand creek . . . . .	May 3, 1879	3.94	9.29	2789.89	95
The Taylor Ditch No. 1 . . . . .	Dry creek . . . . .	June 1, 1879	16.11	. . . .	2793.83	96
The Taylor Ditch No. 2 . . . . .	Second Dry creek . . . . .	June 2, 1879	18.84	. . . .	2809.94	97
The Lagerman Supply ditch . . . . .	{ Spring gulch and Left Hand creek.	Nov. 14, 1879	7.50	. . . .	2828.78	98
The Dickens Private Ditch No. 2 . . . . .	Booring Dry gulch . . . . .	April 1, 1880	11.31	. . . .	2836.28	99
Coffin Meadow ditch . . . . .	St. Vrain creek . . . . .	May 1, 1880	4.83	. . . .	2847.59	100
The Lykins Gulch ditch . . . . .	Lykins gulch . . . . .	May 15, 1881	2.02	. . . .	2852.42	101
The Bacon (Northside) ditch . . . . .	Big Hollow . . . . .	May 20, 1881	1.75	. . . .	2854.44	102



## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 5,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION No. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Order of priority in district.
The Pleasant Valley reservoir . . . . .	St. Vrain creek . . . . .	June 1, 1871 . . . . .	1
The Highland Lake reservoir . . . . .	St. Vrain creek . . . . .	May 31, 1874 . . . . .	2
The Left Hand reservoir . . . . .	Left Hand creek . . . . .	April 15, 1877 . . . . .	3
The Lagerman reservoir . . . . .	Left Hand creek, springs, gulches and sloughs . . . . .	Sept. 3, 1878 . . . . .	4
The Divide reservoir . . . . .	St. Vrain creek . . . . .	March 1, 1879 . . . . .	5
The Highland Reservoir No. 1 . . . . .	St. Vrain creek . . . . .	Nov. 15, 1879 . . . . .	6
The Knoth reservoir . . . . .	St. Vrain creek . . . . .	April 25, 1880 . . . . .	7
The Highland Reservoir No. 2 . . . . .	St. Vrain creek . . . . .	Nov. 15, 1881 . . . . .	8
The Highland Reservoir No. 3 . . . . .	St. Vrain creek . . . . .	Nov. 15, 1881 . . . . .	...

LIST OF DITCHES IN WATER DISTRICT NO. 5, RATED BY THE STATE  
ENGINEERING DEPARTMENT DURING 1888.

NAME OF DITCH.	DATE OF GAUGING.
The Rough and Ready ditch . . . . .	May 21, 1888
The Supply ditch . . . . .	May 21, 1888
The Highland ditch . . . . .	May 21, 1888
The St. Vrain and Palmerton ditch . . . . .	May 22, 1888
The Swede (Beaver) ditch . . . . .	May 22, 1888
The Longmont Supply ditch . . . . .	May 22, 1888

## WATER DISTRICT NO. 6.

*Water District No. 6—Lemuel McIntosh, Water Commissioner.* Appointed May 9, 1887. Post-office address, Boulder, Colorado.

Water District No. 6 consists of all lands irrigated by water taken from the Boulder and its tributaries and Coal creek. A plat of this water district, prepared from the report of the water commissioner thereof, and a graphical presentation of the discharge of Boulder creek are to be found in Part II. hereof.

The water commissioner of this district has failed to report the particulars concerning the ditches, and the use of water made in his district, but has stated, however, that there was more land brought under cultivation in this district during 1888 than in any previous year, and that, although there were some losses by reason of the scarcity of water, the yield in the district has been an average one.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 6,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION No. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per sec. previously appropriated in district.	Order of priority in district.
The Lower Boulder ditch . . . . .	Boulder creek . . . . .	Oct. 1, 1859	25.00	. . . . .	000.00	1
The Smith & Goss ditch . . . . .	Boulder creek . . . . .	Nov. 15, 1859	44.30	. . . . .	25.00	2
The Howell ditch . . . . .	Boulder creek . . . . .	Dec. 1, 1859	47.55	. . . . .	69.30	3
The Howard ditch . . . . .	South Boulder creek . . . . .	April 1, 1860	36.00	. . . . .	116.85	4
The McGinn ditch . . . . .	South Boulder creek . . . . .	May 1, 1860	3.19	. . . . .	152.85	5
The Jones & Donnelly ditch . . . . .	South Boulder creek . . . . .	May 1, 1860	14.36	. . . . .		
The Antrey & Eggleston ditch . . . . .	Coal creek . . . . .	June 1, 1860	4.16	. . . . .	170.40	6
The Schearer ditch . . . . .	South Boulder creek . . . . .	June 1, 1860	26.08	. . . . .		
The Anderson ditch . . . . .	Boulder creek . . . . .	Oct. 1, 1860	25.00	. . . . .	200.64	7
The Godding, Dailey & Plumb ditch . . . . .	Boulder creek . . . . .	Mar. 1, 1861	7.24	. . . . .	225.64	8
The Houck No. 2 ditch . . . . .	Boulder creek . . . . .	April 1, 1861	7.16	. . . . .	232.88	9

The Martha M. Mathews ditch . . . . .	Boulder creek . . . . .	June 1, 1861	4.60		
The N. K. Smith & Tyler ditch . . . . .	Boulder creek . . . . .	June 1, 1861	29.04		240.04
The Wm. C. Hake ditch . . . . .	Coal creek . . . . .	June 1, 1861	2.94		
The East Boulder ditch . . . . .	South Boulder creek . . . . .	April 1, 1862	102.30		276.62
The Plumb ditch . . . . .	Boulder creek . . . . .	April 1, 1862	5.10		
The Eggleston Ditch No. 2 . . . . .	Coal creek . . . . .	May 1, 1862	4.65		384.02
The Rural ditch . . . . .	Boulder creek . . . . .	May 10, 1862	22.75		388.67
The South Boulder and Bear Creek ditch . . . . .	South Boulder creek . . . . .	May 25, 1862	16.60		411.42
David H. Nichols ditch . . . . .	Boulder creek . . . . .	June 1, 1862	10.00		
M. G. Smith ditch . . . . .	Boulder creek . . . . .	June 1, 1862	15.00		
G. Berkley ditch . . . . .	Boulder creek . . . . .	June 1, 1862	15.00		
Willman, Nichols & Hahn . . . . .	Boulder creek . . . . .	June 1, 1862	10.77		
Heirs of Elizabeth Harden and S. Wellman . . . . .	Boulder creek . . . . .	June 1, 1862	21.00		428.02
Mary S. Stoddard, Robert Culver, heirs of Elizabeth Harden, } George W. Rust and Perry White.	Boulder creek . . . . .	June 1, 1862	5.00		
William Breach . . . . .	Boulder creek . . . . .	June 1, 1862	2.00		
The North Boulder Farmers' Ditch Co . . . . .	Boulder creek . . . . .	June 1, 1862	10.78		
The Green ditch . . . . .	Boulder creek . . . . .	Sept. 15, 1862	34.58		517.57
The Farmer's ditch . . . . .	Boulder creek . . . . .	Oct. 1, 1862	73.29		552.15
The Rural ditch, first enlargement . . . . .	Boulder creek . . . . .	Mar. 10, 1863	198.29		625.44
The Honck ditch No. 1 . . . . .	Boulder creek . . . . .	April 1, 1863	15.97		823.73
The Cottonwood Ditch No. 2 . . . . .	South Boulder creek . . . . .	April 15, 1863	33.70		839.70

STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 6—*Concluded.*

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second previously appropriated in district.	Order of priority in district.
The Dry Creek ditch (Davidson's)	South Boulder creek	May 1, 1863	29.95	...	873.40	21
The Green ditch, first enlargement	Boulder creek	May 1, 1863	34.58	69.16		
The Smith & Emmons ditch	Boulder creek	June 1, 1863	47.16	...	937.93	22
The North Boulder Farmers' Ditch Co., first enlargement	Boulder creek	June 1, 1863	65.00	75.78		
The Green ditch, second enlargement	Boulder creek	May 1, 1864	34.58	103.74		
The Dry Creek Ditch No. 2	South Boulder creek	May 1, 1864	69.00	...	1050.09	23
The McGinn ditch, first enlargement	South Boulder creek	May 1, 1864	...	3.19		
The Andrews & Farwell ditch	South Boulder creek	June 1, 1864	1.35	...		
The North Boulder Farmers' Ditch Co., second enlargement	Boulder creek	June 1, 1864	115.00	190.78	1153.47	24
The Carr & Tyler ditch	Boulder creek	June 1, 1864	33.73	...		
The Enterprise ditch	South Boulder creek	Feb. 1, 1865	34.08	...	1303.75	25
The Butte Mill ditch	Boulder creek	Mar. 1, 1865	110.86	...	1337.83	26
The Howell & Beaseley ditch	Boulder creek	Mar. 1, 1865	28.80	...		
The Lyner ditch	South Boulder creek	April 1, 1865	164.00	...	1477.49	27
The Godding, Dailey & Plumb ditch, first enlargement	Boulder creek	April 1, 1865	23.20	30.44		



The Delehant ditch . . . . .	Boulder creek . . . . .	May 1, 1865	37.12	. . . . .	1664.69	28
The Green ditch, third enlargement . . . . .	Boulder creek . . . . .	May 1, 1865	34.58	138.32 }		
The South Boulder and Bear Creek ditch, first enlargement . . . . .	South Boulder creek . . . . .	May 9, 1865	26.41	43.01 }	1736.39	29
The Marshallville ditch . . . . .	South Boulder creek . . . . .	June 1, 1865	14.76	. . . . .		
The McGinn ditch, second enlargement . . . . .	South Boulder creek . . . . .	June 1, 1865	14.06	17.25 }	1762.80	30
The Highland ditch, south side . . . . .	Boulder creek . . . . .	June 1, 1865	99.70	. . . . .		
The Cottonwood Ditch, No. 1 . . . . .	South Boulder creek . . . . .	April 1, 1866	15.58	. . . . .	1891.32	31
The Enterprise ditch, first enlargement . . . . .	South Boulder creek . . . . .	May 1, 1866	40.76	74.84 }	1906.90	32
The Central ditch . . . . .	South Boulder creek . . . . .	May 15, 1866	14.36	. . . . .	1947.66	33
The South ditch . . . . .	South Boulder creek . . . . .	June 1, 1866	9.16	. . . . .		
The McKenzie ditch . . . . .	Coal creek . . . . .	June 1, 1866	18.00	. . . . .	1962.02	34
The Leggett ditch . . . . .	Boulder creek . . . . .	May 1, 1868	31.35	. . . . .	1989.18	35
The South Boulder and Bear Creek ditch, second enlargement . . . . .	South Boulder creek . . . . .	May 15, 1868	54.69	97.70 }	2020.53	36
The Highland ditch (south side), first enlargement . . . . .	Boulder creek . . . . .	June 1, 1868	152.20	251.90 }	2075.22	37
The Figgkleton Ditch, No. 1 . . . . .	Coal creek . . . . .	Oct. 1, 1869	6.58	. . . . .	2227.42	38
The Taylor ditch . . . . .	Boulder creek . . . . .	April 1, 1870	10.71	. . . . .	2234.00	39
The Last Chance ditch . . . . .	Coal creek . . . . .	May 1, 1870	10.78	. . . . .	2244.71	40
The South Boulder Cañon ditch . . . . .	South Boulder creek . . . . .	May 15, 1870	26.37	. . . . .	2255.49	41
The Lower Boulder ditch, first enlargement . . . . .	Boulder creek . . . . .	June 1, 1870	97.00	122.00 }	2281.86	42
The Church ditch . . . . .	Coal creek . . . . .	Sept. 20, 1870	18.11	. . . . .	2378.86	43
The Cottonwood Ditch, No. 1, first enlargement . . . . .	South Boulder creek . . . . .	Oct. 1, 1870	36.72	52.30 }	2396.97	44
The Andrews & Farwell ditch, first enlargement . . . . .	South Boulder creek . . . . .	April 1, 1871	7.61	8.96 }	2433.69	45

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 6—Continued.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.		Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
			ter per second	priority.			
The Boulder and Weld County ditch . . . . .	Boulder creek . . . . .	May 1, 1871	59.40			2441.30	46
The South Boulder and Bear Creek ditch, third enlargement . . . . .	South Boulder creek . . . . .	May 15, 1871	129.10		226.80		
The South Boulder Cañon ditch . . . . .	South Boulder creek . . . . .	May 15, 1871	192.00			2500.70	47
The Davidson ditch . . . . .	South Boulder creek . . . . .	April 15, 1872	116.30			2821.80	48
The Kinnear ditch and reservoir . . . . .	Coal creek . . . . .	May 20, 1872	26.48			2938.10	49
The East Boulder ditch, first enlargement . . . . .	South Boulder creek . . . . .	June 1, 1872	127.20		229.50		
The South Boulder and Coal Creek ditch . . . . .	South Boulder creek . . . . .	June 1, 1872	53.55			2964.58	50
The Goodline ditch and reservoir . . . . .	South Boulder creek . . . . .	June 1, 1873	30.31				
The South Boulder and Rock Creek ditch . . . . .	South Boulder creek . . . . .	June 1, 1873	65.93			3145.33	51
The Boulder and White Rock ditch . . . . .	Boulder creek . . . . .	Nov. 1, 1873	747.28			3241.57	52
The Boulder and Left Hand Ditch Co. . . . .	Boulder creek . . . . .	Dec. 1, 1873	82.80			3988.85	53
The Four-Mile Cañon ditch . . . . .	Four-Mile Cañon creek . . . . .	April 1, 1875	76.56				
The Six-Mile Bottom ditch . . . . .	Jains gulch . . . . .	April 1, 1875	48.80			4071.65	54
North Branch of Six-Mile Bottom ditch . . . . .	Jains gulch . . . . .	April 1, 1875	48.80				
The Davidson ditch, first enlargement . . . . .	South Boulder creek . . . . .	May 10, 1875	105.05		221.35	4245.81	55

The Town of Boulder ditch . . . . .	Boulder creek . . . . .	June 17, 1875	6.19	. . . . .	4350.86	56
The Boulder and Left Hand Ditch Co., first enlargement . . . . .	Boulder creek . . . . .	April 1, 1876	163.80	246.60	4357.05	57
The Forbes ditch . . . . .	Four-Mile Cañon creek . . . . .	April 1, 1878	60.66	. . . . .	4520.85	58
The Wellman ditch . . . . .	Boulder creek . . . . .	May 1, 1878	12.74	. . . . .	4581.51	59
The Leyner ditch, first enlargement . . . . .	South Boulder creek . . . . .	June 30, 1878	31.92	195.92	4594.25	60
The Mathews ditch . . . . .	Boulder creek . . . . .	Feb. 13, 1879	60.60	. . . . .	4626.17	61
The Enterprise ditch, second enlargement . . . . .	South Boulder creek . . . . .	June 1, 1881	54.25	129.09	4686.77	62
The Revolution ditch . . . . .	Boulder creek . . . . .	Dec. 7, 1881	99.97	. . . . .	4741.02	63

LIST OF DITCHES IN WATER DISTRICT No. 6, RATED BY THE  
STATE ENGINEERING DEPARTMENT DURING 1888.

NAME OF DITCH.	DATE OF GAUGING.
The South Boulder Cañon ditch . . . . .	May 18, 1888
The South Boulder and Bear Creek ditch . . . . .	May 18, 1888
The Dry Creek No. 2 ditch . . . . .	May 18, 1888
The South Boulder and Rock Creek ditch . . . . .	May 18, 1888
The Anderson ditch . . . . .	May 19, 1888
The Farmers' ditch . . . . .	May 19, 1888
*The Lower Boulder ditch . . . . .	July 12 and 13, 1888

\*Rated by request of owners; special service.

## WATER DISTRICT No. 7.

*Water District No. 7—J. W. T. McKay and L. R. Hope, Water Commissioners.* Mr. McKay was appointed May 9, 1887; resigned June 27, 1888. Mr. Hope was appointed June 27, 1888; residence, Denver.

Water District No. 7 consists of all lands irrigated from ditches taking water from Clear creek and its tributaries. A plat of this district, prepared from the reports of the water commissioners thereof, and a graphical presentation of the discharge of Clear creek are found in Part II. of this report.

Mr. McKay reports for the season of 1888 (*inter alia*), that he served as water commissioner of this water district from April 25 until June 28, thirty days; that he served as assistant water commissioner of the district from July 20 to August 11, twenty-two days; that he served as deputy water commissioner of the district from August 27 to November 2, sixty-three days, amounting in all to one hundred and fifteen days; that on September 3, eight per cent. of the quantity of water decreed to the ditches was allotted to those ditches for domestic use which were not entitled to water for irrigation; that

on September 17, the quantity of water allowed for domestic use solely, was reduced to six per cent. of the decreed appropriations; that on September 26, the water of the streams in this district began to be rotated, commencing on the south side of Clear creek, with the Rocky Mountain, Lee, Stewart and Eskins and Agricultural ditches, then distributing the water to the Golden ditch, Church ditch and Golden canal, then to the ditches lower down on the stream; that this method of distributing the water was satisfactory to all except, perhaps, one or two parties.\*

Mr. Hope reports that the following particulars concerning the ditches, and the use made of water in this district during the season of 1888, are approximately correct.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 7,  
BY THE WATER COMMISSIONER.

NAME OF DITCH	Number of acres that can be irrigated therefrom.	Number of acres of alfa irrigated therefrom.	Number of acres of seeded grasses other than alfa irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irri- gated therefrom
Golden ditch . . . . .	7,000.00	1,250.00	550.00	400.00	2,000.00
Agricultural ditch . . . . .	15,000.00	3,000.00	5,000.00	600.00	2,400.00
Lee, Stewart & Eskins ditch . .	1,137.00	350.00	150.00	225.00	412.00
Golden City and Ralston Creek ditch . . . . .	9,500.00	1,500.00	500.00	100.00	2,900.00
McQuestion ditch . . . . .	50.00	10.00	10.00	0.00	35.00
Church's ditch . . . . .	200.00	141.00	0.00	30.00	2.00
Fisher ditch . . . . .	1,100.00	400.00	150.00	465.00	20.00
Bunny & Ballinger ditch . . .	100.00	34.00	9.00	14.00	38.00
Piquette ditch . . . . .	60.00	0.00	0.00	0.00	60.00

\*Previous to September 3, about ten per cent. of the water decreed to ditches in water district No. 7, for irrigation had been allotted for domestic use, to those ditches not entitled to water for irrigation. See discussion of this question under head of "Distribution of Water," Chapter I.



NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses oth- er than alfalfa irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irri- gated therefrom.
Hains & Ballinger ditch . . . .	60.00	30.00	5.00	20.00	4.00
Hains ditch . . . . .	50.00	5.00	5.00	5.00	4.00
Bainard & Tucker ditch . . . .	60.00	0.00	0.00	0.00	56.00
Reed ditch . . . . .	50.00	5.50	15.00	8.00	18.00
Hains & Piquette ditch . . . .	35.00	12.00	0.00	0.00	18.00
Ouelette ditch . . . . .	500.00	35.00	0.00	40.00	400.00
Juchens & Onelette ditch . . . .	120.00	0.00	0.00	0.00	120.00
Lees & Baugh ditch . . . . .	120.00	0.00	0.00	0.00	120.00
Lane ditch . . . . .	200.00	0.00	0.00	0.00	200.00
Wannemaker ditch . . . . .	3,000.00	455.00	0.00	0.00	1,500.00
Slater ditch . . . . .	20.00	0.00	0.00	0.00	20.00
Manhart ditch . . . . .	700.00	100.00	130.00	25.00	100.00
Kershaw ditch . . . . .	500.00	160.00	25.00	105.00	48.00
Clear Crk and Platte River ditch	4,600.00	1,000.00	2,700.00	50.00	350.00
Colorado Agricultural ditch . .	1,600.00	100.00	1,350.00	50.00	100.00
Sherriff (no decree) ditch . . .	10.00	0.00	0.00	0.00	10.00
Rocky Mountain ditch . . . .	9,500.00	3,000.00	1,500.00	0.00	5,000.00
Brown Island ditch . . . . .	3.00	0.00	0.00	0.00	3.00
South Side ditch . . . . .	9.00	0.00	0.00	0.00	9.00
Brown & Baugh ditch . . . . .	130.00	55.00	0.00	15.00	60.00
Lees Island ditch . . . . .	3.50	0.00	0.00	0.00	3.50
Sherick ditch . . . . .	4.00	0.00	0.00	0.00	4.00
Miles & Eskins ditch . . . . .	2.00	0.00	0.00	0.00	1.75
Reno & Juckens ditch . . . . .	1,700.00	300.00	35.00	0.00	1,000.00
Swadley ditch . . . . .	80.00	140.00	20.00	10.00	600.00
Wadsworth ditch . . . . .	200.00	3.00	0.00	45.00	147.00
Golden canal . . . . .	39,925.00	5,882.00	6,462.00	1,140.00	9,220.00
Edwards & Riden (no decree) } ditch . . . . .	75.00	4.00	2.00	5.00	60.00
Cort, Graves & Hughes ditch . .	150.00	40.00	0.00	30.00	80.00
Wolff, north ditch . . . . .	60.00	0.00	40.00	0.00	16.00

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres in alfalfa irrigated therefrom.	Number of acres in seeded grasses, oth- er than alfalfa, irri- gated therefrom.	Number of acres of natural grasses ir- rigated therefrom.	Number of acres of other crops irrigat- ed therefrom.
Wolff ditch . . . . .	125.00	0.00	0.00	15.00	100.00
*Sanderson & Slater ditch . . . . .					
†Paige Water Co. } ditch (no decree) }					
Twenty small ditches, } as per list below }					1,000.00
Totals . . . . .	98,558.00	17,711.50	18,558.00	3,397.00	28,239.25

\*Not used this season.

†Mr. Sisty said he could not estimate the acreage under the ditch.

Total number of acres irrigated in the district, 67,905.75; leaving a balance of 30,652.25 acres under ditch but not irrigated.

The following is a list of small ditches in this district of which only meager information could be obtained:

Claus & Cosh ditch.	Rhodes, Middle ditch.
Lee ditch.	Cort & Graves ditch.
Graves, north ditch.	Davis & Rand ditch.
Sayer & Lees ditch.	Rand ditch.
Wadsworth & Graves ditch.	Clark & Brown ditch.
Graves, south ditch	Rhodes, south ditch.
Swadley & Longan ditch.	North Side ditch.
Bluff ditch.	Homestead ditch.
Sanderson ditch.	Ballinger ditch.
Slater & Moody ditch.	Davis & Brown ditch.

Mr. Hope reports that some of these ditches have been abandoned, and that the best information he was able to obtain indicated that they average in length from 500 to 2,000 feet, and irrigate about 1,000 acres in miscellaneous crops.

Mr. Hope further reports that there are about 240 miles of ditches in Water District No. 7; that previous to August 25 the average number of days that water was carried therein (exclusive of twenty small ditches carrying, perhaps, 10 cubic feet per second) during 1888 was about eighty, and that the following statement shows, as closely as could be learned, the average quantity of water carried by each ditch during the time it was supplied with water previous to August 25, 1888:

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 7,  
BY THE WATER COMMISSIONER.

NAME OF DITCH	Length thereof in miles.	No. of days water was carried therein.	Average amount of water carried during season of 1888, cubic ft. per second.
Golden ditch . . . . .	13.50	110	15.00
Agricultural ditch . . . . .	28.00	120	45.00
Golden City and Ralston Creek ditch . . . . .	25.125	120	40.00
Golden canal . . . . .	43.00	120	120.00
Rocky Mountain ditch . . . . .	28.00	120	50.00
Wannamaker ditch . . . . .	8.00	120	10.00
Reno & Jachens ditch . . . . .	14.00	65	5.00
Lee, Stewart & Eskins ditch . . . . .	6.00	120	4.00
Slater ditch . . . . .	0.25	60	1.00
Slater and Sanderson ditch . . . . .	0.25		
Lees & Baugh ditch . . . . .	1.00	40	3.00
Lane ditch . . . . .	1.25	120	4.00
Jachens & Onelette ditch . . . . .	1.25	80	2.00
Mauhart ditch . . . . .	2.50	120	6.50
Kershaw ditch . . . . .	2.00	120	4.00
Clear Creek and Platte River ditch . . . . .	12.00	117	25.00
Colorado Agricultural ditch . . . . .	13.00	117	18.00
Sheriff ditch . . . . .	0.50	120	1.00
Brown's Island ditch . . . . .	0.25	40	1.00
South Side ditch . . . . .	0.63	40	1.50
Brown & Baugh ditch . . . . .	1.00	30	5.00
Lee's Island ditch . . . . .	0.25	30	0.80
Sherick ditch . . . . .	0.25	35	1.00
Miles & Eskins ditch . . . . .	1.00	90	3.00
Swadley ditch . . . . .	4.00	120	8.00
Wadsworth ditch . . . . .	5.00	120	3.00
Edwards & Riden ditch . . . . .	1.50	60	0.75
Cort, Graves & Hughes ditch . . . . .	1.75	120	1.00
Wolff, north ditch . . . . .	1.00	120	1.50

NAME OF DITCH.	Length thereof in miles.	No. of days water was carried therein.	Average amount of water carried during season of 1888, cubic ft. per second.
Wolff ditch . . . . .	1.50	120	2.00
Fisher ditch . . . . .	1.50	120	8.00
Ouelette ditch . . . . .	1.50	120	4.00
McQuestion ditch . . . . .	0.75	90	1.00
Churches ditch . . . . .	2.75	70	2.00
Bunney & Ballinger ditch . . . . .	1.25	15	2.00
Piquette ditch . . . . .	1.25	15	2.00
Hains and Ballinger ditch . . . . .	1.50	15	1.00
Hains ditch . . . . .	0.25	20	2.00
Bainard & Tucker ditch . . . . .	0.50	25	0.90
Reed ditch . . . . .	1.50	15	1.00
Hains & Piquette ditch . . . . .	2.00	50	1.50
Paige ditch . . . . .	1.50	120	1.00
Twenty small ditches aggregating approximately . . . .	6.00		

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 7,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION NO. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second previously appropriated in district.	Order of priority in district.
The Wadsworth ditch . . . . .	Clear creek . . . . .	Feb. 25, 1860	3.31	. . .	000.00	1
The Lees & Baugh ditch . . . . .	Clear creek . . . . .	May 15, 1860	5.00	. . .	3.31	2
The South Side ditch . . . . .	Clear creek . . . . .	May 16, 1860	2.00	. . .	8.31	3
Brown's Island ditch . . . . .	Clear creek . . . . .	May 19, 1860	.90	. . .	10.31	4
The Onelette ditch . . . . .	Clear creek . . . . .	May 31, 1860	15.00	. . .	11.21	5
The Wannemaker ditch . . . . .	Clear creek . . . . .	June 1, 1860	8.00	. . .	26.21	6
The Sherrick ditch . . . . .	Clear creek . . . . .	June 14, 1860	1.12	. . .	34.21	7
Lee's Island ditch . . . . .	Clear creek . . . . .	June 30, 1860	.50	. . .	35.33	8
The Golden Canal Company's ditch . . . . .	Clear creek . . . . .	July 1, 1860	39.80	. . .	35.83	9
The Manhart ditch . . . . .	Ralston creek . . . . .	Aug. 31, 1860	.80	. . .	75.63	10
The Swadley & Logan ditch . . . . .	Ralston creek . . . . .	April 10, 1861	5.50	. . .	76.43	11
The Cort, Graves & Hughes ditch . . . . .	Clear creek . . . . .	April 30, 1861	7.00	. . .	81.93	12



The Kershaw ditch . . . . .	Clear creek . . . . .	May 2, 1861	16.00	. . .	88.93	13
The Claus & Couch ditch . . . . .	Clear creek . . . . .	May 13, 1861	9.99	. . .	104.93	14
The Swadley ditch . . . . .	Clear creek . . . . .	May 14, 1861	6.00	. . .	114.83	15
The Haines ditch . . . . .	Ralston creek . . . . .	May 30, 1861	1.31	. . .	120.83	16
The Lee ditch . . . . .	Clear creek . . . . .	June 2, 1861	1.12	. . .	122.14	17
The Piquette ditch . . . . .	Ralston creek . . . . .	June 6, 1861	2.03	. . .	123.26	18
The Miles & Eskins ditch . . . . .	Clear creek . . . . .	June 11, 1861	4.00	. . .	125.29	19
The Fisher ditch . . . . .	Clear creek . . . . .	June 29, 1861	35.00	. . .	129.29	20
The Graves North ditch . . . . .	Clear creek . . . . .	June 30, 1861	1.75	. . .	164.29	21
The Clear Creek and Platte River ditch . . . . .	Clear creek . . . . .	Nov. 1, 1861	49.50	. . .	166.04	22
The Rocky Mountain ditch . . . . .	Clear creek . . . . .	May 1, 1862	9.21	. . .	215.09	23
The Brainard Tucker ditch . . . . .	Ralston creek . . . . .	May 1, 1862	2.93	. . .		24
The Slater ditch . . . . .	Clear creek . . . . .	May 16, 1862	1.86	. . .	227.23	25
The Swadley ditch, first enlargement . . . . .	Clear creek . . . . .	June 1, 1862	9.00	15.00	229.03	26
The Bunny & Ballinger ditch . . . . .	Ralston creek . . . . .	June 6, 1862	2.70	. . .	238.03	27
The Sayer & Lees ditch . . . . .	Clear creek . . . . .	June 14, 1862	7.00	. . .	240.73	28
The Maulhart ditch, first enlargement . . . . .	Ralston creek . . . . .	June 20, 1862	.20	1.00	247.73	29
The Sanderson & Slater ditch . . . . .	Clear creek . . . . .	July 1, 1862	.90	. . .	247.93	30
The Wolff ditch . . . . .	Clear creek . . . . .	July 5, 1862	3.06	. . .	248.83	31
The Wolff North ditch . . . . .	Clear creek . . . . .	July 5, 1862	2.00	. . .		32
The Wadsworth & Graves ditch . . . . .	Clear creek . . . . .	July 10, 1862	1.35	. . .	253.89	
The Lee, Stewart & Eskins ditch . . . . .	Clear creek . . . . .	April 17, 1863	2.18	. . .	255.24	

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 7—Continued.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
The Graves South ditch . . . . .	Clear creek . . . . .	May 21, 1863	3.00	. . .	257.42	33
The Bluff ditch . . . . .	Clear creek . . . . .	May 26, 1863	2.60	. . .	260.42	34
The Juchens & Onelette ditch . . . . .	Clear creek . . . . .	May 28, 1863	3.22	. . .	263.02	35
The Sanderson ditch . . . . .	Clear creek . . . . .	May 31, 1863	1.00	. . .	266.24	36
The Slater & Moody ditch . . . . .	Clear creek . . . . .	June 20, 1863	4.00	. . .	270.24	37
The McQuiston ditch . . . . .	Ralston creek . . . . .	June 25, 1863	1.30	. . .	271.24	38
The Rhodes Middle ditch . . . . .	Clear creek . . . . .	Aug. 1, 1863	3.00	. . .	272.54	39
The Clear Creek and Platte River ditch, first enlargement . . . . .	Clear creek . . . . .	Nov. 5, 1863	20.56	70.06	275.54	40
The Cort & Graves ditch . . . . .	Clear creek . . . . .	May 1, 1864	11.00	. . .	296.10	41
The Bluff ditch, first enlargement . . . . .	Clear creek . . . . .	May 27, 1864	2.40	5.00	307.10	42
The Rocky Mountain ditch, first enlargement . . . . .	Clear creek . . . . .	May 31, 1864	7.30	16.51	309.50	43
The Bunny & Ballinger ditch, first enlargement . . . . .	Ralston creek . . . . .	June 5, 1864	1.78	4.48	316.80	44
The Piquette ditch, first enlargement . . . . .	Ralston creek . . . . .	June 6, 1864	1.88	3.91	318.58	45
The Wolff ditch, first enlargement . . . . .	Clear creek . . . . .	June 14, 1864	3.78	6.84	320.46	46
The Lane ditch . . . . .	Clear creek . . . . .	June 20, 1864	11.00	. . .	324.24	47

The Mauhart ditch, second enlargement . . . . .	Ralston creek . . . . .	June 30, 1864	11.80	12.80	335.24	48
The Golden City and Ralston Creek ditch . . . . .	Clear creek . . . . .	Feb. 28, 1865	41.43	. . .	347.04	49
The Rocky Mountain ditch, second enlargement . . . . .	Clear creek . . . . .	Mar. 31, 1865	47.13	63.64	388.47	50
The Juchens & Onelette ditch, first enlargement . . . . .	Clear creek . . . . .	April 23, 1865	5.78	9.00	435.60	51
The Wolff ditch, second enlargement . . . . .	Clear creek . . . . .	May 6, 1865	2.06	8.90	441.38	52
The Swadley ditch, second enlargement . . . . .	Clear creek . . . . .	May 16, 1865	10.00	25.00	443.44	53
The Davis & Rand ditch . . . . .	Ralston creek . . . . .	May 26, 1865	5.00	}	453.44	54
The Brown & Baugh ditch . . . . .	Clear creek . . . . .	May 26, 1865	10.00			
The Clark & Brown ditch . . . . .	Ralston creek . . . . .	May 31, 1865	3.70	. . . . .	468.44	55
The Graves North ditch, first enlargement . . . . .	Clear creek . . . . .	June 13, 1865	1.86	3.61	472.14	56
The Rhodes South ditch . . . . .	Clear creek . . . . .	July 5, 1865	3.16	. . . . .	474.00	57
The Reed ditch . . . . .	Ralston creek . . . . .	Aug. 31, 1865	2.70	. . . . .	477.16	58
The Wadsworth ditch, first enlargement . . . . .	Clear creek . . . . .	Nov. 2, 1865	9.69	13.00	479.86	59
The Hains & Ballinger ditch . . . . .	Ralston creek . . . . .	May 14, 1866	2.80	. . . . .	489.55	60
The Colorado Agricultural ditch . . . . .	Clear creek . . . . .	Mar. 5, 1867	39.20	. . . . .	492.35	61
The Rand ditch . . . . .	Lyden creek . . . . .	April 27, 1867	4.00	. . . . .	522.55	62
The North Side ditch . . . . .	Clear creek . . . . .	April 30, 1867	2.00	. . . . .	526.55	63
The Lee, Stewart & Fiskins ditch, first enlargement . . . . .	Clear creek . . . . .	Feb. 23, 1868	4.30	6.48	528.55	64
The Churches ditch . . . . .	Ralston creek . . . . .	May 31, 1868	5.84	. . . . .	532.85	65
The Wannemaker ditch, first enlargement . . . . .	Clear creek . . . . .	Nov. 5, 1868	13.00	21.00	538.69	66
The Lee, Stewart & Fiskins ditch, second enlargement . . . . .	Clear creek . . . . .	Mar. 31, 1869	19.77	26.25	551.69	67
The Hains & Piquette ditch . . . . .	Ralston creek . . . . .	May 10, 1869	5.00	. . . . .	571.46	68

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 7—Concluded.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to canal or reservoir.	Cubic feet per second previously appropriated in district.	Order of priority in district.
The Reno & Juchens ditch . . . . .	Clear creek . . . . .	May 24, 1869	6.31	. . . . .	576.46	69
The Golden ditch . . . . .	Clear creek . . . . .	Feb. 11, 1871	26.00	. . . . .	582.77	70
The Lee, Stewart & Fiskins ditch, third enlargement . . . . .	Clear creek . . . . .	April 13, 1871	6.94	33.19	668.77	71
The Homestead ditch . . . . .	Ralston creek . . . . .	May 6, 1871	2.00	. . . . .	615.71	72
The Golden Canal Co's ditch, first enlargement . . . . .	Clear creek . . . . .	April 1, 1872	154.00	193.80	617.71	73
The Rocky Mountain ditch, third enlargement . . . . .	Clear creek . . . . .	Mar. 15, 1873	113.66	177.30	771.71	74
The Churches ditch, first enlargement . . . . .	Ralston creek . . . . .	May 20, 1873	2.89	8.93	885.37	75
The Ballinger ditch . . . . .	Ralston creek . . . . .	May 31, 1873	1.68	. . . . .	888.26	76
The Colorado Agricultural ditch, first enlargement . . . . .	Clear creek . . . . .	April 5, 1874	31.80	62.00	889.94	77
The Wadsworth & Graves ditch, first enlargement . . . . .	Clear creek . . . . .	May 5, 1874	4.92	6.27	921.74	78
The Agricultural ditch . . . . .	Clear creek . . . . .	Dec. 21, 1874	101.54	. . . . .	926.96	79
The Golden City and Ralston Creek ditch, first enlargement . . . . .	Clear creek . . . . .	Nov. 18, 1877	18.26	59.69	1028.20	80
The Reno & Juchens ditch, first enlargement . . . . .	Clear creek . . . . .	Mar. 2, 1878	18.19	24.50	1046.46	81
The Rocky Mountain ditch, fourth enlargement . . . . .	Clear creek . . . . .	Mar. 16, 1878	12.70	190.00	1064.65	82
The Davis & Brown ditch . . . . .	Lyden creek . . . . .	May 11, 1878	3.00	. . . . .	1077.35	83

The Golden City and Ralston Creek ditch, second enlargement . . . . .	Nov. 15, 1878	18.85	78.54	1086.35	84
The Golden City and Ralston Creek ditch, third enlargement . . . . .	Nov. 20, 1881	32.34	110.88	1099.20	85
The Agricultural ditch, first enlargement . . . . .	Mar. 24, 1883	48.46	150.00	1131.54	86



## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 7.

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION NO. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN	DATE OF AP- PROPRIATION.	Capacity of reser- voir, in cubic feet.	Cubic feet of wa- ter per second appropriated to each priority.	Summation of appropriations to each reser- voir.	Cubic feet of wa- ter previously appropriated.	Order of priority in district.
The Churches reservoir	Ralston creek	May 31, 1868	.....	5.84	.....	.....	1
The Tucker reservoir	Ralston creek	June 1, 1869	.....	5.00	.....	5.84	2
The Churches reservoir, first enlargement	Ralston creek	Mar. 20, 1873	.....	2.89	8.73	10.84	3
The Sloan Lake and Cooper Lake reservoirs	Clear creek.	May 1, 1873	.....	37.00	.....	13.73	4
The Long Lake reservoir	Ralston creek	May 29, 1873	.....	7.54	.....	50.73	5

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 7,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
* David Peabody's ditch . . . . .	. . . . .	Feb. 16, 1888	Feb. 11, 1888	2.60	. . . . . David Peabody
† Page ditch . . . . .	Clear creek . . . . .	June 2, 1888	. . . . .	17.25	The Page Water Co., Wm. A. Hamill, Pres
The Lena ditch . . . . .	Dry creek . . . . .	July 2, 1888	Mar. 15, 1888	2.00	. . . . . Clark Barnes
‡ Brookside ditch . . . . .	Dry creek . . . . .	Aug. 2, 1888	. . . . .	. . . . .	. . . . . H. B. Tuttle
§ Enlargement of Agricultural ditch . . . . .	Clear creek . . . . .	Aug. 10, 1888	Mar. 27, 1888	55.00	{ The Agricultural Ditch Co., J. Gregory, Supt.
Windsoor ditch . . . . .	Dry creek . . . . .	Sept. 7, 1888	Sept. 4, 1888	10.00	. . . . . Mary F. Butterfield

\* There are four reservoirs with capacities as follows: No. 1, 80,000 cu. ft.; No. 2, 100,000 cu. ft.; No. 3, 100,000 cu. ft.; No. 4, 100,000 cu. ft.

† Water claimed to have been appropriated May 15, 1873.

‡ Said to have been originally constructed "about the year 1867," to carry about forty inches of water; to have been enlarged in 1876, to carry seventy-five inches of water; to have been again enlarged in 1877, to carry one hundred inches, or thereabouts; to have been again enlarged, in 1879, to a capacity of one hundred and fifty inches; and on the sixth and seventh days of July, 1878, to have been enlarged to a capacity of 8.24 cu. ft. per second.

§ This enlargement is claimed to increase the total capacity of the Agricultural ditch to 205.05 cu. ft. per second.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 7,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER  
PREVIOUS TO DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Webster reservoir . . . .	Clear creek. {	Farmers High Line & Reser- voir Co's canal	Nov. 9, 1888	Oct. 20, 1887	2,812,500	R. G. Webster
*Webster reservoir, en- largement . . . .	Clear creek. {	Farmers High Line & Reser- voir Co's canal	Nov. 9, 1888	Oct. 31, 1888	4,776,400	R. G. Webster
†David Peabody's reser- voirs. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

\* Total capacity, 7,588,900 cu. ft.

† See remarks with reference to David Peabody's ditch, just above

## STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 7,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER  
PREVIOUS TO DECEMBER 1, 1888.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, in inch- es).	Length of case, (in feet).	DEPTH OF FLOW BE- LOW SURFACE.			LOCATION.	Present flow in gallons per minute.	REMARKS.
				First flow.	Second flow.	Third flow.			
Frank Watson . . . . .	420	3.2	200	135	175	375	Near mouth of Clear creek	150	. . . . .
J. H. Mason . . . . .	494	3	50	140	210	460	Clear Creek Junction . . .	75	. . . . .
Beaver Brooks Water Co . . .	502			170	230	315	Barnum's add. to Denver .	100	. . . . .
Fred Bemis . . . . .	377	3½ 2½	350	177	310	350	Sec. 16, T. 5, R. 68 W . .	35	. . . . .
J. G. Hopkins . . . . .	804	3 2	786				Sec. 8, T. 5, R. 67 W . . .		{ 3 gals. per minute pumped therefrom

LIST OF DITCHES IN WATER DISTRICT NO. 7, RATED BY THE STATE  
ENGINEERING DEPARTMENT DURING 1888.

NAME DITCH OR CANAL.	DATE OF GAUGING.
The Agricultural ditch . . . . .	May 15, 1888
The Golden ditch . . . . .	May 15, 1888
The Rocky Mountain ditch . . . . .	May 16, 1888
The Lee, Stewart & Eskins ditch . . . . .	May 16, 1888
The Churches ditch, on Ralston creek . . . . .	June 13, 1888
The Golden City and Ralston Creek ditch . . . . .	June 15 and 16, 1888
The Reno & Juchens ditch . . . . .	June 22, 1888
The Colorado Agricultural ditch . . . . .	July 20, 1888
The Clear Creek and Platte River ditch . . . . .	July 20, 1888

## WATER DISTRICT No. 8.

*Water District No. 8.—M. B. Downie, Thomas E. Withers and J. W. Cage, Water Commissioners.* Mr. Downie was appointed March 31, 1887, resigned August 15, 1887. Mr. Withers was appointed August 1, 1887, resigned July 3, 1888. Mr. Cage was appointed July 6, 1888; post-office address, Denver, Colorado.

Water district No. 8 consists of all lands irrigated by ditches taking water from Cherry creek, Plum creek and the Platte river, and their tributaries, except Bear creek above district No. 2 and below the forks of the north and south branches of the Platte river.

A plat of this water district, prepared from the reports of the water commissioners thereof, and a graphical presentation of the discharge of the South Platte at the cañon thereof, are found in Part II. of this report.

Mr. Withers reports for the season of 1887 (*inter alia*), that numbers of small ditches are recorded as taking water from Plum creek and its tributaries; that these ditches are short, take their water from springs or small



brooks and cover a very limited area of adjacent land; that a few reservoirs are being constructed in the valleys of Plum creek and its tributaries for the purpose of storing the surplus water occasioned by rains and the spring flows; that the flow of Plum creek is unreliable; that the rains give it a good flow at times, but that the water soon runs off or sinks into the sand of the channel; that he served during the season thirty-seven days; that it is believed the flow of water is increased in lower Plum creek during the latter part of the irrigation season, by reason of the irrigation near its source and on its tributaries, and that in the Plum creek basin there were irrigated during 1887 about 1,180 acres, and that from Little Dry creek and Big Dry creek and springs in that vicinity there were irrigated during that year about 800 acres.

Mr. Cage reports that there were about 190 miles of ditches in his district.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 8.

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION No. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
Platte Water Co.'s ditch . . . . .	South Platte . . . . .	Nov. 28, 1860	30.00	. . . . .	000.00	1
Rough and Ready ditch and mill race . . . . .	South Platte . . . . .	Dec. 31, 1860	37.00	. . . . .	30.00	2
Garber Creek Ditch No. 1 . . . . .	Garber creek . . . . .	June 30, 1861	2.79	. . . . .	67.00	3
Platte Cañon ditch . . . . .	South Platte . . . . .	July 30, 1861	4.70	. . . . .	69.79	4
Nevada Ditch Co.'s ditch . . . . .	South Platte . . . . .	Aug. 30, 1861	28.00	. . . . .	74.49	5
Petersburg Co.'s ditch . . . . .	South Platte . . . . .	Nov. 30, 1861	21.60	. . . . .	102.49	6
Fifty-nine No. 1 ditch . . . . .	Cherry creek . . . . .	May 1, 1862	7.28	. . . . .	124.09	7
Spring Creek ditch . . . . .	Spring creek . . . . .	June 1, 1862	1.83	. . . . .	131.37	8
Brown ditch . . . . .	South Platte . . . . .	Nov. 30, 1862	16.50	. . . . .	133.20	9
Hayland ditch . . . . .	Deer creek . . . . .	Dec. 1, 1862	2.52	. . . . .	149.70	10
Smith-Canal or Ditch Co.'s ditch . . . . .	South Platte . . . . .	Dec. 1, 1863	. . . . .	. . . . .	. . . . .	11
Platte Canon ditch, first enlargement . . . . .	South Platte . . . . .	Dec. 30, 1863	34.00	38.70	152.22	12

# WATER DISTRICT NO. 8.

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59 Ditch No. 2 . . . . .	Plum creek	Dec. 31, 1863	9.00	186.22	13
Platte and Denver Ditch Co.'s ditch . . . . .	South Platte	Oct. 7, 1864	61.71	195.22	14
Chatham ditch . . . . .	Garber creek	Dec. 30, 1864	5.00	256.93	15
Platte Cañon ditch, second enlargement . . . . .	South Platte	Dec. 30, 1864	17.30	56.00	16
Nevada Ditch Co.'s ditch, first enlargement . . . . .	South Platte	Dec. 30, 1865	34.30	62.30	17
Meadow ditch . . . . .	Indian creek	May 31, 1866	5.00	313.53	18
Ditch of John Jones . . . . .	Cherry creek	May 31, 1866	2.61	318.53	19
The Sunny Bank ditch . . . . .	Garber creek	June 1, 1866	1.83	321.14	20
Leinen ditch . . . . .	Cherry creek	June 1, 1866	12.72	322.97	21
Benjamin Quick ditch . . . . .	West Plum creek	June 15, 1866	3.80	335.69	22
Craig ditch . . . . .	West Plum creek	Aug. 30, 1866	2.92	339.49	23
Smith Canal or Ditch Co.'s ditch, first enlargement . . . . .	South Platte	Dec. 30, 1866			24
Kelly ditch . . . . .	Plum creek	Mar. 30, 1867	2.52	342.41	25
The Sixty-seven ditch . . . . .	West Cherry creek	June 15, 1867	6.82	344.93	26
The Pleasant Park ditch . . . . .	Bear creek	Aug. 30, 1867	7.56	351.75	27
Bear creek ditch . . . . .	Bear creek	June 30, 1867	4.39	359.31	28
Ditch of Willis Bryant . . . . .	Plum creek	June 30, 1867	5.00	363.70	29
Kountze ditch . . . . .	{ West fork of West Plum creek }	June 30, 1867	2.52	368.10	30
The Grant ditch . . . . .	{ West fork of West Plum creek }	June 30, 1867	2.52	371.32	31
59 Ditch No. 2, first enlargement . . . . .	Plum creek	July 30, 1867	4.50	373.84	32
The Glen Plumm Ditch No. 1 . . . . .	Deer creek	Dec. 1, 1867	1.95	378.34	33
Rough and Ready ditch and mill-race, first enlargement . . . . .	South Platte	Dec. 31, 1867	31.27	68.27	34

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 8—Continued.

NAME OF DITCH, CANAL OR RESERVOIR	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
Selzell ditch . . . . .	Deer creek . . . . .	Jan. 1, 1868 . . . . .	2.18 . . . . .	. . . . .	411.56 . . . . .	29
The ditch of John Kinner . . . . .	West Plum creek . . . . .	Mar. 1, 1868 . . . . .	3.52 . . . . .	. . . . .	413.74 . . . . .	30
The Last Chance ditch . . . . .	South Platte . . . . .	Mar. 3, 1868 . . . . .	32.00 . . . . .	. . . . .	417.26 . . . . .	31
The First Attempt ditch . . . . .	Cherry creek . . . . .	Mar. 30, 1868 . . . . .	32.00 . . . . .	. . . . .	449.26 . . . . .	32
Plinton & Carey ditch . . . . .	Garber creek . . . . .	July 30, 1868 . . . . .	2.17 . . . . .	. . . . .	481.26 . . . . .	33
Ditch of Ahimaaz Gove . . . . .	West Plum creek . . . . .	June 1, 1869 . . . . .	2.52 . . . . .	. . . . .	483.43 . . . . .	34
Hawkey, Dane & Gird ditch . . . . .	Cherry creek . . . . .	July 30, 1869 . . . . .	2.50 . . . . .	. . . . .	485.95 . . . . .	35
The Boss ditch . . . . .	Cherry creek . . . . .	July 30, 1869 . . . . .	4.72 . . . . .	. . . . .	488.45 . . . . .	
East Plum Creek ditch . . . . .	East Plum creek . . . . .	July 30, 1869 . . . . .	.55 . . . . .	. . . . .	493.17 . . . . .	36
Red Rock and Spring Creek ditch (upper branch) . . . . .	Spring creek . . . . .	May 30, 1870 . . . . .	3.00 . . . . .	. . . . .	493.72 . . . . .	
Red Rock and Spring Creek ditch (lower branch) . . . . .	Spring creek . . . . .	June 1, 1870 . . . . .	3.00 . . . . .	. . . . .	496.72 . . . . .	37
Cook Creek ditch . . . . .	Cook creek . . . . .	June 30, 1870 . . . . .	3.80 . . . . .	. . . . .	499.72 . . . . .	38
The Lower Plum Creek ditch . . . . .	Plum creek . . . . .	Dec. 30, 1870 . . . . .	11.00 . . . . .	. . . . .	503.52 . . . . .	39
The Arnold ditch . . . . .	Carpenter creek . . . . .	Dec. 31, 1870 . . . . .	1.00 . . . . .	. . . . .	514.52 . . . . .	40
Fairview ditch and reservoir . . . . .	Deer creek . . . . .	April 30, 1871 . . . . .	14.00 . . . . .	. . . . .	515.52 . . . . .	41

Ratchiff Spring Creek ditch . . . . .	June 1, 1871	5.41	. . . . .	531.52	42
Plum Creek ditch . . . . .	June 1, 1871	3.00	. . . . .	536.93	
Flinton & Carey ditch, first enlargement . . . . .	June 30, 1871	2.17	4.34	539.93	43
The ditch of C. Alphonse Jarre . . . . .	July 1, 1871	1.50	. . . . .	542.10	44
The High Line ditch . . . . .	Sept. 1, 1871	3.52	. . . . .	543.60	45
Snell ditch . . . . .	Sept. 30, 1871	16.00	. . . . .	547.10	46
Garber Creek Ditch, No. 1 . . . . .	Dec. 1, 1871	1.40	4.19	563.10	47
The Houston ditch . . . . .	Dec. 30, 1871	2.67	. . . . .	564.50	48
Ball ditch . . . . .	April 19, 1872	3.00	. . . . .	567.17	49
Success ditch . . . . .	April 30, 1872	24.00	. . . . .	570.17	50
Ratchiff Plum Creek ditch . . . . .	May 30, 1872	7.50	. . . . .	594.17	51
The McLeod ditch . . . . .	June 1, 1872	3.90	. . . . .	601.67	52
The Indian Creek ditch . . . . .	July 3, 1872	4.00	. . . . .	605.57	53
The Birmingham ditch . . . . .	Dec. 30, 1872	5.00	. . . . .	609.57	54
Happy Cañon Reservoir ditch and reservoirs . . . . .	April 1, 1873	3.00	. . . . .	614.57	55
Ditch of Charles Newmarch . . . . .	April 30, 1873	3.00	. . . . .	617.57	56
Cann Ditch, No. 1 . . . . .	April 30, 1873	2.00	. . . . .		
Purdy ditch . . . . .	May 30, 1873	2.00	. . . . .	620.57	57
Dakar ditch . . . . .	June 1, 1873	1.95	. . . . .	622.57	58
The West ditch . . . . .	June 30, 1873	2.00	. . . . .	624.52	59



## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 8—Continued.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
The French ditch . . . . .	Indian creek . . . . .	June 30, 1873	3.00	. . . . .		
Indian Creek ditch . . . . .	Indian creek . . . . .	June 30, 1873	8.00	. . . . .	626.52	60
The High Line ditch, first enlargement . . . . .	Plum creek . . . . .	June 30, 1873	1.40	4.92		
The Houston ditch, first enlargement . . . . .	Jackson creek . . . . .	June 30, 1873	4.00	6.67		
Haley ditch . . . . .	Cherry creek . . . . .	July 1, 1873	4.00	. . . . .	638.92	61
Garber Creek No. 2 . . . . .	Garber creek . . . . .	Aug. 30, 1873	1.06	. . . . .	642.92	62
Kountze ditch . . . . .	East Plum creek . . . . .	Sept. 1, 1873	.75	. . . . .	643.98	63
Platte Water Company's ditch, first enlargement . . . . .	South Platte . . . . .	Nov. 1, 1873	13.00	43.00	644.73	64
Petersburg Water Company's ditch, second enlargement . . . . .	South Platte . . . . .	Dec. 30, 1873	27.00	54.00	657.73	65
Hawkey, Dane & Gird ditch, first enlargement . . . . .	Cherry creek . . . . .	Dec. 30, 1873	2.00	4.50		
Stewart ditch . . . . .	West Plum creek . . . . .	April 1, 1874	5.00	. . . . .	686.73	66
Woodhouse ditch . . . . .	Indian creek . . . . .	April 1, 1874	2.30	. . . . .	694.03	67
Sobey ditch . . . . .	Indian creek . . . . .	April 30, 1874	1.48	. . . . .	696.51	68
Harrison ditch . . . . .	Cherry creek . . . . .	May 30, 1874	4.36	. . . . .		

The Barrows ditch	Indian creek	June 30, 1874	2.48	...	700.87	69
Ditch of George Dane	Cherry creek	June 30, 1874	1.80	...	...	
59 ditch No. 1, first enlargement	Cherry creek	Dec. 30, 1874	...	7.28	...	
Smith Canal or Ditch Co.'s ditch, second enlargement	South Platte	Dec. 30, 1874	...	56.00	705.15	70
Goodrich ditch	Cherry creek	Dec. 30, 1874	5.00	...	...	
The West Cherry Creek ditch	Cherry creek	Feb. 28, 1875	6.87	...	710.15	71
The Murrin ditch	Cherry creek	Mar. 30, 1875	3.25	...	717.02	72
The Perry ditch	Plum creek	June 30, 1875	1.47	...	...	
The Cleona ditch	Cherry creek	June 30, 1875	2.00	...	720.27	73
The Crawford ditch	Cherry creek	June 30, 1875	5.00	...	...	
Cann Ditch No. 2	Indian creek	Oct. 30, 1875	1.83	...	728.74	74
The Pioneer ditch	Cherry creek	Mar. 9, 1876	5.83	...	730.57	75
The Smith ditch	East Cherry creek	Mar. 10, 1876	4.52	...	736.30	76
John B. Hixon's ditch	Cherry creek	Spring, 1876	...	...	...	77
The McCracken ditch	East Cherry creek	June 30, 1877	3.00	...	740.82	78
Upton T. Smith's ditch	Spring creek	June 30, 1877	1.00	...	...	
The Deer Creek Cañon ditch and Mann reservoir	Deer creek	Dec. 8, 1877	3.33	...	744.82	79
The ditch of J. F. Gardner	Cherry creek	Dec. 18, 1877	5.92	...	748.15	80
The Monroe ditch	Cherry creek	May 30, 1878	3.25	...	754.07	81
The High Line ditch, second enlargement	Plum creek	June 30, 1878	15.08	20.00	757.32	82
The Thirty-three (33) ditch	Plum creek	June 30, 1878	3.44	...	...	
The Smith Canal or Ditch Co.'s ditch, third enlargement	South Platte	July 30, 1878	7.57	...	775.84	83

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 8—Continued.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF AP- PROPRIATION.	Cubic feet of wa- ter per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per sec- ond previously appropriated in district.	Order of priority in district.
The Montgomery ditch . . . . .	Cherry creek . . . . .	Sept. 1, 1878	3.50	. . .	783.41	84
Denver City Irrigation and Water Company's canal, reservoir and water works.	South Platte . . . . .	Sept. 10, 1878	278.26	. . .	786.91	85
The Cleona ditch, first enlargement . . . . .	Cherry creek . . . . .	Oct. 30, 1878	1.50	3.50	1065.17	86
The Murnur ditch, first enlargement . . . . .	Cherry creek . . . . .	Dec. 30, 1878	1.75	5.00	1068.67	87
The Northern Colorado Irrigation Company's ditch . . . . .	South Platte . . . . .	Jan. 18, 1879	1184.00	. . .	1073.67	88
Happy Cañon reservoir, ditch and reservoirs, first enlargement . . . . .	Happy Cañon creek . . . . .	Mar. 10, 1879	.80	. . .	2257.67	89
The Pioneer ditch, first enlargement . . . . .	Cherry creek . . . . .	June 30, 1879	1.17	7.00	2258.47	90
The Shore ditch . . . . .	Cherry creek . . . . .	June 30, 1879	5.00	. . .		
East Side ditch . . . . .	Carpenter creek . . . . .	Aug. 30, 1879	2.00	. . .	2264.64	91
Ditch of George Dane, first enlargement . . . . .	Cherry creek . . . . .	Oct. 30, 1879	.49	2.29	2266.64	92
The Snyder ditch . . . . .	West Fork of Plum creek . . . . .	Nov. 1, 1879	3.00	. . .	2267.13	93
Hawkey, Dane and Gird ditch, second enlargement . . . . .	Cherry creek . . . . .	Dec. 30, 1879	15.15	19.65	2270.13	94
The Stevens ditch . . . . .	Plum creek . . . . .	Dec. 30, 1879	7.56	. . .		
The Gillman ditch . . . . .	Cherry creek . . . . .	Feb. 28, 1880	9.50	. . .	2292.84	95
The Huntsville ditch . . . . .	West Plum creek . . . . .	Mar. 1, 1880	9.12	. . .	2302.74	96

The Reservoir ditch	East Plum creek	Mar. 3, 1880	8.24	2311.86	97
Castle Rock ditch and reservoir	Plum creek	April 1, 1880	2.00	2320.10	98
The Enterprise Ditch No. 1	Plum creek	April 15, 1880	10.12	2322.10	99
The Little Daisy ditch	Garber creek	May 10, 1880	.99	2332.22	100
The Monroe ditch, first enlargement	Cherry creek	May 30, 1880	1.25	2333.21	101
The Enterprise Ditch No. 2	Cherry creek	May 14, 1881	4.50	2324.46	102
The Excelsior ditch	Cherry creek	May 25, 1881	4.50	2328.96	103
The Purdy ditch, first enlargement	Garber creek	May 30, 1881	2.00	4.00	104
The Glen Plumm Ditch No. 2	Deer creek	May 30, 1881	12.00	2333.46	104
The Hillside ditch	Cook creek	July 1, 1881	3.65	2347.46	105
Phelan ditch	East Plum creek	Aug 1, 1881	2.73	2351.11	106
The ditch of J. Byron Tucker	Cherry creek	Nov. 1, 1881	4.36	2353.84	107
The Alderman ditch	East Cherry creek	Nov. 1, 1881	5.00	2353.84	107
The Hill ditch	Garber creek	Jan. 1, 1882	2.00	2353.22	108
The Lake Gulch ditch	Lake Gulch	Feb. 28, 1882	2.00	2365.22	109
Platte Water Company's ditch, second enlargement	South Platte	Mar. 7, 1882	42.95	85.95	110
The Antelope ditch	Antelope creek	Mar. 31, 1882	3.85	2410.17	111
Spring Creek ditch, first enlargement	Spring creek	May 15, 1882	2.59	4.42	112
The Necessity ditch	West Cherry creek	June 26, 1882	6.67	2416.61	113
*Petersburg Company's ditch, first enlargement	South Platte	Dec. 30, 1883	5.40	2423.28	114

\*It is thought that the first enlargement of the Petersburg Company's ditch should have been dated December 30, 1873, and that the date of December 30, 1883, is a clerical error in the certified copy of decree. The order of priority in this table corresponds to the dates of appropriations. The record of the quantities of water appropriated previous to the allotments to the several priorities will vary somewhat according to the interpretations given the decree, and is only approximately correct.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 8,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
* Baucroft ditches.		Feb. 11, 1888			F. J. Baucroft
† Jacob ditch	Cherry creek	Mar. 10, 1888	Dec. 20, 1887		William Jacob, William B. Berger
‡ John Thomas ditch	Cottonw'd crk	Apr. 18, 1888	Oct. 6, 1886	2.00	John Thomas
§ Linhart ditch	Marcy gulches	May 2, 1888	Dec. 1, 1887	3.00	Eliza Linhart, Peter F. Legere
The Lambert ditch or feeder	Indian creek	May 21, 1888	Feb. 9, 1888	10.00	William T. Lambert
The Lewis & Hawkey ditch.	Cherry creek	Aug. 13, 1888	Aug. 25, 1884	2.50	J. R. Lewis, Robert Hawkey
Gwilliam ditch	Cherry creek	June 30, 1888	June 25, 1888	13.00	Richard J. Gwilliam
The Griffith ditch	Indian creek	Sept. 14, 1888	June 12, 1888	72.00	The Griffith Ditch Company
¶ Feeder to reservoir enlargement	Deer creek	Oct. 31, 1888	Oct. 8, 1888	32.66	Frank I. Mann
Melvin ditch	Cherry creek	Nov. 9, 1888	May 17, 1887	12.00	William W. Porter et al.

\* Two reservoirs to be connected with these ditches.

† The carrying capacity is claimed to be 345 inches of water.

‡ The John Thomas reservoir is said to be supplied by this ditch, and to have a capacity of about 290,000 cubic feet.

§ This ditch is slated to run into the Linhart reservoir. The construction of the reservoir is said to have begun December, 1887, and the capacity thereof is given as 1,000,000 cubic feet.

|| This ditch is claimed to be an enlargement of the French ditch. The capacity of the reservoir to be filled by that feeder is claimed to be 36,000,000 cubic feet.

¶ Capacity before enlargement, 13.33 cubic feet per second; capacity after enlargement, 45.99 cubic feet per second.



## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 8,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
*Reservoir, enlargement Melvin reservoir . . . . .	Deer creek. Cherry creek.	Feeder. Melvin ditch.	Oct. 31, 1888 Nov. 9, 1888	Oct. 8, 1888 May 17, 1887	1,665,000 1,000,000	Frank I. Mann William W. Porter et al.

\*Original capacity, 365,000 cubic feet.  
Relative to John Thomas' reservoir, the Linhart reservoir and Lambert's reservoir, see remarks preceding this table.

## STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 8,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inch- es)	Length of case, (in feet).	DEPTH OF FLOW BE- LOW SURFACE.			LOCATION.	Present flow in gallons per minute.	REMARKS.
				First flow.	Second flow.	Third flow.			
John Evans . . . . .	375.7	5 $\frac{5}{8}$	320	200	350	...	Fifteenth and Larimer sts.	...	...
South Capitol Hill Well No. 1	671	6 $\frac{5}{8}$ 4 $\frac{1}{2}$	671	605	...	...	...	...	...
Denver Tramway Co. . . . .	647.5	$\left\{ \begin{array}{l} 6\frac{5}{8} \\ 4\frac{3}{4} \\ 3\frac{1}{2} \end{array} \right\}$	595	290	400	600	Fifteenth and Broadway . . .	...	...
J. Cook, Jr. . . . .	1069.5	5 $\frac{5}{8}$ 2 $\frac{1}{2}$	723	640	723	...	North Capitol Hill . . . . .	...	...
State of Colorado . . . . .	802.6	3 $\frac{1}{2}$	740	502	600	747	N. E. cor. City Park sc. sec.	...	...
D. H. Hunter . . . . .	500	3 $\frac{1}{2}$ 2 $\frac{1}{2}$	500	$\left\{ \begin{array}{l} 247 \\ 390 \end{array} \right\}$	$\left\{ \begin{array}{l} 260 \\ 445 \end{array} \right\}$	$\left\{ \begin{array}{l} 304 \\ 470 \end{array} \right\}$	Sec. 19, T. 5, S. R. 68 W . . .	...	...
J. O. Lawton . . . . .	565	3 $\frac{1}{2}$ 2 $\frac{1}{2}$	548	240	400	548	Six miles s. on Broadway . .	20	...
Light & Pray . . . . .	300	2 $\frac{1}{2}$	185	185	243	293	Sec. 17, T. 5, S. R. 68 W . . .	5	...

LIST OF DITCHES IN WATER DISTRICT No. 8, RATED BY THE  
STATE ENGINEERING DEPARTMENT DURING 1888.

NAME OF DITCH OR CANAL.	DATE OF GAUGING.
The Platte Water Co.'s . . . . .	July 24 and July 31, 1888

## WATER DISTRICT No. 9.

*Water District No. 9, J. A. Van Gordon, Water Commissioner.* Appointed July 8, 1887. Residence, Morrison, Colorado.

Water District No. 9 consists of all lands irrigated by ditches taking water from Bear creek and its tributaries. A plat of this water district, prepared from the report of the water commissioner thereof, and a graphical presentation of the discharge of Bear creek, are given in Part II. of this report.

Mr. Van Gordon reports for the year 1888 (*inter alia*), that he commenced the distribution of water March 14, and that he served eighty days, ending August 17; that he had no trouble whatever in the distribution of water in his district; that some of the older ditches had decreed to them nearly double the water they could carry, and more than they needed for the irrigation of their crops; that he endeavored to distribute to these ditches no more water than they actually needed to nourish the crops thereunder; that it is his opinion that the water should be decreed to the land rather than to the ditches, and that the following particulars concerning the ditches and the use made of water in his district are approximately correct:

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 9,  
BY THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
McBroom . . . . .	1	200	20		20	50
Simonton . . . . .	3½	450	100			100
Hodgson . . . . .	2	150			25	40
Warrior . . . . .	3½	600	3			10
Olsen & Bell . . . . .	1½	200	20			30
Hindey . . . . .	1	120	60		3	
Pioneer Union . . . . .	4	450	125			85
Sprickerman . . . . .	1¼	50	15		10	
Lewis & Strouse . . . . .	1	100	18			15
Sprickerman, Lower . . . . .	1	40	10			8
Robert Lewis . . . . .	3	280	50		30	
Arnott . . . . .	8	2,320	1,500			800
Sprickerman, Middle . . . . .	1	30	10			10
Churn . . . . .	¼	10	10			
Fisher . . . . .	¾	40				
Bergen . . . . .	2¼	1,000	100			100
Independent High Line . . . . .	4	175	15			150
Ward & Kendrick . . . . .	11	600	200			

So that there were irrigated from the waters of Bear creek and its tributaries, distributed through fifty miles of ditches, 2,256 acres of alfalfa, no seeded grasses, 88 acres of natural grasses, and 1,398 acres of crops other than grasses, making a total area irrigated of 3,742 acres; and if there were sufficient water to supply the ditches already constructed, there could be irrigated in this district about 6,915 acres of land.

## STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT NO. 9,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER  
PREVIOUS TO DECEMBER 1, 1888.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inch- es).	Length of case, (in feet).	DEPTH OF FLOW BE- LOW SURFACE.			LOCATION.	Present flow in gallons per minute.	REMARKS.
				First flow.	Second flow.	Third flow.			
United States . . .	685	6 $\frac{5}{8}$ 5 $\frac{5}{8}$	660	292	450	660	Military Post	10	



**STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 9,  
RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.**

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water therefo.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet	NAME OF CLAIMANT.
* Ward Reservoir No. 1 . . .	Clear creek & Bear creek .	Ward ditch & Agr'l ditch .	Sept. 19, 1888	—	42,364,000	Wm. S. Ward
Ward Reservoir No. 2 . . .	Clear creek & Bear creek .	Ward ditch & Agr'l ditch .	Sept. 19, 1888	Oct. —, 1887	2,272,800	Wm. S. Ward
† Ward Reservoir No. 3 . . .	Clear creek & Bear creek .	Ward ditch & Agr'l ditch .	Sept. 19, 1888	—	230,000	Wm. S. Ward
Ward Reservoir No. 4 . . .	Clear creek & Bear creek .	Ward ditch & Agr'l ditch .	Sept. 19, 1888	Oct. —, 1887	320,000	Wm. S. Ward
H. W. Lake Reservoir A . . .	Bear creek & Turkey creek	Arnett ditch .	Nov. 27, 1888	Mar. 4, 1885	13,939,200	Henry W. Lake
H. W. Lake Reservoir B . . .	Bear creek & Turkey creek	Arnett ditch .	Nov. 27, 1888	Nov. 1, 1887	3,920,400	Henry W. Lake
H. W. Lake Reservoir C . . .	Bear creek & Burkey creek	Arnett ditch .	Nov. 27, 1888	Oct. 1, 1886	653,400	Henry W. Lake
H. W. Lake Reservoir D . . .	Bear creek & Turkey creek	Waste and seepage . . .	Nov. 27, 1888	Nov. 1, 1887	1,306,800	Henry W. Lake
. . . . .	Roaring Fork river . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

\* Originally constructed in 1882; work on enlargement commenced August 29, 1888; increase of capacity occasioned by enlargement, 22,672,000 cu. ft.; original capacity, 19,692,000 cu. ft.; total, 42,364,000 cu. ft.

† Work on original construction began in September, 1886; capacity as originally constructed, 164,000 cu. ft.; enlargement commenced August 29, 1888, and the increased capacity occasioned thereby —66,000 cu. ft.

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 9,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION No. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.			Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second previously appropriated in district.	Order of priority in district.
			Cubic feet of water decreed to each priority.	per second	of each priority.			
The McBroom ditch . . . . .	Bear creek . . . . .	Nov. 1, 1859	11.58				000.00	1
The Simonton ditch . . . . .	Bear creek . . . . .	Dec. 25, 1860	35.76				11.58	2
The Hodgson ditch . . . . .	Bear creek . . . . .	June 1, 1861	8.25				47.34	3
The Warrior ditch . . . . .	Bear creek . . . . .	Dec. 1, 1861	12.33				55.59	4
The Pioneer Union ditch . . . . .	Bear creek . . . . .	Dec. 10, 1861	12.41				67.92	5
The Olson & Bell ditch . . . . .	Bear creek . . . . .	Mar. 15, 1862	6.30				80.33	6
The Hindry ditch . . . . .	Bear creek . . . . .	April 15, 1862	9.15				86.63	7
The Warrior ditch . . . . .	Turkey creek . . . . .	April 16, 1862	2.86				95.78	8
The Hodgson ditch, first enlargement . . . . .	Bear creek . . . . .	May 31, 1862	2.07			10.32	98.64	9
The Lawn ditch . . . . .	Bear creek . . . . .	June 10, 1862	1.47				100.71	10
The Pioneer Union ditch . . . . .	Bear creek . . . . .	Sept. 1, 1862	18.13			30.54	102.18	11
The Spickerman ditch . . . . .	Turkey creek . . . . .	Nov. 1, 1862	10.61				120.31	12

The Lewis & Strouse ditch	Bear creek	Mar. 1, 1863	30.86	130.92	13
The Warrior ditch	Bear creek	Oct. 31, 1864	25.47	161.78	14
The Pioneer Union ditch, first enlargement	Bear creek	Mar. 15, 1865	25.13	187.25	15
The Warrior ditch	Bear creek	April 1, 1865	11.49	212.38	16
The Strouse ditch	Bear creek	May 1, 1865	4.80	223.87	17
The Spickerman Lower ditch	Turkey creek	June 1, 1865	9.32	228.67	18
The Robert Lewis ditch	Bear creek	Oct. 1, 1865	17.00	237.99	19
The Hindry ditch, first enlargement	Bear creek	Dec. 31, 1867	8.94	254.99	20
The Arnett ditch	Turkey creek	April 15, 1868	10.75	263.93	21
The Spickerman Middle ditch	Turkey creek	June 1, 1868	6.46	274.68	22
The Arnett ditch	Bear creek	Mar. 16, 1869	7.94	281.14	23
The Churn ditch	Bear creek	April 15, 1870	1.49	289.08	24
The Arnett ditch, first enlargement	Bear creek	May 1, 1871	25.54	299.57	25
The Fischer ditch	Bear creek	Sept. 16, 1871	2.88	316.11	26
The Bergen ditch	Turkey creek	May 1, 1874	12.00	318.99	27
The Independent High Line ditch	Turkey creek	Sept. 6, 1878	26.68	330.99	28
The Independent High Line ditch, first enlargement	Turkey creek	Sept. 25, 1881	4.01	357.67	29
The Arnett ditch, second enlargement	Bear creek	Mar. 1, 1882	12.87	361.68	30
The Ward ditch	Bear creek	Dec. 6, 1882	63.00	374.55	31

# STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 9,

PREPARED BY THE SUPERINTENDENT OF IRRIGATION OF WATER DIVISION NO. 1, FROM THE CERTIFIED COPY OF THE DECREE GOVERNING APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED HIM BY THE CLERK OF THE DISTRICT COURT.

WATER DISTRICT NO. 9.						
NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second previously appropriated in district.	Order of priority in district.
The Harriman reservoir . . . . .	{ One-fifth Turkey creek { Four-fifths Bear creek, {	May 1, 1873	18.09	. . . . .	000.00	1
The Bergen reservoirs, first enlargement . . . . .	Turkey creek. . . . .	May 1, 1874	12.00	. . . . .	18.09	2
The Harriman reservoir. . . . .	{ One-fifth Turkey creek { Four-fifths Bear creek, {	April 1, 1875	37.58	55.67	30.09	3
The Bowles reservoirs . . . . .	Bear creek . . . . .	May 10, 1876	11.06	. . . . .	67.67	4
The Deane reservoir . . . . .	Turkey creek. . . . .	Sept. 6, 1878	26.68	. . . . .	78.73	5
The Bowles reservoirs, first enlargement. . . . .	Bear creek . . . . .	May 15, 1880	15.75	26.81	105.41	9
The Johnston reservoir . . . . .	Bear creek . . . . .	May 15, 1880	26.81	. . . . .	121.16	7
The Deane reservoir, first enlargement . . . . .	Turkey creek . . . . .	Sept. 25, 1881	4.01	30.69	147.97	8
The Hard & Keudrick reservoirs. . . . .	Bear creek . . . . .	Dec. 6, 1882	63.00	. . . . .	151.08	6

## WATER DISTRICT No. 23.

*Water District No. 23—William H. Powless, Water Commissioner.* Appointed December 4, 1888. Post-office address, Alma, Colorado.

Water District No. 23 consists of all lands in the State of Colorado being, or to be irrigated from ditches or canals taking water from the South Platte river, or from any of its direct or indirect tributaries, at any point or points above Water District No. 8, in said State. This water district was created by the Governor August 30, 1888, upon petition from numerous residents and users of water for irrigation in South Park. The creation of this water district was desirable for the following reasons: First, that the superintendent of irrigation should be able to control the use of the waters in South Park, which he is not able to do unless that portion of the country is embraced in a water district; second, that the residents of the Park may secure an adjudication of their water rights, which can only be done when they are embraced in a water district.



## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 23,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT
Douglas ditch . . . . .	Dry creek . . . . .	Nov. 5, 1888	Oct. 30, 1888	6.00	. . . . . John Douglas



## CHAPTER III.

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*Water Division No. 2, Arkansas Division, Mr. Eli H. Stone, Superintendent of Irrigation. Appointed May 12, 1887. Residence, Pueblo, Colorado.*

Water Division No. 2 includes all water districts consisting of lands watered from the Arkansas river and its tributaries, and is named the Arkansas Division.

This water division embraces water districts numbered 10 to 19 inclusive. (See drainage map of Colorado, in Part II. hereof.)

Mr. Stone reports that he was greatly inconvenienced by the tardy response to his requests for certified copies of the decrees on the part of the clerks of the District courts.

*Water District No. 10, Thomas Shideler, Water Commissioner.* Water District No. 10 consists of all lands irrigated from ditches or canals taking water from the Fountain and its tributaries, provided that said district shall not extend beyond the limits of El Paso county. A plat of this district, prepared from the report of the water commissioner thereof, is found in Part II. of this report.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 10,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
*Myers ditch, enlargement and extension thereof	{ North & South } Cheyenne cr'k }	July 26, 1887	April 28, 1887	98.14	{ The Broadmoor Dairy and Live Stock } Co., James M. Pourtales, President.
†The Charter Oak ditch	Lit. Fontaine cr	Oct. 21, 1887	Aug. 15, 1887	60.40	C. W. Haynes
‡Bear Lake ditch.	Bear creek	Dec. 2, 1887	Aug. 16, 1887	5.22	Timothy E. Johnson
§Grindstone ditch	Cheyenne creek.	Dec. 2, 1887		4.52	Timothy E. Johnson
Flanagan ditch	{ Fontaine Que } Bouille }	Dec. 21, 1887	Oct. 14, 1887	6.39	Frank Flanagan
Broadmoor Spring Run ditch	Spring Run	Jan. 2, 1888		13.00	{ The Broadmoor Dairy and Live Stock } Co., James M. Pourtales, President.
*The Broadmoor Spring ditch	Spring Run	Jan. 5, 1888		8.00	{ The Broadmoor Dairy and Live Stock } Co., James M. Pourtales, President.
Broadmoor North Spring ditch	North Spring crk	Jan. 5, 1888	Oct. 8, 1887	16.50	{ The Broadmoor Dairy and Live Stock } Co., James M. Pourtales, President.
Broadmoor South Spring ditch	South Spring crk	Jan. 5, 1888	Oct. 8, 1887	16.50	{ The Broadmoor Dairy and Live Stock } Co., James M. Pourtales, President.
J. S. King ditch, first extension	Lit. Fontaine cr	Jan. 19, 1888	Nov. 3, 1887	12.66	John S. King
J. S. King Ditch No. 2	Lit. Fontaine cr	Jan. 19, 1888	Nov. 12, 1887	12.66	John S. King
**Roberts ditch	Bierstadt creek.	Jan. 30, 1888	Nov. 4, 1887	25.32	William T. Roberts
Midland ditch	Fontaine creek	Mar. 24, 1888	Nov. 12, 1887	12.80	Lucretia L. Hall
Thompson High Line ditch	So. Monument cr	Mar. 27, 1888	Aug. 17, 1886	5.75	W. Finley Thompson

Clematis ditch	Cheyenne creek	April 6, 1888	Mar. 2, 1888	5.80	Bettie M. Cormon
† Clover Irrigating ditch	{ Fontaine Qui Bouille }	April 13, 1888			
South Cheyenne Irrigating ditch		April 13, 1888		33.60	
Valley ditch	Shook's run	April 20, 1888	Feb. 13, 1888	4.60	George De La Vergne
McNew ditch	Douglas creek	May 17, 1888	Feb. 25, 1888	14.14	Ella S. McNew
††Corbin ditch	{ Fontaine Qui Bouille }	May 26, 1888	Oct. —, 1881	3.00	Marcus B. Corbin
The Nevins ditch	Spring creek	June 4, 1888	Mar. 29, 1888	3.50	George O. Nevins
The Jones ditch	Cheyenne creek	June 8, 1888	April 25, 1888	8.00	William B. Jones
‡ Justus ditch		June 18, 1888	May 6, 1888	4.00	Ella M. Barnes
‡‡Phelps ditch	{ N. fork of W. Monument crk }	Aug. 2, 1888	July 21, 1888	1.6	S. Phelps
The Holden ditch, extension thereof	Monument creek	Aug. 9, 1888	April 30, 1888	2.17	The Boston Land Co., A. L. Lawton, Pres
Fuller ditch	{ East branch }	Aug. 30, 1888	Aug. 6, 1888	13.9	John H. Fuller
Younger Spring ditch	{ Beaver creek }	Nov. 22, 1888		4.00	John H. Bruening
¶ Fursman ditch	Spring				Margaret H. Fursman
	Bierstadt creek	Nov. 22, 1888	Sept. 14, 1888	11.00	

\* The original capacity of the Myers ditch, 3.86 cubic feet per second; enlargement, 98.14 cubic feet per second, making 102.00. Work upon the Broadmoor reservoir, connected therewith, was commenced April 28, 1887; capacity of said reservoir is 8,933,333 cubic feet.

† The Haynes storage reservoir, to be supplied thereby in part, has a capacity of 8,702,600 cubic feet. Work was commenced on this reservoir on August 15; also a lateral from the Merriam Rock Creek ditch.

†† The reservoir to be known as Bear Lake is to be supplied therefrom.

‡ Survey began August 16, 1887.

‡‡ Survey commenced April 30, 1887.

¶ Survey was commenced April 30, 1887.

\*\* The reservoir designated Roberts' reservoir is supplied by this ditch.

†† It would seem that the South Cheyenne irrigating ditch was a continuation of the Clover irrigating ditch. It is not clear to whom these ditches belong. They supply the Cheyenne Mountain reservoir.

‡‡ This supplies the Corbin reservoir, having a capacity of 800,000 gallons, more or less.

‡‡ Draws water from a reservoir, name not given.

‡‡ Supplies reservoir designated as Phelps' reservoir.

¶¶ This ditch is connected with the Fursman reservoir, the capacity of which is claimed to be 1,400,000 gallons.



## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 10,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
Broadmoor reservoir . . .	North & South Cheyenne cr'k	The Meyers ditch . . .	July 26, 1887	April 28, 1887	8,933,333	{ The Broadmoor Dairy and Live Stock Co., John Pourtales, Pres.
Haynes Storage reservoir . . .	Little Foun- tain creek . . .	The Charter Oak ditch & laterals from Merriam R'k crk and ditch	Oct. 21, 1887	Aug. 15, 1887	8,702,600	C. W. Haynes
Bear Lake reservoir . . .	Bear creek . .	Bear Lake ditch . . .	Dec. 2, 1887		1,205,280	Timothy E. Johnson
Cascade Storage Reservoir No. 1 . . . . .	West Moun- tain creek . .	Dam . . .	Dec. 21, 1887	Sept. 22, 1887	600,000	{ The Cascade Ice Co., George G. Galla- gher, Vice-Pres.
Cascade Storage Reservoir No. 2 . . . . .	West Moun- tain creek . .	Iron Pipe Line from Cascade Res. No. 1 . .	Dec. 21, 1887	Sept. 22, 1887	1,200,000	{ The Cascade Ice Co., George G. Galla- gher, Pres.
Roberts reservoir . . . . .	Bierdsadt cr'k	Roberts ditch	Jan. 30, 1887	Nov. 4, 1887	230,000	William T. Roberts
The Cheyenne Mountain reservoir . . . . .	Fountainne Qui Bouille . . .	Clover irriga- ting ditch and South Chey- enne irrigat- ing ditch . . .	April 13, 1888	Mar. 1, 1887	21,500,000	{ John Curr A. E. Touzalin
Wolfe reservoir . . . . .		Elvora ditch .	May 2, 1888	Mar. 1, 1888	160,635	John Wolfe

Corbin reservoir.		Corbin ditch .	May 26, 1888				Marcus B. Corbin
Phelps reservoir.		Phelps ditch .	Aug. 26, 1888	July 21, 1888	26,000		S. Phelps
3 Broadmoor reservoir No. 1	Broadmoor Spring run.	Broadmoor Spring ditch	Sept. 7, 1888	Aug. 21, 1888	1,880,000	{	The Broadmoor Dairy and Live Stock Co., James N. Pourtales, Pres.
Broadmoor reservoir No. 2	Broadmoor Spring run.	Broadmoor Spring ditch and Res. No. 1	Sept. 7, 1888	Aug. 21, 1888	2,000,000	{	The Broadmoor Dairy and Live Stock Co., James N. Pourtales, Pres.
Broadmoor reservoir No. 3	Broadmoor South Spr'g creek		Sept. 7, 1888	Aug. 21, 1888	200,000	{	The Broadmoor Dairy and Live Stock Co., James N. Pourtales, Pres.
Broadmoor reservoir No. 4	Broadmoor South Spr'g creek		Sept. 7, 1888	Aug. 21, 1888	475,000	{	The Broadmoor Dairy and Live Stock Co., James N. Pourtales, Pres.
Mt. Baldy reservoirs	Springs at source of N. Cheyenne creek	N. Cheyenne creek app. as ditch of exit.	Aug. 22, 1888	June 8, 1888	21,500,000	{	J. N. Pourtales, William J. Wilcox
*Fursman reservoir.	Bierstadt cr'k		Nov. 22, 1888	Sept. 14, 1888			Margaret H. Fursman

\* Capacity claimed, 1,400,000 gallons. Connected with Fursman ditch.

The superintendent of irrigation of Water Division No. 2 was not furnished with a certified copy of the decree covering the dates and amounts of appropriations of water in Water District No. 10, until late in the season of 1888, and has not furnished this office with a tabulated statement relative to the ditches embraced in the decree. It is thought advisable, rather than that this report should not show, so far as possible the particulars concerning water rights in Water District No. 10, to present the following table:

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 10,

GIVING THE DATE AND ORDER OF PRIORITY AND AMOUNT OF EACH APPROPRIATION, TOGETHER WITH THE TOTAL AMOUNT OF EACH PRECEDING APPROPRIATION OF DITCHES AND CANALS, IN DISTRICT No. 10, AS THEY HAVE BEEN ESTABLISHED BY THE DECREE OF COURT OF THE FOURTH JUDICIAL DISTRICT. (TAKEN FROM THE REPORT OF THE STATE ENGINEER, FOR 1883 AND 1884.)

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
The Flanagan ditch. . . . .	Fountain creek . . . . .	April —, 1860	0.74	0.74	0.00	1
The Harnes ditch. . . . .	Fountain creek . . . . .	Fall, 1861	3.50	3.50	0.74	2
The Harnes ditch, first enlargement . . . . .	Fountain creek . . . . .	Fall, 1872	10.12	13.62	373.31	33
The Bly ditch . . . . .	Fountain creek . . . . .	Winter, 1861	22.40	22.40	4.24	3
Treadwell and Lamb ditch . . . . .	Fountain creek . . . . .	Fall, 1861	9.84	9.84	26.64	4
The Lincoln ditch. . . . .	Fountain creek . . . . .	Fall, 1861	8.86	8.86	36.48	5
The Lincoln ditch, first enlargement . . . . .	Fountain creek . . . . .	Fall, 1863	7.34	16.20	216.68	23
The Stubbs and Miller ditch . . . . .	Fountain creek . . . . .	—, 1861	15.30	15.30	45.34	6
The Banning ditch . . . . .	Fountain creek . . . . .	Apr. 20-30, '62	11.20	11.20	60.64	7
The Owen and Hall ditch. . . . .	Fountain creek . . . . .	—, 1862	17.40	17.40	71.84	8
The Burke ditch . . . . .	Fountain creek . . . . .	—, 1862	7.72	7.72	89.24	9

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 10—Continued.

NAME OF DITCH, CANAL, OR RESERVOIR	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second previously appropriated in district.	Order of priority in district.
The Laughlin ditch . . . . .	Fountain creek . . . . .	—, 1862	9.36	9.36	96.96	10
The Laughlin ditch, first enlargement . . . . .	Fountain creek . . . . .	—, 1863	6.42	15.78	171.90	17
The Fountain ditch . . . . .	Fountain creek . . . . .	Feb. —, 1863	23.70	23.70	106.32	11
The Fountain ditch, first enlargement . . . . .	Fountain creek . . . . .	—, 1864	7.68	31.38	200.64	21
The Sheldon ditch . . . . .	Fountain creek . . . . .	Winter, 1863	8.37	8.37	130.02	12
The Robinson ditch . . . . .	Fountain creek . . . . .	Mar. —, 1863	10.35	10.35	138.39	13
The Liston and Love ditch . . . . .	Fountain creek . . . . .	Spring, 1863	8.82	8.82	148.74	14
The Liston and Love ditch, first enlargement . . . . .	Fountain creek . . . . .	—, 1871	3.60	12.42	369.71	33
The Lock ditch . . . . .	Fountain creek . . . . .	—, 1862	6.30	6.30	157.56	15
The Miller ditch . . . . .	Fountain creek . . . . .	—, 1863	8.04	8.04	163.86	16
The Tom Wanless ditch . . . . .	Fountain creek . . . . .	Mar. —, 1864	7.50	7.50	178.32	18
Anthony Bott and Chambers' ditch . . . . .	Fountain creek . . . . .	Spring, 1864	8.82	8.82	185.82	19
Anthony Bott and Chambers' ditch, first enlargement . . . . .	Fountain creek . . . . .	April —, 1881	3.54	12.36	511.84	46
The Talcott and Colton ditch . . . . .	Fountain creek . . . . .	—, 1864	6.00	6.00	194.64	20
The Lock ditch No. 2 . . . . .	Fountain creek . . . . .	—, 1864	8.36	8.36	208.32	22



The Locke Ditch No. 2, first enlargement . . . . .	Fountain creek . . . . .	— — —, 1880	5.02	13.38	506.82	45
The Everhart ditch . . . . .	Fountain creek . . . . .	— — —, 1865	3.22	3.22	224.02	24
The Everhart ditch, first enlargement . . . . .	Fountain creek . . . . .	— — —, 1875	3.78	7.00	477.38	42
The Doctor Rogers' ditch . . . . .	Fountain creek . . . . .	Mar. —, 1866	5.55	5.55	227.24	25
The Irvine ditch . . . . .	Fountain creek . . . . .	April —, 1866	7.72	7.72	232.39	26
The Chilcott ditch . . . . .	Fountain creek . . . . .	Spring, 1866	27.00	27.00	240.51	27
The Chilcott ditch, first enlargement . . . . .	Fountain creek . . . . .	Spring, 1874	20.36	47.36	424.71	39
The Terrill ditch . . . . .	Fountain creek . . . . .	— — —, 1866	8.48	8.48	267.51	28
The Widefield ditch . . . . .	Fountain creek . . . . .	— — —, 1867	9.68	9.68	275.99	29
The Widefield ditch, first enlargement . . . . .	Fountain creek . . . . .	— — —, 1874	17.05	26.73	460.33	41
The Overton, Ames and Loomis ditch . . . . .	Fountain creek . . . . .	— — —, 1868	13.20	13.20	285.67	30
The Gaines and Love ditch . . . . .	Fountain creek . . . . .	Spring, 1871	11.34	11.34	298.87	31
The El Paso County ditch . . . . .	Fountain creek . . . . .	Fall, 1871	59.50	59.50	310.21	32
The Douglas ditch . . . . .	Fountain creek . . . . .	Spring, 1872	11.79	11.79	383.43	34
Iron and Irvine ditch . . . . .	Fountain creek . . . . .	Mar. —, 1873	6.00	6.00	395.22	35
Jackson and Burke ditch . . . . .	Fountain creek . . . . .	Spring, 1873	10.85	10.85	401.22	37
The Pike's Peak ditch . . . . .	Fountain creek . . . . .	— — —, 1863	12.64	12.64	412.07	38
The Pike's Peak ditch, first enlargement . . . . .	Fountain creek . . . . .	Aug. —, 1873	15.26	27.90	445.07	40
Clover Irrigation ditch . . . . .	Fountain creek . . . . .	Nov. 15, 1875	17.14	17.14	481.16	43
Bosworth and Hall ditch . . . . .	Fountain creek . . . . .	Feb. —, 1879	8.52	8.52	498.30	44
The Lincoln Ditch No. 2 . . . . .	Fountain creek . . . . .	Fall, 1881	2.25	2.25	515.38	47
The Templeton and Bloom ditch . . . . .	Fountain creek . . . . .	About 1862	16.52	16.52	517.63	. . .

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 10—Continued.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
The Straw ditch . . . . .	Fountain creek . . . . .	. . . . .	6.03	6.03	534.15	. . .
Total for Fountain creek . . . . .			540.18			
The Anchor ditch . . . . .	Monument creek . . . . .	Mar. —, 1867	2.14	2.14	0.00	1
The Diamond ditch . . . . .	Monument creek . . . . .	July 10, 1867	3.84	3.84	2.14	2
The Monument Creek ditch . . . . .	Monument creek . . . . .	June 20, 1868	4.58	4.58	5.98	3
The Monument Creek ditch, first enlargement . . . . .	Monument creek . . . . .	—, 1875	2.74	7.32	70.59	12
The Monitor ditch . . . . .	Monument creek . . . . .	June —, 1868	11.14	11.14	10.56	4
The Arapahoe ditch . . . . .	Monument creek . . . . .	June —, 1868	11.14	11.14	21.70	5
The Liered and Guire ditch . . . . .	Monument creek . . . . .	June —, 1868	4.12	4.12	32.84	6
The Star ditch . . . . .	Monument creek . . . . .	June 10, 1869	3.64	3.64	36.96	7
The Monument Ditch No. 2 . . . . .	Monument creek . . . . .	June —, 1870	4.80	4.80	40.60	8
The Monument Ditch No. 2½ . . . . .	Monument creek . . . . .	Summer, 1871	16.43	16.43	45.40	9
Walker and Brinker ditch . . . . .	Monument creek . . . . .	Spring, 1872	4.12	4.12	61.83	10
The Seventy-four ditch . . . . .	Monument creek . . . . .	June 10, 1874	4.64	4.64	65.95	11
Total for Monument creek . . . . .			73.33			

The W. W. Jones ditch . . . . .	West Monument creek . .	Spring, 1869	6.36	6.36	0.00	1
The Blodgett ditch . . . . .	West Monument creek . .	Spring, 1872	4.20	4.20	6.36	2
The Lennox ditch . . . . .	West Monument creek . .	Fall, 1873	7.95	7.95	10.56	3
The Head of the Creek ditch . . . . .	West Monument creek . .	—, 1876	2.01	2.01	18.51	4
The Clarke's Ditch No. 1 . . . . .	West Monument creek . .	—, 1876	1.66	1.66	20.52	5
Total from West Monument creek . . . . .			22.18			
*The Ditch No. 1 . . . . .	Bear creek . . . . .	*—, 1861				1
*The Matthews ditch . . . . .	Bear creek . . . . .	*Spring, 1863				2
*The Wellesley & Howbert ditch . . . . .	Bear creek . . . . .	*Fall, 1866				3
*The Wellesley & Fisher ditch . . . . .	Bear creek . . . . .	*Spring, 1875				4
*The Cheyenne Creek ditch . . . . .	Cheyenne creek . . . . .	*Sept. —, 1860				1
The Cheyenne Creek ditch, first enlargement . . . . .	Cheyenne creek . . . . .	*Spring, 1862				3
*The Lowry ditch . . . . .	Cheyenne creek . . . . .	*Fall, 1861				2
The Lowry ditch, first enlargement . . . . .	Cheyenne creek . . . . .	*Fall, 1863				7
The Harris ditch . . . . .	Cheyenne creek . . . . .	Mar —, 1863	15.90	15.90		4
The Alvord ditch . . . . .	Cheyenne creek . . . . .	May 10, 1863	4.28	4.28		5
The Wolf ditch . . . . .	Cheyenne creek . . . . .	Spring, 1863	12.52	12.52		6
*The John Wolf ditch . . . . .	Cheyenne creek . . . . .	*—, 1864				8
*The Dixon ditch . . . . .	Cheyenne creek . . . . .	*Fall, 1865				9
The Myers ditch . . . . .	Cheyenne creek . . . . .	—, 1871	2.15	2.15		10
*The Wm. Bastran ditch . . . . .	Cheyenne creek . . . . .	*April —, 1872				11
*The Harlan ditch . . . . .	Cheyenne creek . . . . .	Summer, 1872	2.64	2.64		12

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 10—Continued.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second previously appropriated in district.	Order of priority in district.
*The Kinsman ditch . . . . .	Cheyenne creek . . . . .	*—, 1875 . . . . .	1.50	1.50	0.00	1
The Hammond ditch . . . . .	Cheyenne creek . . . . .	Aug. —, 1877 . . . . .	39.07	1.58	1.58	14
Total (as far as given) for Cheyenne creek . . . . .						
The Marcott ditch . . . . .	Four-Mile creek . . . . .	April —, 1870 . . . . .	1.50	1.50	0.00	1
The Dorris ditch . . . . .	Four-Mile creek . . . . .	Spring, 1870 . . . . .	3.36	3.36	1.50	2
The Watson ditch . . . . .	Four-Mile creek . . . . .	Spring, 1872 . . . . .	1.78	1.78	4.86	3
The Watson ditch, first enlargement . . . . .	Four-Mile creek . . . . .	—, 1877 . . . . .	1.17	2.95	55.24	13
The Kittridge ditch . . . . .	Four-Mile creek . . . . .	June —, 1873 . . . . .	3.88	3.88	6.64	4
The Kittridge ditch, first enlargement . . . . .	Four-Mile creek . . . . .	May —, 1877 . . . . .	11.24	15.12	44.00	12
The Watson Ditch No. 2 . . . . .	Four-Mile creek . . . . .	Mar. —, 1874 . . . . .	2.71	2.71	10.52	5
The Watson Ditch No. 2, first enlargement . . . . .	Four-Mile creek . . . . .	. . . . .	3.65	6.36	29.55	10
The Riggs ditch . . . . .	Four-Mile creek . . . . .	April —, 1874 . . . . .	4.76	4.76	13.23	6
The Riggs Ditch No. 2 . . . . .	Four-Mile creek . . . . .	Spring, 1874 . . . . .	4.12	4.12	17.99	7
The Nolan ditch . . . . .	Four-Mile creek . . . . .	Spring, 1874 . . . . .	3.72	3.72	22.11	8
The Dome Rock ditch . . . . .	Four-Mile creek . . . . .	Spring, 1874 . . . . .	3.72	3.72	25.83	9

The Westall ditch . . . . .				—, 1875	10.80	10.80	33.20	11
Total from Four-Mile creek . . . . .					56.41			
The N. Z. Cozens ditch . . . . .				June —, 1870	3.40	3.40	0.00	1
The N. Z. Cozens Ditch No. 2 . . . . .				June —, 1870	4.80	4.80	3.40	2
The Walker ditch . . . . .				Spring, 1873	2.15	2.15	8.20	3
Total from Smith creek . . . . .					10.35			
Hammond Slough No. 1 . . . . .				*May —, 1865				1
The Robbins ditch . . . . .				*April —, 1868				2
The Slough Ditch No. 2 . . . . .				*April —, 1877				3
The Merriam Rock Creek ditch . . . . .				*June —, 1871				1
The Ames ditch . . . . .					4.00	4.00		2
The Welty ditch . . . . .				June —, 1867	3.90	3.90	0.00	1
The Shiedler ditch . . . . .				Spring, 1872	2.31	2.31	3.90	2
The Trigg ditch . . . . .				—, 1866	3.40	3.40	0.00	1
The Smith ditch . . . . .				—, 1870	2.36	2.36	0.00	1
*The Merriam ditch . . . . .				*June —, 1871			0.00	1
The Rose's Spring ditch . . . . .				May —, 1870	1.23	1.23	0.00	1
The Rose's Spring ditch, enlargement . . . . .				—, 1873	5.65	6.88	1.23	2
Total from Rose's Spring . . . . .					6.88			
*Camp Creek ditch . . . . .				*—, 1864				1
*The Neff, Hardwick & Chambers ditch . . . . .				*—, 1874				2
The Kittridge Ditch No. 2 . . . . .				May 21, 1870	2.71	2.71	0.00	1



STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 10—*Concluded.*

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF AP- PROPRIATION.	Cubic feet of wa- ter per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per sec- ond previously appropriated in district.	Order of priority in district.
The Colorado Springs Water Works ditch . . . . .	Ruxton creek . . . . .	Oct. —, 1878	3.10	3.10	0.00	1
*The Belcher ditch . . . . .	Shook's run . . . . .	* —, 1873				1
The Drury Creek ditch . . . . .	Drury creek . . . . .	—, 1872	5.12	5.12	0.00	1
The Liston Spring ditch . . . . .	Liston spring . . . . .	—, 1874	2.58	2.58	0.00	1
The Colton Slough ditch . . . . .	R. R. springs . . . . .	—, 1863	2.11	2.11	0.00	1

# SUMMARY FOR WATER DISTRICT No. 10.

WATER DISTRICT NO. 10.

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Total from Fountain creek . . . . .	549.18
Total from Monument creek . . . . .	73.33
Total from West Monument creek . . . . .	22.18
Total from Four-Mile creek . . . . .	56.41
Total from Smith creek . . . . .	10.35
Total from Beaver creek . . . . .	6.21
Total from Simpson's creek . . . . .	3.40
Total from Rose's spring . . . . .	6.88
Total from the "Pond" . . . . .	2.36
Total from West Four-Mile creek . . . . .	2.71
Total from Ruxton creek . . . . .	3.10
Total as far as given from Rock creek . . . . .	4.00
Total as far as given from Cheyenne creek . . . . .	39.07
Total from Drury creek . . . . .	5.12
Total from Liston spring . . . . .	2.58
Total from Colton slough . . . . .	2.11
Total as far as given from District No. 10 . . . . .	779.99

NOTE. —Those ditches marked with an \* had not sufficient *data* given from which to calculate their capacities.

The capacities of the ditches in this district are computed in the office of the State Engineer from the *data* contained in the decree, which gives the dimensions of each ditch.

## WATER DISTRICT No. 11.

*Water District No. 11—C. Eubank, Water Commissioner.* Appointed February 18, 1888. Address, Poncha Springs, Chaffee county, Colorado.

Water District No. 11 consists of all lands irrigated from ditches or canals taking water from that part of the Arkansas river lying in Chaffee county; also all lands irrigated from ditches or canals taking water from the tributaries of said portion of the Arkansas river.

No report has been received from the water commissioner of this district.

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 11, RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
The Mountain ditch . . . . .	{ Three-Mile creek. }	Aug. 25, 1887	Aug. 23, 1887	2.60	. . . . . Augustus Wentworth
Up Hill ditch . . . . .	{ Cottonwo'd creek. }	Aug. 31, 1887	July 16, 1887	3.20	. . . . . John Frame, Sr., W. J. Canover
Rosedale ditch . . . . .	Poncha creek	Sept. 19, 1887	May 29, 1883	2.00	. . . . . Frank M. Barnes
Warden & Co. ditch . . . . .	Chalk creek	Oct. 13, 1887	July 15, 1887	21.00	. . . . . M W. Warden et al.
Hale ditch. . . . .	{ Cochetopa creek. }	Nov. 28, 1887	Mar. 1, 1887	2.33	. . . . . Bradford Hale
Ronk Placer ditch No. 2 . . . . .	{ Arkansas river. }	Dec. 24, 1887	Sept. 26, 1887	80.00	. . . . . W. J. C. Ronk
The Fairmount canal, extension of Catlin Canal and Land Co.'s canal, } *Eggleston ditch No. 1 . . . . .	{ Natural Springs. }	Feb. 6, 1888	Nov. 14, 1887	239.00	{ The Fairmount Canal Co., H. H. Norton, Pres., C. H. Allen, Sec.
Maynard ditch . . . . .	{ Cottonwo'd creek. }	Mar. 28, 1888	. . . . .	1.00	. . . . . W. K. Eggleston
Kirsch ditch. . . . .	Clear creek.	April 6, 1888	Jan. 2, 1888	22.50	. . . . . C. G. Maynard
Harvard ditch. . . . .	{ Cottonwo'd creek. }	May 1, 1888	April 23, 1888	6.00	. . . . . Chris. Kireh
†Eggleston ditch No. 2 . . . . .	Waste water	May 4, 1888	Oct. 31, 1887	23.70	. . . . . Ranson Campbell et al.
Extension of the Riverside ditch . . . . .	{ Arkansas river. }	Aug. 14, 1888	. . . . .	2.00	. . . . . W. K. Eggleston
Bowen ditch . . . . .	. . . . .	Oct. 6, 1888	July 6, 1888	30.00	. . . . . Filmer E. Knapp et al.
	Chalk creek .	Oct. 27, 1888	Sept. 24, 1888	56.00	. . . . . George L. Smith et al.

\*Water claimed to have been appropriated and used since April 20, 1885.  
†Ditch said to have been constructed and water appropriated prior to May 14, 1887.

## WATER DISTRICTS Nos. 12, 13 AND 14.

*Water District No. 12*—No water commissioner has been appointed for this district.

Water District No. 12 consists of all lands irrigated from ditches or canals taking water from that part of the Arkansas river in Fremont county; also all lands irrigated from ditches or canals taking water from the tributaries of said portions of the Arkansas river, except Grape creek.

*Water District No. 13*—No water commissioner has been appointed for this district.

Water District No. 13 consists of all lands irrigated from ditches or canals taking water from Grape creek and its tributaries.

An adjudication of water rights in this water district was begun some years ago, but has never, so far as known, been pushed to a *conclusion*.

*Water District No. 14*—*W. P. Hobson, Water Commissioner*. Appointed June 29, 1885; address, Pueblo, Colorado.

Water District No. 14 consists of all lands irrigated from ditches or canals taking water from the Arkansas river, in Pueblo county; also all lands irrigated by ditches or canals taking water from the tributaries of the said Arkansas river, in the said county, (except) the St. Charles and its tributaries, and the Huerfano and its tributaries.

While the word "except," in parenthesis above, was omitted in the act of Legislature creating Water District No. 14, the evident intention of the Legislature is indicated in the description of Water Districts Nos. 15 and 16, embracing respectively the St. Charles and its tributaries, and the Huerfano and its tributaries.

In the distribution of water by this department, the description of Water District No. 14 has been interpreted to include the tributaries, except the St. Charles and



Huerfano, to the Arkansas river in Pueblo county, whether those tributaries extend into other counties or not.

A plat of this district, prepared from the report of the water commissioner thereof, and a graphical presentation of the discharge of the Arkansas river, are found in Part II. of this report.

There has been no decree issued by the courts governing appropriations of water in this district, though testimony has been taken relative to a number of ditches therein.

Mr. Hobson reports the following particulars concerning the ditches and the use made of water in Water District No. 14 for the year 1887:

STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 14, BY  
THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Hobson ditch . . . . .	3	126	10	85	70
*McBride ditch . . . . .	1			50	20
Fields ditch . . . . .	2½	20		60	80
Brooks ditch . . . . .	1½	16	6		15
Richey ditch . . . . .	1⅞			25	75
*Cape Horn ditch . . . . .	2		20	200	
Smith & Mahoney ditch . . . . .	2	15	7	4	60
Booth ditch . . . . .	4	90		300	105
Barnum ditch . . . . .	1½	30		120	17
Excelsior ditch . . . . .	7	154	70	735	552
Collier ditch . . . . .	7	124	100	200	430
*Ballen Hill ditch . . . . .	6	15		315	202
*Allen ditch . . . . .	2½			200	150
Arkansas Valley ditch . . . . .	10	354	70	460	388
Crook & Carlisle ditch . . . . .	2½	70			
Enterprise ditch . . . . .	3	35			182

NAME OF DITCH.	Length thereof in miles.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Sell ditch . . . . .	2				200
Banister ditch . . . . .	2	16		80	80
Toof (owner) ditch . . . . .	$\frac{3}{4}$	40			100
De Graff (owner) ditch . . . . .	2			100	
Wood Valley ditch . . . . .	3	5	10	200	80
Sutherland ditch . . . . .	3	10	5	45	40
*Bennish (owner) ditch . . . . .	3	10	5	40	25
Whipple ditch . . . . .	3	20		75	5
Grand View ditch . . . . .	2	75		40	50
Fahey ditch . . . . .	1				12
McElroy ditch . . . . .	$1\frac{1}{2}$	20	5	20	50
Cawfield ditch . . . . .	$\frac{3}{4}$	15		25	27
Chilcott ditch . . . . .	$2\frac{1}{2}$	50			10
Cozzens ditch . . . . .	$1\frac{1}{2}$	40		5	35
Hobson ditch . . . . .	5	40		300	25
Turner (wheel) ditch . . . . .	2				40
*Riverside (wheel) ditch . . . . .					40
*Morey & Haden (wheel) ditch . . . . .		10	5		50
Insane Asylum (wheel and steam pump) ditch. }		5	4		10
Sperry (wheel and reservoir) ditch . . . . .	$\frac{1}{4}$				35
Sater (wheel) ditch . . . . .	$\frac{3}{4}$			15	45
Totals . . . . .	$92\frac{3}{8}$	1,405	317	3,669	3,350

Where the \* is used the accompanying particulars concerning the ditch are estimated, and can only be considered approximate. The total area of land irrigated in Water District No. 14 is seen from the above statement to be about 8,741 acres.

Mr. Hobson reports the following particulars concerning the duties and the use made of water in Water District No. 14, for the year 1888:

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irri- gated therefrom.
West Pueblo . . . . .	401	69	6		110½
Cape Horn . . . . .	200	10	10	80	25
Fields . . . . .	185	13	3½		16
Richey . . . . .	100			10	61
Brooks . . . . .	40	16			30
Hamp . . . . .	192	53			113
Booth . . . . .	465	70	20	195	50
Booth Extension . . . . .	80	10		50	20
Barndollar . . . . .	190		15	135	
Excelsior . . . . .	1,640	141		830	280
Ballew Hill . . . . .	1,169	47	4	247	162
Arkansas Valley . . . . .	2,645	382	24	470	406
Enterprise . . . . .	775	62	1	50	162
Carlile & Clough . . . . .	1,100	65		215	444
Lewis Barnum . . . . .	330	35		35	11
Cawfield . . . . .	55	15		13	21
Chilcott . . . . .	160	100			8
Green View . . . . .	160	75		10	20
H. R. Steele . . . . .	35	18			1
McIlroy . . . . .	100	10	5	10	11
N. W. Steele . . . . .	37	5	1		17
Cawfield . . . . .	50	10		3	14
McNeal . . . . .	45			18	27
Benesch . . . . .	140	3		20	13
Espey . . . . .	240	18			38
Banister . . . . .	200	25		5	31
Poof . . . . .	160	40	5		30

NAME OF DITCH	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irri- gated therefrom
Young & Calloway . . . . .	150			40	
Wildeboor . . . . .	565	2		490	43
Benito . . . . .	40				40
Sutherland . . . . .	125	12		29	25
Whipple . . . . .	300	20			1
Lener . . . . .	100	20			
Hobson . . . . .	550	27		25	25
Maurice Rooney . . . . .	70	5	3	15	20
Hobson . . . . .	350	120	10	85	70
McBride . . . . .	150			50	20
	13,694	1,612	107½	3,130	2,415

So that there were irrigated in this district, from about 92 miles of ditches, 1,612 acres of alfalfa, 107½ acres of seeded grasses other than alfalfa, 3,130 acres of natural grasses, and 2,415 acres of crops other than grasses, amounting in all to 7,264½ acres, while the area of land in this district lying under the ditches which might be irrigated therefrom is about 13,694 acres.

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 14,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Young & Calloway ditch . . . . .	{ Fontaine {	Sept. 6, 1887	Aug. 4, 1887	47.60	. . . . . David DeGraf
Hobson ditch . . . . .	{ Qui Bonille {	Sept. 19, 1887	June 10, 1887	23.20	{ The National Land and Imp. Co., Wm. A. Bell, vice pres.; W. H. Hobson.
The Fowler Colony Co.'s ditch . . . . .	Arkansas riv.	Nov. 23, 1887	Feb. 26, 1887	142.74	{ The Fowler Colony Irrigation and Industrial Co., C. W. Fentason, sec.
Laucaster ditch . . . . .	Fountain . . . . .	Jan. 29, 1888	—, 1874	3.00	. . . . . S. J. Rooney, Christianna M. Rooney
Laucaster ditch, enlargement, . . . . .	Fountain . . . . .	Jan. 29, 1888	May 17, 1888	27.00	. . . . . S. J. Rooney, Christianna M. Rooney
Maurice Rooney ditch . . . . .	Fountain . . . . .	Jan. 29, 1888	—, 1876	2.00	. . . . . Mrs. Johanna M. Rooney
Maurice Rooney ditch, enlargement . . . . .	Fountain . . . . .	Jan. 29, 1888	Mar. —, 1884	5.00	. . . . . Mrs. Johanna M. Rooney
Underwood ditch . . . . .	L. Turkey cr.	Feb. 15, 1888	July —, 1875	10.40	. . . . . Frank A. Perkins et al.
Schlucekbier ditch . . . . .	L. Turkey cr.	Mar. 12, 1888	Mar. —, 1874	5.10	. . . . . F. Schlucekbier
West Pueblo ditch, . . . . .	Arkansas riv.	Mar. 16, 1888	. . . . .	4.27	{ The W. Pueblo Ditch and Res. Co., A. C. Haden, pres.; Chas. H. Small, sec.
West Pueblo ditch, enlargement . . . . .	Arkansas riv.	Mar. 16, 1888	Dec. 17, 1887	26.09	{ The W. Pueblo Ditch and Res. Co., A. C. Haden, pres.; Chas. H. Small, sec.
*Booth ditch, enlargement and extension	Arkansas riv.	April 5, 1888	Mar. 30, 1888	19.50	. . . . . Peter Mueller, Eva Goldsmith
Brackett ditch No. 1, . . . . .	Brackett crk.	April 19, 1888	Mar. 3, 1888	4.00	. . . . . Alice J. Starkweather
†Ditch No. 1, . . . . .	Hay creek . . . . .	Aug. 27, 1888	. . . . .	10.00	. . . . . D. L. Jackson

\*The capacity of the Booth ditch, before enlargement, is claimed to be 46.2 cubic feet per second.

†Survey begun April 3, 1888.



## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 14,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed therefor, in cubic feet.	NAME OF CLAIMANT.
Hobson Reservoir No. 1.	Fountain	Hobson ditch	April 6, 1888	Jan. 10, 1888	4,626,551	W. P. Hobson
Hobson Reservoir No. 2.	Fountain	Hobson ditch	April 6, 1888	Jan. 10, 1888	1,076,301	W. P. Hobson
Hobson Reservoir No. 3.	Fountain	Hobson ditch	April 6, 1888	Jan. 10, 1888	1,136,132	W. P. Hobson
Hobson Reservoir No. 4.	Fountain	Hobson ditch	April 6, 1888	Jan. 10, 1888	1,637,159	W. P. Hobson

## STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 14,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inches).	Length of case, (in feet).	DEPTH OF FLOW BELOW SURFACE.				LOCATION.	Present flow in gallons per minute.
				First flow.	Second flow.	Third flow.	Fourth flow.		
J. R. Fariss. . . . .	1,217	8	1,217	1,172	. . . . .	. . . . .	1,217	Pueblo . . . . .	20
Clark Magnetic Mineral Spring Co. . . . .	1,402	6	900	1,166	. . . . .	. . . . .	1,166	Pueblo . . . . .	87½

*Water District No. 15, R. A. Wiggins, Water Commissioner.* Appointed April 14, 1887. Post-office address, Pueblo, Colorado.

Water District No. 15 consists of all lands irrigated from ditches or canals taking water from the St. Charles and its tributaries.

A plat of this district, prepared from the report of the water commissioner thereof, is found in Part II. of this report.

Mr. Wiggins reports the following particulars relative to ditches and the use made of water in his district as approximately correct:

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 15, BY THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Smith . . . . .	1 $\frac{3}{4}$	51	2		100	
Lamb . . . . .	1 $\frac{1}{2}$	35			100	3
Powell . . . . .	1 $\frac{1}{4}$	10			20	5
Davis . . . . .	1	40	5		75	
O'Connell . . . . .	2	50	4		100	
Stanley . . . . .	1 $\frac{1}{2}$	100	80		100	80
Mills . . . . .	1	15	8		15	
Scroggs . . . . .	2 $\frac{1}{2}$	80	39		70	60
Finlay . . . . .	2	20	6		25	11
Dunbaugh . . . . .	1	15	15		12	3
Harden . . . . .	$\frac{1}{2}$	12		10	2	24
Ashbaugh . . . . .	$\frac{1}{4}$	18		2		45
Greenhorn . . . . .	8 $\frac{1}{2}$	200	17	15	275	15
Hicklin . . . . .	1	50			50	26
Hicklin . . . . .	1 $\frac{1}{2}$	35	5			60
Hicklin . . . . .	2	110	50		10	100
Hicklin . . . . .	2	50	5		40	10

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Jamison . . . . .	1	40	6	40	10	25
Lloyd . . . . .	½	15	15			
Cavines . . . . .	1½	10	10		10	
More . . . . .	3	53	12	14	6	75
Nichols . . . . .	2	20	8		30	20
Excelsior . . . . .	½	10		13		2
Saunders . . . . .	½	10		10		10
Peterson . . . . .	1½	50	8	13	15	65
Fisher . . . . .	1	34		18	10	40
Peterson . . . . .	¾	10				10
Colorado R. Co . . . . .	5	420	120		300	180
Polard . . . . .	4	55	85			20
Wing . . . . .	½	20	15			15
McDowell . . . . .	½	10	10			
Hill . . . . .	1	25	12		2	20
Randall . . . . .	¾	18	4	4		20
Suttles . . . . .	1½	50				75
Tucker . . . . .	2½	40	36		1	28
Edson . . . . .	2	20	16			18
Chase . . . . .	2	10	15			2
N. J. . . . .	2	30	19		12	30
Goss . . . . .	¼	15	5	2	2	8
Haney . . . . .	2½	70	34		10	58
Beckwith . . . . .	¾	50	10	20	20	10
Edmonson . . . . .	1½	40			70	
Branan . . . . .	¾	50			75	
Ranchley . . . . .	1	30	30			
Bryson . . . . .	7	205	63	9	90	177
Warner . . . . .	1¾	150	19	78	12	66
Depp . . . . .	1½	56	10	10	20	26

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Duckworth . . . . .	1¼	40	. . . . .	. . . . .	18	58
Higerson . . . . .	4	84	20	2	60	50
Hugins . . . . .	1	40	14	7	12	25
Dinkenger . . . . .	2½	100	60	. . . . .	. . . . .	60
Totals . . . . .	91½	2,771	892	267	1,779	1,605



## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 15,

RELATIVE TO WHICH PLATS AND STATEMENTS HAVE BEEN FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS  
TO DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon	Capacity claimed in cubic feet per sec.	NAME OF CLAIMANT.
Wagner ditch . . . . .	St. Charles river .	Mar. 29, 1888.	About 1886	36.00	Fred O. Jones <i>et al</i>
Wagner ditch, enlargement thereof . .	St. Charles river .	Mar. 29, 1888	Dec. 6, 1887	10.80	Fred O. Jones <i>et al</i>
Bryson ditch . . . . .	South St. Charles river. . . . .	June 27, 1888	Oct. —, 1883	33.33	J. M. Bryson <i>et al</i>
* Woodland ditch, enlargement . . . .	Big Granceros crk	Oct. 27, 1888	Aug. 1, 1888	27.60	A. D. Mason and John Medill

\* Original capacity equal 17.62 cubic feet; increase of capacity by enlargement equal 27.60; total capacity 45.22. Date of original construction, April 1, 1871.

## WATER DISTRICT No. 16.

*Water District No. 16—L. Z. Watkins, Water Commissioner.* Appointed April 11, 1887. Address, Gardner, Huerfano county, Colorado.

Water District No. 16 consists of all lands irrigated by ditches or canals taking water from the Huerfano river and its tributaries. A plat of this district, prepared from the report of the water commissioner thereof, is found in Part II. of this report. Unfortunately, two referees for Water District No. 16 have been appointed to take evidence, report upon the same to the court, etc. It is provided in section 1762 of the General Statutes, that "when any water district shall extend into two or more counties, the district court of the county in which the first regular term, after the first day of December in each year, shall soonest occur, according to the law then in force, shall be the proper court in which the proceedings for said purpose, as hereinafter provided for, shall be commenced." By "said purpose," is meant the "adjudication of water rights." It is also provided in the same section, that "when said proceedings shall be once commenced, by the entry of the order appointing a referee, in the manner and for the purpose hereinafter in this act provided, such court shall thereafter retain exclusive jurisdiction of the whole subject, until final adjudication thereof is had, notwithstanding any law to the contrary now in force." It appears that Water District No. 16 extends into two counties and two judicial districts, and that proceedings in this matter were commenced in that district court where the first regular term did not occur the soonest after December first, and that the referee was appointed by the court to take testimony, etc., relative to water rights in this water district; that subsequently another referee was appointed by the other court, into whose judicial district this

water district extended, and that both referees, so appointed, attempted to take testimony, report, etc. This condition of affairs is, of course, very perplexing to the users of water in Water District No. 16.

Mr. Watkins reports the particulars set forth in the under-written statement concerning the ditches and the use made of water in his district. They indicate a condition of irrigation development peculiar to but few water districts in the State. It can not, of course, be expected that in every particular these statements should be perfectly correct. Mr. Watkins deserves especial commendation for his efforts to furnish this department with this information concerning his district, which evidently required a great deal of labor on his part.

Mr. Watkins' report relates to that portion of his district embraced in Huerfano county, and includes nothing in the county of Pueblo. This is in harmony with a feeling recently recognized as existing, leading to such an interpretation of the descriptions of water districts in Water Division No. 2, as would make that part of the Huerfano river, and its tributaries in Huerfano county, a district by itself. It may be that the courts looked at the matter in that light. It is certainly unadvisable and is believed to be unwarranted.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 16,  
BY THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles.	No. of days water was carried therein during the irrigat- ing season of 1888.	Average amount of water carried dur- ing season of 1888, cubic ft. per second.
H. T. Chapple . . . . .	$\frac{1}{4}$	4	$\frac{1}{2}$
T. H. Muchmore . . . . .	$\frac{3}{2}$	2	$\frac{1}{2}$
Smithmann . . . . .	$\frac{1}{2}$	7	1
Timothy . . . . .	$\frac{1}{4}$	30	$\frac{1}{2}$
Sheep Creek . . . . .	$\frac{1}{4}$	7	1
Potato Creek . . . . .	$\frac{3}{4}$	100	2
Sharpsdale . . . . .	$\frac{5}{8}$	14	2
Mosco . . . . .	$\frac{1}{2}$	7	1
Archuleta . . . . .	$2\frac{1}{2}$	120	6
No. 1 . . . . .	.6	150	10
Palmer . . . . .	$.4\frac{1}{2}$	150	7
Ramon M. Y. Valdes . . . . .	$.4\frac{3}{4}$	150	4
Upper Huerfano . . . . .	$.6\frac{1}{2}$	150	9
Sefton No. 1 . . . . .	.2	60	3
Sefton No. 2 . . . . .	$\frac{1}{2}$	60	$1\frac{1}{2}$
Sefton No. 3 . . . . .	$.1\frac{1}{4}$	30	1
Mangenarus, No. 1 . . . . .	.2	120	6
Mangenarus, No. 2 . . . . .	$\frac{1}{2}$	60	2
Montez Co. . . . .	.5	120	14
Pioneer . . . . .	.4	90	5
J. A. J. Wilson . . . . .	$\frac{1}{4}$	3	1
May . . . . .	$.1\frac{1}{2}$	120	10.2
Garden . . . . .	$\frac{1}{2}$	90	1
South Side . . . . .	$\frac{3}{4}$	90	2
Deus . . . . .	$\frac{1}{4}$	10	1
Martine & Rahn . . . . .	$.1\frac{1}{4}$	120	2
Fillippi . . . . .	.2	95	3
Madina . . . . .	.1	95	2
Navaujo & Archuleta . . . . .	$1\frac{1}{2}$	95	2

NAME OF DITCH.	Length thereof in miles.	No. of days water was carried therein during the irrigat- ing season of 1888.	Average amount of water carried dur- ing season of 1888, cubic ft. per second.
Burns . . . . .	2 . . . . .	130 . . . . .	21 $\frac{3.1}{100}$
Sanchez . . . . .	$\frac{5}{8}$ . . . . .	150 . . . . .	14 $\frac{8.8}{100}$
Mill and Irrigating . . . . .	2 . . . . .	80 . . . . .	43 $\frac{4}{100}$
Gardner Co. . . . .	18,411 ft . . . . .	30 . . . . .	18 $\frac{5.5}{100}$
Vigil & Chaves . . . . .	$4\frac{3}{4}$ . . . . .	90 . . . . .	45 $\frac{7.7}{100}$
Hamlett . . . . .	$1\frac{1}{4}$ . . . . .	120 . . . . .	7
J. D. Patterson . . . . .	$\frac{1}{4}$ . . . . .	90 . . . . .	1
Meadow No. 2 . . . . .	$\frac{3}{4}$ . . . . .	30 . . . . .	$1\frac{2}{5}$
Roy . . . . .	$\frac{3}{4}$ . . . . .	70 . . . . .	3
Chaves . . . . .	$1\frac{1}{2}$ . . . . .	100 . . . . .	18 $\frac{6.2}{100}$
Moeler . . . . .	$\frac{1}{4}$ . . . . .	4 . . . . .	1
Snow . . . . .	$1\frac{1}{4}$ . . . . .	90 . . . . .	1
Emmerson . . . . .	$\frac{3}{4}$ . . . . .	4 . . . . .	2
Watkins . . . . .	$1\frac{1}{2}$ . . . . .	20 . . . . .	2
Brooks Creek . . . . .	1 . . . . .	30 . . . . .	2
Meadow . . . . .	$\frac{1}{2}$ . . . . .	7 . . . . .	1
McHarg . . . . .	$1\frac{3}{4}$ . . . . .	60 . . . . .	2
Hornback . . . . .	$1\frac{1}{4}$ . . . . .	15 . . . . .	2
Murray . . . . .	$\frac{3}{4}$ . . . . .	30 . . . . .	1
R. M. Lincoln No. 1 . . . . .	1 . . . . .	5 . . . . .	1
R. M. Lincoln No. 2 . . . . .	$\frac{3}{4}$ . . . . .	5 . . . . .	2
R. M. Lincoln No. 3 . . . . .	$\frac{1}{2}$ . . . . .	4 . . . . .	3
McClure . . . . .	$1\frac{1}{8}$ . . . . .	12 . . . . .	2
Bradford & Swire . . . . .	2 . . . . .	110 . . . . .	6
Joe Murray . . . . .	$2\frac{3}{4}$ . . . . .	90 . . . . .	3
Glade . . . . .	2 . . . . .	70 . . . . .	3
Road . . . . .	$\frac{1}{2}$ . . . . .	70 . . . . .	2
Muddy Creek . . . . .	$1\frac{3}{4}$ . . . . .	70 . . . . .	3
Robinson . . . . .	$2\frac{1}{2}$ . . . . .	90 . . . . .	4
Houser . . . . .	$2\frac{1}{4}$ . . . . .	90 . . . . .	2
Quillian No. 1 . . . . .	$\frac{5}{8}$ . . . . .	75 . . . . .	3



NAME OF DITCH.	Length thereof in miles.	No. of days water was carried therein during the irrigating season of 1888.	Average amount of water carried during season of 1888, cubic ft. per second.
Quillian No. 2 . . . . .	$\frac{1}{2}$ . . . . .	75 . . . . .	3
Quillian No. 3 . . . . .	$\frac{1}{4}$ . . . . .	75 . . . . .	3
Quillian No. 4 . . . . .	$\frac{1}{4}$ . . . . .	75 . . . . .	3
Wilburn No. 1 . . . . .	$\frac{3}{4}$ . . . . .	60 . . . . .	3
Wilburn No. 2 . . . . .	$\frac{1}{2}$ . . . . .	60 . . . . .	2
Wilburn No. 3 . . . . .	$\frac{1}{4}$ . . . . .	60 . . . . .	2
Owens . . . . .	$1\frac{1}{2}$ . . . . .	60 . . . . .	2
W. T. Frink . . . . .	$\frac{3}{4}$ . . . . .	21 . . . . .	4
Fernandez . . . . .	$1\frac{1}{2}$ . . . . .	120 . . . . .	5
West Side . . . . .	$1\frac{1}{2}$ . . . . .	60 . . . . .	1
West Fork No. 1 . . . . .	3 . . . . .	60 . . . . .	4
West Fork No. 2 . . . . .	$\frac{3}{4}$ . . . . .	120 . . . . .	2
Meas No. 1 . . . . .	$\frac{1}{2}$ . . . . .	90 . . . . .	1
Meas No. 2 . . . . .	$\frac{1}{2}$ . . . . .	90 . . . . .	1
J. D. Ortobeas No. 1 . . . . .	$\frac{1}{4}$ . . . . .	60 . . . . .	1
J. D. Ortobeas No. 2 . . . . .	$\frac{1}{4}$ . . . . .	60 . . . . .	1
Martine No. 1 . . . . .	$\frac{3}{4}$ . . . . .	60 . . . . .	1
Martine No. 2 . . . . .	$\frac{1}{4}$ . . . . .	60 . . . . .	1
Riell . . . . .	$\frac{1}{4}$ . . . . .	120 . . . . .	1
Manwell, Ortobeas . . . . .	$\frac{3}{4}$ . . . . .	75 . . . . .	1
David Chavez . . . . .	$\frac{3}{4}$ . . . . .	75 . . . . .	1
Aut Quintano . . . . .	$2\frac{1}{2}$ . . . . .	30 . . . . .	8
The Harms . . . . .	2 . . . . .	120 . . . . .	5
Garcia . . . . .	3 . . . . .	60 . . . . .	8
St. Stephen . . . . .	$\frac{1}{2}$ . . . . .	90 . . . . .	2
Pioneer . . . . .	2 . . . . .	60 . . . . .	6
Martine . . . . .	$4\frac{3}{4}$ . . . . .	60 . . . . .	14
J. M. Jaques . . . . .	1 . . . . .	30 . . . . .	6
Pino . . . . .	2 . . . . .	120 . . . . .	6
Martine No. 1 . . . . .	3 . . . . .	150 . . . . .	6
The Craig . . . . .	1 . . . . .	70 . . . . .	3

NAME OF DITCH.	Length thereof in miles.	No. of days water was carried therein during the irrigating season of 1888.	Average amount of water carried during season of 1888, cubic ft per second.
St. Mary's	1	60	2
Mahan	2½	120	2
J. W. Brown	2½	90	6
Z. Allen	1½	5	2
St. Verine	1½	75	3
Gomez	2½	70	4
Proffitt	⅛	10	1
Butte Valley	2¾	130	7
Rice	12,224 feet	30	4
Moore	3½	7	6
Madrill	1¾	30	2
Meases & Co	2¼	90	5
Burns	5¼		6
Sanders	½	10	1
Karl	⅛	4	1
Caldwell	2¼	60	3
Gunlett	1¼	60	3
Spring	½	90	1
R. D. Caldwell	1	60	3
Candalario	½	15	1
Hoffman	¾	90	1
Archuleta No. 1	¾	60	1
Garcia	1½	60	1
Montoya	1¼	60	2
Navaujo	¾	120	2
Valdes No. 1	½	90	1
Nolasco No. 1	½	60	1
Baker No. 1	¼	60	1
Baker No. 2	¾	Not used	1
Baker No. 3	Not completed		
Spider Web No. 1	1½	Not used	2

NAME OF DITCH.	Length thereof in miles.	No. of days water was carried therein during the irrigation season of 1888.	Average amount of water carried during season of 1888, cubic feet per sec.
Spider Web No. 2 . . . . .	1¼ . . . . .	140 . . . . .	2
Petty No. 1 . . . . .	2¼ . . . . .	65 . . . . .	2
Petty No. 2 . . . . .	1 . . . . .	90 . . . . .	2
Cisnerous No. 1 . . . . .	1½ . . . . .	150 . . . . .	4
Cisnerous No. 2 . . . . .	½ . . . . .	150 . . . . .	2
J. H. Craig . . . . .	½ . . . . .	. . . . .	1
Elena Baca . . . . .	¼ . . . . .	60 . . . . .	2
Ojo . . . . .	1 . . . . .	180 . . . . .	1
Mias creek . . . . .	1½ . . . . .	75 . . . . .	5
Valdez No. 2. . . . .	1 . . . . .	110 . . . . .	4
Valdez No. 3. . . . .	¼ . . . . .	120 . . . . .	2
Romeriz . . . . .	1 . . . . .	120 . . . . .	1
Romeriz No. 2. . . . .	⅛ . . . . .	. . . . .	1
Dolores Garcia . . . . .	¼ . . . . .	90 . . . . .	1
Apadaca No. 1. . . . .	1 . . . . .	120 . . . . .	1
Apadaca No. 2. . . . .	¾ . . . . .	120 . . . . .	1
Flora Montez . . . . .	¼ . . . . .	60 . . . . .	2
Flora Montez No. 2 . . . . .	¼ . . . . .	30 . . . . .	2
J. M. Montez . . . . .	½ . . . . .	75 . . . . .	4
Quintana . . . . .	¼ . . . . .	60 . . . . .	1
Montana . . . . .	¾ . . . . .	75 . . . . .	1
Castora . . . . .	½ . . . . .	75 . . . . .	1
Turkey creek . . . . .	1 . . . . .	90 . . . . .	2
Victor Montoya No. 1 . . . . .	1 . . . . .	75 . . . . .	1
L. A. Harms . . . . .	2½ . . . . .	120 . . . . .	1
Vigil. . . . .	1¼ . . . . .	20 . . . . .	2
Frau Martine . . . . .	½ . . . . .	30 . . . . .	2
Victor Montoya No. 2 . . . . .	½ . . . . .	30 . . . . .	1
M. Archuleta . . . . .	1 . . . . .	60 . . . . .	1
Ramon Trujilla . . . . .	½ . . . . .	60 . . . . .	1
Ma Aut Sanchez . . . . .	½ . . . . .	60 . . . . .	1

NAME OF DITCH	Length thereof in miles.	No. of days water was carried therein during the irrigation season of 1888.	Average amount of water carried during season of 1888, cubic feet per sec.
Auguste Labato . . . . .	$\frac{1}{2}$	75	1
Martine & Sons No. 1 . . . . .	$\frac{1}{4}$	120	3
Martine & Sons No. 2 . . . . .	$\frac{1}{2}$	Used only No. 1.	Headgate gone.
Nunda . . . . .	$\frac{1}{2}$	120	1
Rock Wall No. 1. . . . .	$\frac{1}{2}$	120	1
Rock Wall No. 2. . . . .	$\frac{1}{2}$		1
R. W. Willis No. 1. . . . .	$1\frac{1}{4}$	120	2
Carpenter . . . . .	2	15	1
J. W. Smith No. 1. . . . .	$\frac{1}{4}$	30	1
John G. Cozad No. 1. . . . .	2	10	4
John G. Cozad No. 2 . . . . .	2	10	4
Cuchara . . . . .	Not known	40	Not known
Julius G. Kruger . . . . .	$\frac{1}{4}$	120	$1\frac{1}{2}$
Bruce No. 1. . . . .	$\frac{3}{4}$	120	2
Bruce No. 2 . . . . .	$\frac{1}{2}$	3	1
George Kitchen . . . . .	$\frac{1}{2}$	120	1
Butte . . . . .	$5\frac{3}{4}$	115	13
Philip S. Side . . . . .	$\frac{3}{4}$	2	2
Patterson . . . . .	$1\frac{3}{4}$	90	4
Patterson extension. . . . .	2	120	4
Montey . . . . .	$\frac{1}{2}$	20	1
Edmonds . . . . .	$\frac{1}{2}$	10	1
Ward & Edmonds. . . . .	$1\frac{1}{4}$	20	2
Francisco & Dargere . . . . .	$3\frac{1}{4}$	120	15
La Veta Mill. . . . .	$\frac{1}{4}$		
La Veta Town. . . . .	1	120	16
Calf Pasture . . . . .	1	120	12
B. F. Palmer . . . . .	$\frac{1}{2}$	30	2
F. L. Martin No. 2 . . . . .	$\frac{1}{4}$	30	6
Nathe Patterson . . . . .	$1\frac{3}{4}$	120	5
Moore . . . . .	$\frac{1}{8}$	120	1

NAME OF DITCH.	Length thereof in miles.	No. of days water was carried therein during the irrigating season of 1888.	Average amount of water carried during season of 1888, cubic ft. per second.
L. D. R. D. . . . .	½ . . . .	120 . . . .	3
Denton . . . . .	¼ . . . .	140 . . . .	2
John Brown . . . . .	½ . . . .	120 . . . .	4
Sefton H. T. No. 1. . . . .	1½ . . . .	120 . . . .	2
Sefton H. T. No. 2. . . . .	¼ . . . .	15 . . . .	1
Sefton H. T. No. 3. . . . .	½ . . . .	12 . . . .	1
Sefton H. T. No. 4. . . . .	¼ . . . .	30 . . . .	1
So. Veta Highland . . . . .	2½ . . . .	120 . . . .	not known
Alexander & Kincaide . . . . .	½ . . . .	40 . . . .	2
Alexander & Barnard . . . . .	¾ . . . .	120 . . . .	2
Sandoval South . . . . .	¾ . . . .	90 . . . .	2
Sandoval North . . . . .	1¼ . . . .	90 . . . .	2
H. B. Sager . . . . .	550 feet . . . .	90 . . . .	1
Highland . . . . .	2 . . . .	120 . . . .	2
Ute . . . . .	¼ . . . .	60 . . . .	1
Indian Creek . . . . .	¼ . . . .	4 . . . .	1
Hardy & Barnard . . . . .	1¼ . . . .	60 . . . .	1
J. Y. Owenby . . . . .	½ . . . .	30 . . . .	1
Owenby Bros . . . . .	1¼ . . . .	150 . . . .	1
F. M. Owenby . . . . .	2 . . . .	90 . . . .	1
Fain & Martin . . . . .	½ . . . .	120 . . . .	2
Sallee No. 1 . . . . .	¼ . . . .	14 . . . .	1
Sallee No. 2 . . . . .	¼ . . . .	14 . . . .	1
McDonald No. 1 . . . . .	2 . . . .	45 . . . .	1
McDonald No. 2 . . . . .	½ . . . .	45 . . . .	1
Stapeland . . . . .	¾ . . . .	140 . . . .	2
J. E. Parks . . . . .	¾ . . . .	4 . . . .	1
Carver . . . . .	¾ . . . .	90 . . . .	1
<u>Z</u> . . . . .	2 . . . .	20 . . . .	6
Smith Crumley . . . . .	640 yds . . . .	15 . . . .	1
David Heart . . . . .	⅝ . . . .	30 . . . .	1



NAME OF DITCH.	Length thereof in miles.	No. of days water was carried therein during the irrigating season of 1888.	Average amount of water carried during season of 1888, cubic ft. per second.
Gribble & Baker . . . . .	2	90	1
Gribble No. 1 . . . . .	$\frac{3}{4}$	120	1
Z. Gribble . . . . .	$\frac{1}{4}$	50	1
Plaza . . . . .	$\frac{3}{4}$	6	4
Wayman . . . . .	3	35	3
McOlive & Denton . . . . .	500 yds.	100	12½
Spanish Peaks' Co . . . . .	3	90	9
Beaver Dam . . . . .	$\frac{1}{4}$	120	2
Walsen No. 1 . . . . .	1	180	3
Walsen No. 2 . . . . .	1½	160	6
Trugilla . . . . .	1	90	4
Romerez No. 1 . . . . .	2	90	5
Theo. Meas . . . . .	$\frac{1}{4}$		1
Vigil Bros . . . . .	2¼	60	6
J. Pachaca . . . . .	$\frac{3}{4}$	60	1
Bear ditch . . . . .	3½	120	5
Walsenburg Town . . . . .	4	90	12
Gomez No. 1 . . . . .	1¼	120	7
Jean George . . . . .	1½	120	11
Madrill No. 1 . . . . .	5	115	10
Madrill No. 2 . . . . .	2½	75	3
Mexican . . . . .	1½	70	6
Lake Merriam . . . . .	7	130	55
Sanchez No. 3 . . . . .	2½	140	16
Plasa . . . . .	7	90	5
Ant Sanchez . . . . .	1		1
Lionetus Valdes . . . . .	1½		2
Marbit . . . . .	3	15	30
Kincade No. 1 . . . . .	520 feet	75	4
Kincade No. 2 . . . . .	$\frac{1}{8}$	30	1
Walsen Veta . . . . .	2	60	6

NAME OF DITCH.	Length thereof in miles	No. of days water was carried therein during the irrigating season of 1888.	Average amount of water carried during season of 1888, cubic ft. per second.
Clamenta Trugetta . . . . .	$\frac{1}{4}$ . . . . .	1 . . . . .	1
Vigil . . . . .	1 . . . . .	75 . . . . .	$118\frac{22}{100}$
Price, Mertus & Haldy . . . . .	$\frac{1}{2}$ . . . . .	15 . . . . .	$22\frac{1}{2}$
La Bata . . . . .	1 . . . . .	30 . . . . .	2
Simons . . . . .	$\frac{1}{2}$ . . . . .	20 . . . . .	1
Jas. Lam . . . . .	1 . . . . .	14 . . . . .	2
Chas. Lam . . . . .	$\frac{1}{2}$ . . . . .	75 . . . . .	2
Foristine . . . . .	1 . . . . .	75 . . . . .	3
Cullum . . . . .	$\frac{1}{4}$ . . . . .	40 . . . . .	2
Sam'l J. Capps . . . . .	$\frac{1}{3}$ . . . . .	120 . . . . .	1
Hickland . . . . .	$3\frac{1}{4}$ . . . . .	115 . . . . .	
Kinsey . . . . .	3 . . . . .		3
Graham . . . . .	No de scription to be had.		
D. K. L. M. & C. K . . . . .	$7\frac{1}{8}$ . . . . .	8 . . . . .	13
Cavines . . . . .	$\frac{3}{4}$ . . . . .	10 . . . . .	2
Zan Hickland . . . . .	$1\frac{1}{4}$ . . . . .	30 . . . . .	6
A. J. Dodgins . . . . .	$\frac{3}{4}$ . . . . .	30 . . . . .	4
Jas. Patterson . . . . .	300 yds . . . . .	30 . . . . .	3
Whitman & Mott . . . . .	$1\frac{1}{4}$ . . . . .	30 . . . . .	$23\frac{3}{5}$
Palmer No. 2 . . . . .	$\frac{1}{4}$ . . . . .		3
Shields . . . . .	250 yds . . . . .	60 . . . . .	$8\frac{76}{100}$

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 16,  
BY THE WATER COMMISSIONER.

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, oth- er than alfalfa, irri- gated therefrom.	Number of acres of natural grasses ir- rigated therefrom.	Number of acres of other crops irrigat- ed therefrom.
H. T. Chapp e . . . . .	5 . . . . .				5
T. H. Muchmore . . . . .	2 . . . . .				2
Smithman . . . . .	4 . . . . .				2
Timothy . . . . .	30 . . . . .		8 . . . . .		20
Sheep Creek . . . . .	40 . . . . .				18
Potato . . . . .	20 . . . . .		4 . . . . .		18
Sharpsdale . . . . .	6 . . . . .		2 . . . . .		4
Mosco . . . . .	3 . . . . .				3
Archuleta , . . . .	400 . . . . .	4 . . . . .		160 . . . . .	65
No. 1 . . . . .	1,100 . . . . .	3 . . . . .	4 . . . . .	50 . . . . .	450
Palmer . . . . .	800 . . . . .	7 . . . . .	135 . . . . .	90 . . . . .	200
Ramon M. Y. Valdes . . . . .	265 . . . . .	1 . . . . .			110
Upper Huerfano . . . . .	1,110 . . . . .	10 . . . . .	20 . . . . .	500 . . . . .	80
Sefton No. 1 . . . . .	300 . . . . .	25 . . . . .	50 . . . . .	50 . . . . .	20
Sefton No. 2 . . . . .	100 . . . . .		30 . . . . .	30 . . . . .	10
Sefton No. 3 . . . . .	40 . . . . .			5 . . . . .	10
Mangenarus No. 1 . . . . .	260 . . . . .			127 . . . . .	60
Mangenarus No. 2 . . . . .	50 . . . . .		30 . . . . .		15
Montez & Co . . . . .	1,400 . . . . .				60
Pioneer . . . . .	500 . . . . .			130 . . . . .	58
J. A. J. Wilson . . . . .	20 . . . . .		20 . . . . .		
May . . . . .	300 . . . . .		15 . . . . .	120 . . . . .	12
Gardin . . . . .	20 . . . . .	1 . . . . .		2 . . . . .	9
South Side . . . . .	30 . . . . .		10 . . . . .		15
Deus . . . . .	30 . . . . .				6
Martine & Rahn . . . . .	85 . . . . .			60 . . . . .	25
Felippi . . . . .	200 . . . . .			30 . . . . .	
Medina . . . . .	80 . . . . .			40 . . . . .	10
Navaujo & Archuleta . . . . .	240 . . . . .			60 . . . . .	40

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irrigated therefrom.
Burns . . . . .	200 . . . . .	50 . . . . .		50 . . . . .	15 . . . . .
Sanchez . . . . .	50 . . . . .				10 . . . . .
Mill and Irrigating . . . . .	200 . . . . .	15 . . . . .			85 . . . . .
Gardner Co . . . . .	420 . . . . .				
Vigil & Cleaves . . . . .	355 . . . . .	4 . . . . .		4 . . . . .	114 . . . . .
Hamlett . . . . .	230 . . . . .	16 . . . . .		55 . . . . .	45 . . . . .
J. D. Patterson . . . . .	40 . . . . .	15 . . . . .			
Meadow No. 2 . . . . .	55 . . . . .	10 . . . . .		35 . . . . .	
Roy . . . . .	63 . . . . .			9 . . . . .	20 . . . . .
Chavez . . . . .	160 . . . . .			3 . . . . .	35 . . . . .
Moeler . . . . .	3 . . . . .				3 . . . . .
Snow . . . . .	120 . . . . .			10 . . . . .	17 . . . . .
Emmerson . . . . .	25 . . . . .				25 . . . . .
Watkins . . . . .	100 . . . . .				10 . . . . .
Brooks Creek . . . . .	80 . . . . .			20 . . . . .	
Meadow . . . . .	80 . . . . .			60 . . . . .	
McHarg . . . . .	60 . . . . .				20 . . . . .
Hornback . . . . .	80 . . . . .		8 . . . . .		15 . . . . .
Murray . . . . .	35 . . . . .		5 . . . . .		30 . . . . .
R. M. Lincoln No. 1 . . . . .	25 . . . . .				10 . . . . .
R. M. Lincoln No. 2 . . . . .	40 . . . . .				25 . . . . .
R. M. Lincoln No. 3 . . . . .	12 . . . . .				10 . . . . .
McClure . . . . .	15 . . . . .				
Bradford & Swire . . . . .	100 . . . . .	2 . . . . .	2 . . . . .	10 . . . . .	55 . . . . .
Joe Murray . . . . .	300 . . . . .			40 . . . . .	
Glade . . . . .	160 . . . . .			8 . . . . .	16 . . . . .
Road . . . . .	40 . . . . .				8 . . . . .
Muddy Creek . . . . .	120 . . . . .	4 . . . . .		30 . . . . .	10 . . . . .
Robinson . . . . .	200 . . . . .			20 . . . . .	53 . . . . .
Honser . . . . .	160 . . . . .			30 . . . . .	35 . . . . .
Quillian No. 1 . . . . .	40 . . . . .	6 . . . . .			

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irriga- ted therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irrigated therefrom.
Quillian No. 2 . . . . .	30	4			10
Quillian No. 3 . . . . .	8	4	4		
Quillian No. 4 . . . . .	8	1			4
Wilburn No. 1 . . . . .	60	4		8	20
Wilburn No. 2 . . . . .	40				
Wilburn No. 3 . . . . .	5			3	
Owens . . . . .	25	4		8	2
W. T. Frink . . . . .	50			30	
Fernandez . . . . .	220	15	10		65
West Side . . . . .	40			25	
West Fork No. 1 . . . . .	210	8		50	
West Fork No. 2 . . . . .	30			10	
Meas No. 1 . . . . .	4				4
Meas No. 2 . . . . .	8			4	2
J. D. Ortobeas No. 1 . . . . .					4 <sup>1</sup> / <sub>2</sub>
J. D. Ortobeas No. 2 . . . . .	13			3	10
Martine No. 1 . . . . .					5
Martine No. 2 . . . . .					5
Riell . . . . .	80			11	4
Manwell Ortobeas . . . . .	80				6
David Chavez . . . . .	20				6
Aut Quintano . . . . .	160				117.2
The Harms . . . . .	600	12	3	8	118
The Garcia . . . . .	273	5		15	165
St. Stephen . . . . .	50				4
Pioneer . . . . .	120	4	35		20
Martine . . . . .	364	8			164
J. M. Jaques . . . . .	120	4			11
Pino . . . . .	180	4		15	133
Marline No. 1 . . . . .	230	25			26
The Craig . . . . .	130	20		28	62



NAME OF DITCH	No. of acres that can be irrigated therefrom.	No. of acres of alfalfa irrigated therefrom.	No. of acres of seeded grasses, other than alfalfa, irrigated therefrom.	No. of acres of natural grasses irrigated therefrom.	No. of acres of other crops irrigated therefrom.
St. Mary's . . . . .	25 . . . . .				11
Mahan . . . . .	180 . . . . .	12 . . . . .		23 . . . . .	10
J. W. Brown . . . . .	320 . . . . .	54 . . . . .		26 . . . . .	58
Z. Allen . . . . .	100 . . . . .				
St. Verine . . . . .	180 . . . . .	6 . . . . .		10 . . . . .	42
Gomez . . . . .	295 . . . . .	3 . . . . .		6 . . . . .	15
Proffitt . . . . .	9 . . . . .				9
Butte Valley . . . . .	720 . . . . .	165 . . . . .		80 . . . . .	40
Rice . . . . .	160 . . . . .	56 . . . . .	4 . . . . .	5 . . . . .	21
Moore . . . . .	45 . . . . .	21 . . . . .			
Madrill . . . . .	160 . . . . .				4
Meases & Co . . . . .	180 . . . . .			3 . . . . .	14
Burns . . . . .	600 . . . . .				
Sanders . . . . .	15 . . . . .				12
Karl . . . . .	4 . . . . .				4
Caldwell . . . . .	30 . . . . .			25 . . . . .	
Gunlett . . . . .	100 . . . . .	4 . . . . .		4 . . . . .	15
Spring . . . . .	30 . . . . .				5
R. D. Caldwell . . . . .	70 . . . . .			44 . . . . .	8
Candelario . . . . .	4 . . . . .				4
Hoffman . . . . .	50 . . . . .			1 . . . . .	20
Archuleta No. 1 . . . . .	80 . . . . .				
Garcia . . . . .	24 . . . . .				4
Montoya . . . . .	45 . . . . .				4
Navaujo . . . . .	200 . . . . .			35 . . . . .	28
Valdes No. 1 . . . . .	18 . . . . .				8
Nolasco . . . . .	10 . . . . .				7
Baker No. 1 . . . . .	35 . . . . .			25 . . . . .	10
Baker No. 2 . . . . .	100 . . . . .			28 . . . . .	22
Baker No. 3 . . . . .					
Spider Web No. 1 . . . . .	300 . . . . .				

NAME OF DITCH.	No. of acres that can be irrigated therefrom.	No. of acres of alfalfa irrigated therefrom.	No. of acres of seeded grasses, other than alfalfa, irrigated therefrom.	No. of acres of natural grasses irrigated therefrom.	No. of acres of other crops irrigated therefrom.
Spider Web No. 2 . . . . .	140 . . . . .			70 . . . . .	30 . . . . .
Petty No. 1 . . . . .	80 . . . . .			10 . . . . .	20 . . . . .
Petty No. 2 . . . . .	40 . . . . .			10 . . . . .	40 . . . . .
Cisneros No. 1 . . . . .	100 . . . . .				5 . . . . .
Cisneros No. 2 . . . . .	30 . . . . .			4 . . . . .	4 . . . . .
J. H. Craig . . . . .	50 . . . . .	Has not	worked	ranch	this year.
Elina Baca . . . . .	45 . . . . .				5 . . . . .
Ojo . . . . .	50 . . . . .				34 . . . . .
Meas creek . . . . .	270 . . . . .				23 . . . . .
Valdes No. 2 . . . . .	85 . . . . .				14 . . . . .
Valdes No. 3 . . . . .	10 . . . . .				10 . . . . .
Romerez . . . . .	25 . . . . .				4 . . . . .
Romerez No. 2 . . . . .	3 . . . . .				1 . . . . .
Dolores Garcia . . . . .	10 . . . . .				8 . . . . .
Apadaca No. 1 . . . . .	40 . . . . .				26 . . . . .
Apadaca No. 2 . . . . .	25 . . . . .				2 . . . . .
Flora Montez No. 1 . . . . .	30 . . . . .				30 . . . . .
Flora Montez No. 2 . . . . .	15 . . . . .	5 . . . . .			1 . . . . .
J. M. Montez . . . . .	80 . . . . .				18 . . . . .
Quintana . . . . .	10 . . . . .				4 . . . . .
Montana . . . . .	5 . . . . .				3 . . . . .
Castora . . . . .	5 . . . . .				3 . . . . .
Turkey Creek . . . . .	15 . . . . .				12 . . . . .
Victor Montoya No. 1 . . . . .	5 . . . . .				4 . . . . .
L. A. Harms . . . . .	40 . . . . .			10 . . . . .	20 . . . . .
Vegil . . . . .	100 . . . . .	10 . . . . .			20 . . . . .
Fran Martine . . . . .	8 . . . . .				6 . . . . .
Victor Montoya No. 2 . . . . .	5 . . . . .				2 . . . . .
M. Archuleta . . . . .	40 . . . . .				
Ramon Trujilla . . . . .	4 . . . . .				4 . . . . .
Ma Ant Sanchez . . . . .	5 . . . . .				3 . . . . .

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses oth- er than alfalfa irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irri- gated therefrom.
Augusto Labata . . . . .	15			2	4
Martine & Sons No. 1 . . . . .	20				4
Martine & Sons No. 2 . . . . .	20				
Nunda . . . . .	20		1	2	12
Rock Wall No. 1 . . . . .	60		12	2	5
Rock Wall No. 2 . . . . .	10				
R. W. Willis No. 1 . . . . .	60		25		
Carpenter . . . . .	50		20		17
J. W. Smith No. 1 . . . . .	10				
John G. Cozad No. 1 . . . . .					23
John G. Cozad No. 2 . . . . .			19	8	3
Cuchara . . . . .	100	4	10	20	16
Julius G. Kruger . . . . .	60	20	10	10	10
Bruce No. 1 . . . . .	90		20	20	16
Bruce No. 2 . . . . .	10				5
George Kitchens . . . . .	25				3
Butte . . . . .	830		3		62
Philip S. Side . . . . .	85		10	8	10
Patterson . . . . .	480	32			83
Patterson Extension . . . . .	345	40	22		25
Montey . . . . .	25		7	8	
Edmonds . . . . .	25				
Ward & Edmonds . . . . .	76		5	8	30
Francisco & Daigre . . . . .	820	27	50	485	75
La Veta Mill . . . . .	No water used in 1888 Capacity not known				
La Veta Town . . . . .	Carries water continuously. Nothing further known				
Calf Pasture . . . . .	150	16	68	45	6
B. F. Palmer . . . . .	Used as an auxiliary to the Calf Pasture				
T. L. Martin No. 2 . . . . .	31			1	5
Nathe Patterson . . . . .	50	25		15	
Moore . . . . .	Used as an auxiliary to the N. Patterson				

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses oth- er than alfalfa irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irri- gated therefrom.
L. D. R. D. . . . .	50 . . . . .	12 . . . . .		8 . . . . .	6 . . . . .
Denton . . . . .	45 . . . . .			12 . . . . .	13 . . . . .
John Brown . . . . .	145 . . . . .		8 . . . . .	61 . . . . .	44 . . . . .
Sefton H. T. No. 1 . . . .	Not known . . . . .	15 . . . . .		5 . . . . .	15 . . . . .
Sefton H. T. No. 2 . . . .	Not known . . . . .	5 . . . . .		3 . . . . .	
Sefton H. T. No. 3 . . . .	Not known . . . . .				10 . . . . .
Sefton H. T. No. 4 . . . .	Not known . . . . .	4 . . . . .			4 . . . . .
South Veta Highland . . .	400 . . . . .	10 . . . . .			5 . . . . .
Alexander & Kincade . . .	85 . . . . .			70 . . . . .	3 . . . . .
Alexander & Barnard . . .	92 . . . . .	15 . . . . .		50 . . . . .	12 . . . . .
Sandoval, south . . . . .	180 . . . . .				14 . . . . .
Sandoval, north . . . . .	105 . . . . .	20 . . . . .		36 . . . . .	24 . . . . .
H. B. Sager . . . . .	50 . . . . .	4 . . . . .		30 . . . . .	4 . . . . .
Highland . . . . .	120 . . . . .	15 . . . . .		15 . . . . .	13 . . . . .
Ute . . . . .	10 . . . . .				8 . . . . .
Indian Creek . . . . .	15 . . . . .				6 . . . . .
Hardy & Barnard . . . . .	60 . . . . .	2 . . . . .			7 . . . . .
J. Y. Owenby . . . . .	12 . . . . .				
Owenby Bros . . . . .	35 . . . . .	15 . . . . .			6 . . . . .
F. M. Owenby . . . . .	50 . . . . .	5 . . . . .		15 . . . . .	25 . . . . .
Fain & Martin . . . . .	40 . . . . .			6 . . . . .	4 . . . . .
Saller No. 1 . . . . .	17 . . . . .		6 . . . . .		3 . . . . .
Saller No. 2 . . . . .					
McDonald No. 1 . . . . .	40 . . . . .	7 . . . . .			7 . . . . .
McDonald No. 2 . . . . .	10 . . . . .		10 . . . . .		
Stapeland . . . . .	160 . . . . .		4 . . . . .		20 . . . . .
J. E. Parks . . . . .	30 . . . . .			5 . . . . .	7 . . . . .
Carver . . . . .	40 . . . . .		20 . . . . .		10 . . . . .
<u>Z</u> . . . . .	200 . . . . .	10 . . . . .	10 . . . . .	30 . . . . .	45 . . . . .
Smith-Crumley . . . . .	35 . . . . .			8 . . . . .	12 . . . . .
David Heart . . . . .	30 . . . . .	24 . . . . .	3 . . . . .		

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irrigat- ed therefrom.
Gribble & Baker . . . . .	135				2
Gribble No. 1 . . . . .	50			15	19
Z. Gribble . . . . .	40			4	16
Plaza . . . . .	200			6	29
Wayman . . . . .	195		4	55	22
McOlive & Denton . . . . .	300	25		20	12
Spanish Peaks Co. . . . .		62	157	60	76
Beaver Dam . . . . .	120	5		35	25
Walsen No. 1 . . . . .	200	17		50	10
Walsen No. 2 . . . . .	120			10	67
Trujilla . . . . .	135			10	46
Romerez No. 1 . . . . .	152			29	41
Theo. Meas . . . . .	5				
Vigil Bros . . . . .	115				3
Juan Pachaco . . . . .	10				6
Bear . . . . .	250				57
Walsenburg Town . . . . .		27½			27½
Gomez No. 1 . . . . .	230	2			73
Jean George . . . . .	120	20		47	6
Madrill No. 1 . . . . .	201				50
Madrill No. 2 . . . . .	50			16	6
Mexican . . . . .	500	7		6	78
Lake Merriam . . . . .		100		123	57
Sanchez No. 3 . . . . .	200	3			13
Plaza . . . . .	992	108½		7½	13
Aut Sanctez . . . . .	40				
Leonitus Valdes . . . . .	100				
Marbutt . . . . .	300				18
Kincade No. 1 . . . . .	50			50	
Kincade No. 2 . . . . .	8				7
Walsen Veta . . . . .		20		180	80



NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfa lfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irrigat- ed therefrom.
Clemente Trujilla . . . . .	4 . . . . .				
Vigil . . . . .	170 . . . . .	2 . . . . .	30 . . . . .	30 . . . . .	46 . . . . .
Luis Gonzollez . . . . .	60 . . . . .			10 . . . . .	10 . . . . .
Price Mertus Haldy . . . . .	320 . . . . .	50 . . . . .			10 . . . . .
Labata . . . . .	100 . . . . .	65 . . . . .			15 . . . . .
Simons . . . . .	0 . . . . .			30 . . . . .	
Jas. Lam . . . . .					
Chas. Lam . . . . .	40 . . . . .	3 . . . . .	12 . . . . .	20 . . . . .	8 . . . . .
Foristine . . . . .	200 . . . . .		25 . . . . .		45 . . . . .
Collum . . . . .	45 . . . . .		30 . . . . .		3 . . . . .
Sam'l J. Capps . . . . .	50 . . . . .		15 . . . . .		15 . . . . .
Hickland . . . . .	200 . . . . .	75 . . . . .	75 . . . . .		12 . . . . .
Kinsey . . . . .	125 . . . . .	15 . . . . .			12 . . . . .
Graham . . . . .					
D. K. L. M C. & K . . . . .	63 . . . . .	5 . . . . .			20 . . . . .
Cavinnis . . . . .	100 . . . . .				25 . . . . .
L. Hickland . . . . .	200 . . . . .				
A. J. Dodgins . . . . .	200 . . . . .			80 . . . . .	
Jas. Patterson . . . . .	300 . . . . .	16 . . . . .		200 . . . . .	20 . . . . .
Whitman & Mott . . . . .	200 . . . . .	40 . . . . .		75 . . . . .	
Palmer No. 2 . . . . .	40 . . . . .				
Shields . . . . .	80 . . . . .			6 . . . . .	10 . . . . .

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 16,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
*D. K. L. M. & P. ditch and branches	Apache creek	Jan. 30, 1888	Nov. 2, 1887	13.00	Juan Medill et al
Montez ditch	Huerfano river	Mar. 29, 1888		33.615	Juan D. Montez et al
†Montez ditch, enlargement	Huerfano river	Mar. 29, 1888	Jan. 2, 1888	31.64	Juan D. Montez et al
‡Huerfano Valley ditch	Huerfano river	April 30, 1888	Feb. 2, 1888		The Huerfano Valley Ditch & Reser- voir Co., Thos. B. Aldridge, Pres't.
§Mesa ditch	Huerfano river	June 14, 1888		13.96	A. S. McIntire et al
Madrid ditch	Cucharas river	July 2, 1888	Mar. —, 1884	20.90	Rosa Gomez et al
¶La Joya ditch	{ Cucharas river } { thro' Gomez ditch }	July 2, 1888	April 10, 1888	25.98	John F. Read
The Mill ditch	Huerfano river	Sept. 12, 1888	Sept. —, 1887	43.04	J. B. Hudson
Alto ditch	Huerfano river	Sept. 22, 1888	July 3, 1888	6.41	Milan D. Brown

\* The K. & M. reservoir is supplied from a branch of the main or D. K. L. M. & P. ditch

† Supplies the Montez reservoir.

‡ This ditch is said to be an enlargement and extension of the Kinsey ditch; capacity of ditch, as enlarged, 165.74 cubic feet.

§ Surveyed March 15, 1888.

¶ This ditch draws water directly from the Gomez ditch.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 16,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
K. & M. reservoir . . .	Apache creek	D.K. L.M. & P. ditch & branch	Jan. 30, 1888	Nov. 2, 1887	1,667,283	John Medill et al.
Montez reservoir . . .	Huerfano riv.	Montez ditch	Mar. 29, 1888	Jan. 2, 1888	251,410	Juan D. Montez et al.
The Huerfano Val. Dch. & Reservoir Co.'s res.	Huerfano riv.	Huerfano Val- ley ditch	April 30, 1888	Jan. 2, 1888	87,855,600	{ The Huerfano Valley Ditch & Reservoir Co., Thos. B. Aldridge, Pres.
La Joya reservoir . . .	Cucharas riv.	La Joya & Co- mez ditches.	July 2, 1888	April 10, 1888	7,741,400	John F. Read

## WATER DISTRICT No. 17.

No water commissioner has been appointed for this district.

Water District No. 17 consists of all lands irrigated from ditches or canals taking water from that part of the Arkansas river lying in Bent county; also, all lands irrigated from ditches or canals taking water from the tributaries of the said portion of the Arkansas river, except the Apishapa and its tributaries, and the Purgatoire ditch and its tributaries.

Earnest efforts were made to induce the county commissioners of Bent county to recommend a suitable man, to be appointed by the Governor, as water commissioner of this district, to the end that some knowledge of this important district might be obtained from the reports of the water commissioner who might be so appointed. These efforts were not successful.

There is in this district a conflict between the interests of the irrigators and those of the cattle-raisers, which is retarding the progress of irrigation development in this portion of the Arkansas valley.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 17,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER, PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
South Side ditch . . . . .	Arkansas riv.	Feb. 27, 1888	Dec. 5, 1887	80.00	Robt. J. Goldacker, President
Seven Bar ditch . . . . .	Caddoa creek	April 9, 1888	Feb. 1, 1888	32.00	G. M. Woodworth
*The Maryland ditch . . . . .	Lit. Horse cr. and sp'gs	June 16, 1888	April 10, 1888	4.00	The Maryland Land and Cattle Co., W. B. Gaskill, Secretary.
†Hugo Ditch and Pipe Line . . . . .	Big Sandy cr. and trib's.	July 5, 1888	June 29, 1888	4.50	A. K. Clarke
‡The Thurlow Land and Live Stock Co.'s West ditch.	Steele's Fork	July 16, 1888	May 3, 1888		The Thurlow Land and Live Stock Co., by Charles Thurlow.
‡The Thurlow Land and Live Stock Co.'s East ditch.	Steele's Fork	July 16, 1888			The Thurlow Land and Live Stock Co., by Charles Thurlow.

\*This ditch is connected with six reservoirs, designated as the Maryland Land & Cattle Co.'s reservoirs, in this report.

†Small reservoirs are connected with this ditch and pipe line.

‡There are ten reservoirs connected with these ditches.



## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 17,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER, PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
Seven Bar Reservoir "A"	Caddoa creek		April 9, 1888		720,000	G. M. Woodworth
Seven Bar Reservoir "B"	Caddoa creek	Seven Bar ditch	April 9, 1888		540,000	G. M. Woodworth
The Maryland Land and Cattle Company's Res- ervoir No. 1 . . . .	Little Horse creek and springs . . . .		June 16, 1888		24,348.7	{ The Maryland Land and Cattle Com- pany, W. B. Gaskill, Secretary.
" " No. 2	" "	" "	" "	" "	407,109.7	" "
" " No. 3	" "	" "	" "	" "	451,591.7	" "
" " No. 4	" "	" "	" "	" "	86,351.7	" "
" " No. 5	" "	" "	" "	" "	30,817.5	" "
" " No. 6	" "	" "	" "	" "	245,565.5	" "
The Thurlow Land and Live Stock Company's Reservoir "A" . . . .	Steele's Fork, tributaries thereof and springs . . . .		" "	" "	360,000	{ The Thurlow Land and Live Stock Company, by Charles Thurlow.
" " "B"	" "	" "	" "	" "	390,000	" "
" " "C"	" "	" "	" "	" "	350,000	" "
" " "D"	" "	" "	" "	" "	5,425,000	" "
" " "E"	" "	East ditch	" "	" "	2,760,720	" "

Symbol	Value	Unit
"P"	585,000	585,000
"G"	585,000	585,000
"N"	262,500	262,500
"O"	210,000	210,000
"p"	90,000	90,000

## WATER DISTRICT No. 18.

*Water District No. 18—W. H. Schulze, Water Commissioner.* Appointed April 7, 1887. Address, Apishapa, Las Animas county, Colorado.

Water District No. 18 consists of all lands irrigated from ditches or canals taking water from the Apishapa and its tributaries.

No report has been received from the water commissioner of this district.

## WATER DISTRICT No. 19.

*Water District No. 19—*No water commissioner has been appointed for this district.

Water District No. 19 consists of all lands irrigated from ditches or canals taking water from the Purgatoire and its tributaries.

No recommendations for the appointment of a water commissioner for this district have been made to the Governor.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 19,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Jeannin San Francisco ditch . . . . .	{ S. Francisco creek.	July 9, 1888	April 15, 1888	10.00	. . . . . Gustave Jeannin
San Francisco ditch No. 1. . . . .	{ S. Francisco creek.	July 14, 1888	April 14, 1888	24.00	. . . . . Albert W. Archibald
San Francisco ditch No. 2. . . . .	{ S. Francisco creek.	July 14, 1888	April 14, 1888	24.00	. . . . . Albert W. Archibald
San Francisco ditch No. 3. . . . .	{ S. Francisco creek.	July 14, 1888	April 14, 1888	28.00	. . . . . Albert W. Archibald
*San Geidra ditch No. 1. . . . .	{ S. Francisco creek.	Aug. 22, 1888	. . . . .	9.40	Frank L. Jeannin, Elwood M. Garrison

\*This ditch is claimed to have been originally constructed in May, 1885, and extended in May, 1888.

## MISCELLANEOUS.

STATEMENT CONCERNING DITCHES IN WATER DIVISION No. 2, BUT IN NO WATER DISTRICT, RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
*Howard & Walsh ditch . . . . .	{ Tennessee river, Ogden gulch and Spring gulch. }	Aug. 30, 1888		75.50	Thomas G. Howard Patrick Walsh

\*First appropriation made in 1880, from Tennessee river and Spring gulch. Enlargement, June 11, 1888. Total capacity, ———.



## CHAPTER IV.

## WATER DIVISION NO. 3.

*Water Division No. 3, Rio Grande Division.*—Thomas McCunniff was appointed Superintendent of Irrigation of Water Division No. 3, August 22, 1887, and resigned May 12, 1888.

Jervis J. Chapman was appointed Superintendent of Irrigation of Water Division No. 3, June 15, 1888. Address, Alamosa.

Water Division No. 3 includes all water districts consisting of lands watered from the Rio Grande river and its tributaries, and is named the Rio Grande division.

This water division embraces water districts numbered 20, 21, 22, 24, 25, 26, 27 and 35.

Mr. Chapman reported, August 9, 1888, that the La Jara and Alamosa rivers, in District No. 21, were carrying but little water, only about one-half of the amount needed for irrigation; that the Conejos river, in District No. 22, was carrying about four-fifths of the quantity of water needed; that the Rio Grande, in District No. 20, was carrying about three-fourths of what was needed; that District No. 27 had been without water since the first of July; that Water District No. 26 had had no water since July 1, except what was received from the *Del Norte and Saguache canal*, taking water from the Rio Grande.

## WATER DISTRICT No. 20.

*Water District No. 20, C. W. Givens, Water Commissioner.* Appointed June 15, 1888. Residence, Alamosa, Colorado.

Water District No. 20 consists of all lands within the State of Colorado irrigated from ditches or canals taking water from the Rio Grande river within said State.

None of the tributaries of the Rio Grande are included in the description of Water District No. 20, though it would seem, from the fact that the creation of this district, April 2, 1887, was prefaced by the statement that "water districts numbered twenty and twenty-three of the State of Colorado, as heretofore established, be and the same are hereby consolidated and formed into one water district, numbered twenty, of the State of Colorado," and from the fact that water districts numbered twenty and twenty-three, theretofore established, did embrace certain small tributaries of the Rio Grande, that it was the intention of the framers of the bill creating the new water district, No. 20, to include the tributaries of the Rio Grande previously embraced in the water districts consolidated. This has occasioned some misunderstandings. Some of the statements following may embrace particulars concerning ditches that do not, under a strict interpretation of the description of the district, belong therein. Ditches believed by the owners to be in Water District No. 20 may be found described under the head of Miscellaneous Ditches at the close of this chapter.

Mr. Givens reports for the year 1888, among other things, the following particulars concerning the ditches and the use made of water in his district:

## WATER DISTRICT NO. 20.

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STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 20.  
BY THE WATER COMMISSIONER

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Star . . . . .	5	1,240	20	100	640	210
Rio Grande and S. Luis	12	2,000	10		1,200	240
Baur . . . . .	1½	160		40	40	80
Rushford . . . . .	1	320	15	30	210	45
Newton . . . . .	3	320			240	80
Park & Green. . . . .		320		40	160	40
Citizens . . . . .	22	10,000			2,000	5,000
Midland. . . . .		19,200			Not completed	
North Star . . . . .		18,000			Not completed	
Murrey . . . . .	½	320			40	40
Cole No. 1 . . . . .		80			80	
Cole No. 2 . . . . .		160		25	80	55
Larick No. 1. . . . .		160	20	15	80	25
Larick No. 2. . . . .		80			80	
Bohn . . . . .	3	160			80	40
Clover Leaf . . . . .	1½	160			120	40
William Peachy . . . . .	1	160			90	50
Kane & Caller. . . . .	3	320		40	160	80
Empire . . . . .	60 <sup>a</sup>	40,000	160	80	10,000	7,000
Off. . . . .	9¾	320	10	30	180	45
Swartz . . . . .	1	160			160	
Henry Blackmer . . . . .	2	900	15	60	800	25
Loma & La Graste . . . . .	12	6,000	180	90	5,000	400
Meadow . . . . .	½	320			300	20
Billings . . . . .		640	60	25	200	190
Bueno, D. . . . .	8	2,000			1,000	
Eagle . . . . .	¾	280	20	60	180	40
Larnet . . . . .	15	6,000	100		200	3,000
Farmers' Mutual . . . . .		50,000			Not completed	

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Centennial . . . . .	28	25,000	100	300	19,000	1,700
Sweed . . . . .	3½	940	80	180	260	420
Horner . . . . .	3½	400	60	35	190	110
Del Norte and Saguache	70	200,000	40	200	20,000	7,000
Wilkins . . . . .	6	6,000			6,000	
C. W. Givens . . . . .	3	320			300	20
Worcester . . . . .	7	1,280			1,000	
C. Ottway . . . . .		240			200	40
Backus . . . . .	3	640			500	
Johanson . . . . .	4	320			160	80
Lee . . . . .	4	400			320	40
Miller . . . . .	4	320			300	20
Craig . . . . .	5	160			100	60
Madusx . . . . .	5	400			400	
Rocker . . . . .		160			100	

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 20,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Fish ditch . . . . .	Rio Grande . . . . .	Sept. 27, 1887	April 1, 1874	53.00	Harry Frauecklin
Sierra Blanca canal . . . . .	Rio Grande . . . . .	Oct. 18, 1887	July 19, 1887	345.60	{ Sierra Blanca Canal Co., Richard Day, president.
North High Line ditch . . . . .	Rio Grande . . . . .	Nov. 28, 1887	Aug. 27, 1887	215.00	{ The North High Line Ditch Co., Ioni Weiss, president.
Midland ditch . . . . .	Rio Grande . . . . .	Dec. 5, 1887	Aug. 31, 1887	290.00	{ Midland Ditch Co., R. C. Nisbet, pres.
*Rio Grande and San Luis ditch . . . . .	Arroya . . . . .	Dec. 30, 1887	April 1, 1881	85.00	{ Rio Grande and San Luis Ditch Co., H. W. Gilchrist, president.
North Star ditch . . . . .	Rio Grande . . . . .	Jan. 6, 1888	Oct. 5, 1887	670.00	{ The North Star Land and Canal Co., J. H. Mercer, vice president.
The South Side High Line ditch . . . . .	Rio Grande . . . . .	Jan. 21, 1888	Oct. 25, 1887	199.00	{ The South Side High Line Ditch Co., by Geo. D. Nickel.
The Farmers' Union ditch . . . . .	Rio Grande . . . . .	Jan. 27, 1888	Nov. 9, 1887	804.00	{ The Farmers' Union Ditch Co., Geo. A. Dudley, president.
Alta canal . . . . .	Rio Grande . . . . .	Feb. 29, 1888	Nov. 30, 1887	1040.00	{ The Alta Canal, Land and Town Co., Wm. P. Allen and F. G. Blake.
†Fish Extension ditch . . . . .	Rio Grande . . . . .	Mar. 19, 1888	. . . . .	45.00	. . . . . Henry Blackmore
‡Loma & LaGarita ditch . . . . .	Rio Grande . . . . .	April 17, 1888	. . . . .	98.00	{ The Loma & La Garita Ditch Co., by Rueben Dunning.
Farmer's Union ditch . . . . .	Rio Grande . . . . .	May 8, 1888	Nov. 9, 1887	1300.00	{ The Farmers' Union Ditch Co., Geo. A. Dudley, president.
§Bauer ditch . . . . .	Rio Grande . . . . .	May 11, 1888	. . . . .	52.00	. . . . . John G. Bauer
Original Kane & Callan ditch . . . . .	Rio Grande . . . . .	June 12, 1888	. . . . .	18.00	. . . . . Frederick Fuller et al
The Hickory Jackson ditch . . . . .	Rio Grande . . . . .	June 13, 1888	Mar. 15, 1888	120.00	{ The Hickory Jackson Ditch Co., Oscar Wilkins, pres., W. H. Adams, sec.



STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 20—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second	NAME OF CLAIMANT
Off ditch	Rio Grande	July 2, 1888		28.00	John Off, Joseph Bachle
††Park & Green ditch	Rio Grande	July 3, 1888		9.00	W. S. Park, Chas. Green
††The Rio Grande and Lariat ditch	{ Arroya flowing } { from Rio Grande }	July 26, 1888		72.00	W. H. Marsh et al
Feeder No. 1 to the San Luis canal	Rio Grande	July 30, 1888	April 30, 1888	3000.00	{ The San Luis Land, Canal & Improve- ment Co., E. L. Jones, gen. supt }
Feeder No. 2 to the San Luis canal	Rio Grande	July 30, 1888	April 30, 1888	3000.00	{ The San Luis Land, Canal & Improve- ment Co., E. L. Jones, gen. supt }
‡‡The Empire canal	{ Slough of the } { Rio Grande }	Aug. 7, 1888	July 29, 1882	2296.70	{ The Empire Land & Canal Co., I. C. Henry, president }
‡‡‡The Starr ditch	Rio Grande	Sept. 7, 1888			Hiram A. Butterfield, John F. Anderson
¶¶Ben Ogle ditch	{ An arroya of the } { Rio Grande }	Oct. 6, 1888		18.00	..... H. G. Henderson et al
Enlargement and extension of the Minor ditch	Rio Grande	Oct. 15, 1888		48.00	..... Theophile Benjoosky et al
†††Enlargement and extension of the Minor ditch	Rio Grande	Oct. 15, 1888		48.00	..... Theophile Benjoosky et al
The San Luis canal	Rio Grande	Oct. 22, 1888	Sept. 21, 1888	1500.00	{ Theophile Benjoosky et al }
Lateral No. 1	{ Rio Grande thro' } { San Luis canal }	Oct. 22, 1888	Sept. 11, 1883	98.80	{ The San Luis Land, Canal & Improve- ment Co., Thos. P. Dunbar, pres. }
Lateral No. 2	{ Rio Grande thro' } { San Luis canal }	Oct. 22, 1888	Dec. 21, 1887	433.78	{ The San Luis Land, Canal & Improve- ment Co., Thos. P. Dunbar, pres. }
Lateral No. 3	{ Rio Grande thro' } { San Luis canal }	Oct. 22, 1888	Sept. 11, 1883	About 1999.20	{ The San Luis Land, Canal & Improve- ment Co., Thos. P. Dunbar, pres. }
Feeder No. 1 to the San Luis canal	Rio Grande	Oct. 22, 1888	April 30, 1888	3000.00	{ The San Luis Land, Canal & Improve- ment Co., Thos. P. Dunbar, pres. }
Feeder No. 2 to the San Luis canal	Rio Grande	Oct. 22, 1888	April 30, 1888	3000.00	{ The San Luis Land, Canal & Improve- ment Co., Thos. P. Dunbar, pres. }

†††The Spring Ranch ditch . . . . .	Rio Grande . . . . .	Oct. 31, 1888							Arthur K. Patten, Geo. Bainbridge
Kentworth canal . . . . .	Rio Grande . . . . .	Nov. 28, 1888	July 3, 1888	786.00					The Kentworth Canal Co., S. C. Moore, Secretary.

\*What is called an arroyo appears to be an arm of the Rio Grande.

†Water claimed to have been appropriated by original construction, April 15, 1881.

‡Water claimed to have been appropriated by original construction, February 11, 1888.

§Water claimed to have been appropriated by original construction, June 1, 1880.

||Water claimed to have been appropriated by original construction, June 1, 1874.

¶Water claimed to have been appropriated by original construction, May 1, 1875.

††Water claimed to have been appropriated by original construction, May 1, 1880.

‡‡Probably draws water from a slough of the Rio Grande; surveys made October 10, 1881; construction commenced October 18, 1881.

§§This is said to be an enlargement of the Leese, Davis & Bingle ditch, which had a capacity of 36.40 cubic feet per second; the present capacity of the Empire canal is 2333.10 cubic feet per second.

|||Water claimed to have been appropriated by original construction, August 20, 1879; capacity claimed to be 1700 statutory inches.

¶¶Water claimed to have been appropriated by original construction, April 1, 1878, to the amount of 40 cubic feet per second, and by an enlargement to the amount of 8 cubic feet per second.

†††Water claimed to have been appropriated by original construction, April 1, 1878, to the amount of 40 cubic feet per second. Total capacity claimed, 88 cubic feet per second.

††††Water claimed to have been appropriated by original construction, April 20, 1888.

## WATER DISTRICT No. 21.

*Water District No. 21, Flavio A. Garcia, Water Commissioner.* Appointed September 26, 1887. Address, La Jara, Colorado.

Water District No. 21, consists of all lands irrigated from ditches or canals taking water from the Alamosa and La Jara creeks, and their tributaries.

Mr. Garcia reports the following particulars for the year 1888, concerning the ditches and the use made of water in Water District No. 21.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 21,  
BY THE WATER COMMISSIONER.

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irri- gated therefrom.	Number of acres of natural grasses ir- rigated therefrom.	Number of acres of other crops irriga- ted therefrom.
Rivera . . . . .	967 . . . . .			792 . . . . .	175
Gartins Gallegos . . . . .	660 . . . . .			530 . . . . .	130
Lemita No. 1 . . . . .	80 . . . . .			30 . . . . .	50
Lemita No. 2 . . . . .	80 . . . . .			40 . . . . .	40
Valdez . . . . .	1,800 . . . . .			1,555 . . . . .	245
Lemita No. 3 . . . . .	100 . . . . .			40 . . . . .	60
Garcia No. 2 . . . . .	160 . . . . .			80 . . . . .	80
Garcia No. 1 . . . . .	80 . . . . .			20 . . . . .	60
Ramona . . . . .	231 . . . . .			45 . . . . .	186
Biego . . . . .	640 . . . . .			410 . . . . .	230
Madril . . . . .	480 . . . . .			380 . . . . .	100
Pino Real . . . . .	120 . . . . .			60 . . . . .	60
Savco . . . . .	390 . . . . .			190 . . . . .	200
Juande Dios Vigil . . . . .	82 . . . . .			12 . . . . .	70
Agua Caliente . . . . .	358 . . . . .			228 . . . . .	130
Galegos No. 3 . . . . .	560 . . . . .			400 . . . . .	160
Norland ditch . . . . .	1,200 . . . . .	10 . . . . .		1,160 . . . . .	30
Romero ditch . . . . .	320 . . . . .			240 . . . . .	80
Davis & Chapman . . . . .	1,120 . . . . .	12 . . . . .		1,028 . . . . .	80

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, oth- er than alfalfa, irri- gated therefrom.	Number of acres of natural grasses irri- gated therefrom.	Number of acres of other crops irri- gated therefrom.
San Jose, No. 2 . . . . .	46 . . . . .			31 . . . . .	15
San Jose, No. 1 . . . . .	170 . . . . .				170
Ronmaldo Valdez . . . . .	80 . . . . .			20 . . . . .	60
Jose A. Atencio . . . . .	40 . . . . .			26 . . . . .	14
Sanches, No. 1 . . . . .	90 . . . . .			85 . . . . .	5
Sanches, No. 2 . . . . .	10 . . . . .			10 . . . . .	
Gallegos, No. 4 . . . . .	205 . . . . .			178 . . . . .	27
Gallegos, No. 1 . . . . .	200 . . . . .			100 . . . . .	100
Gallegos, No. 2 . . . . .	90 . . . . .			20 . . . . .	70
Pisdra . . . . .	160 . . . . .			140 . . . . .	20
Walsh . . . . .	60 . . . . .			60 . . . . .	
Pamer . . . . .	170 . . . . .			150 . . . . .	20
Lovet . . . . .	130 . . . . .			120 . . . . .	10
Morganville . . . . .	1,760 . . . . .	10 . . . . .		1,470 . . . . .	380
Swamp . . . . .	320 . . . . .			320 . . . . .	
Hansen Overflow . . . . .	880 . . . . .			880 . . . . .	
Codington . . . . .	480 . . . . .			480 . . . . .	
Apelin . . . . .	640 . . . . .			510 . . . . .	130
McCuniffe & Ortiz . . . . .	920 . . . . .		70 . . . . .	645 . . . . .	205
Cristobol Ruebera . . . . .	240 . . . . .			140 . . . . .	100
Baker . . . . .	480 . . . . .			400 . . . . .	80
Newcomb Bros . . . . .	150 . . . . .		15 . . . . .	108 . . . . .	27
Ed. Newcomb . . . . .	1,000 . . . . .			750 . . . . .	250
Aroyo . . . . .	400 . . . . .			400 . . . . .	
Spring Creek . . . . .	320 . . . . .			320 . . . . .	
Skredge & Garret . . . . .	210 . . . . .			110 . . . . .	100
Cottonwood . . . . .	640 . . . . .	500 . . . . .		140 . . . . .	
Alamosa and Spring } Creek . . . . .	600 . . . . .			600 . . . . .	
North Alamosa . . . . .	1,160 . . . . .			1,060 . . . . .	100
Alamosa, No. 1 . . . . .	400 . . . . .			400 . . . . .	
Alamosa Canal . . . . .	12,000 . . . . .	120 . . . . .	300 . . . . .	600 . . . . .	692

NAME OF DITCH.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses oth- er than alfalfa irri- gated therefrom.	Number of acres of natural grasses ir- rigated therefrom.	Number of acres of other crops irri- gated therefrom.
Morganville . . . . .	1,760	10 . . .	40 . . .	100 . . .	310
Siona Vista . . . . .	2,200	40 . . .	70 . . .	1,280 . . .	340
Flintham . . . . .	960			480 . . .	160
Union . . . . .	2,780 .	15 . . .	15 . . .	1,815 . . .	587
Miller . . . . .	800 .			580 . . .	220
Wardsters . . . . .	480 .			480 . . .	
Scandinavian . . . . .	3,200 .			2,900 . . .	300
Head Overflow . . . . .	1,100 .			1,100 . . .	
Overflows, 1, 2 and 4 .	11,000 .			11,000 . . .	
Clarks . . . . .	160 .			160 . . .	



# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 21,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

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NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Alamosa Creek canal	Alamosa creek	Aug. 12, 1887		282.00	{ Alamosa Creek Canal Company, by Walker H. Graves, Engineer.
*The Baker ditch	Alamosa creek	Sept. 2, 1887		16.00	L. R. Baker, et al.
†The Coddington ditch	La Jara creek	Sept. 2, 1887		56.00	A. M. Coddington, et al.
‡Cottonwood ditch	Alamosa creek	Sept. 13, 1887	May 20, 1887	19.90	John Harvey, D. E. Newcomb
Scandinavian canal	Alamosa river	Sept. 19, 1887	Aug. 7, 1887	112.00	Anton Alsou, et al.
Miller Irrigating ditch	Alamosa river	Sept. 19, 1887	Nov. 11, 1886	83.00	Ernest G. Miller, et al.
The Nate Garrett ditch, enlargement	La Jara creek	Sept. 19, 1887	Aug. 12, 1887	4.00	J. C. Pursley
Melvin Irrigating ditch	Alamosa river	Sept. 20, 1887	Dec. 10, 1886	99.60	F. M. Knapp, et al.
Nate Garrett ditch	La Jara creek	Sept. 26, 1887	April 15, 1882	4.00	{ The La Jara Creamery and Live Stock Association, D. E. Newcomb, Mgr.
Union ditch, enlargement	Alamosa creek	Sept. 26, 1887	June 27, 1887	140.00	{ The La Jara Creamery and Live Stock Association, D. E. Newcomb, Mgr.
Lower La Jara ditch	La Jara creek	Sept. 26, 1887	May 1, 1882	72.00	{ The La Jara Creamery and Live Stock Association, D. E. Newcomb, Mgr.
Settler ditch	Alamosa river	Jan. 24, 1888	Oct. 26, 1887	70.00	J. C. Veeder, et al.
The Madril Irrigating ditch	Alamosa creek	Mar. 5, 1888		18.00	Julian Madril, et al.
*The Valdez ditch	Alamosa river	Mar. 5, 1888		14.00	José de Jesus Martinez
**The Valdez ditch, enlargement.	Alamosa river	Mar. 5, 1888		42.00	José de Jesus Martinez

WATER DISTRICT NO. 21.

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STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 2<sup>d</sup>—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Ribera ditch . . . . .	Alamosa river . . . . .	Mar. 5, 1888	June 11, 1885	30.00	Feliz Ribera
††The Hilario Irrigating ditch . . . . .	Alamosa creek . . . . .	Mar. 5, 1888		4.00	Hilario Valdez
Jacobs Irrigating ditch . . . . .	(Rock Springs and Spgs of Red Hill)	Mar. 12, 1888	May 1, 1886	18.00	Albert Jacobs
††Alamosa Creek canal, enlargement . . . . .	Alamosa creek . . . . .	July 24, 1888	June 25, 1888	21.00	W. C. Baldwin, et al.

\*Date of appropriation claimed, June 1, 1884.

†Date of appropriation claimed, May 1, 1887.

‡Capacity of ditch, as enlarged, 79.6 cubic feet per second. A second filing, practically same as above, made September 24, 1887.

§Total capacity of ditch claimed to be 250 cubic feet per second.

||Water claimed to have been appropriated by original construction, November 8, 1885.

•Water claimed to have been appropriated by original construction, April 10, 1870.

\*\*Water claimed by enlargement from November 2, 1886.

††Water claimed to have been appropriated by original construction, May 15, 1885.

†††Total capacity 291.00 cubic feet per second.

# STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 21,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inches)	Length of case, (in feet).	DEPTH OF FLOW BELOW SURFACE.				LOCATION.	Present flow in gallons per minute.
				First flow.	Second flow.	Third flow.	Fourth flow.		
E. C. Newcomb . . . . .	85	3	62	75			80	Sec 5, T 85, R 8, Conejos Co.	30
San Luis Valley Town and Investm't Co. . . . .		2	70	80			90	Tp 35, R 10, Conejos Co. . .	35
La Jara Creamery and Live Stock Co. . . . .	80	3	39	65			72	Sec 25, T 36, R 9 E. Con. Co	15
C. C. Cairico . . . . .	99	2	71	82			90	Sec 18, T 36, R 9, Conejos Co.	3
La Jara Town Co. . . . .	95	2	68	80	85		85	. . . . .	40
Louis J. Chapman . . . . .	80	3	38	61			67	Sec 27, T 36, R 9, Conejos Co.	5
W. H. Adams . . . . .	110	2	84	60	85	95	107	Sec 34, T 36, R 9, Conejos Co.	4
John Harvey . . . . .	192.6	3	191.9	95			192.6	Sec 8, T 35, R 9, Conejos Co.	About 400
George S. Mattison . . . . .	235	1 1/4	235	140	180	200	235	Sec 7, T 38, R 11, Costilla Co.	2 1/2
Henry Backus . . . . .	300	2	159	150	180	260	280	Sec 32, T 38, R 10. . . . .	4
Henry Backus . . . . .	135	2	130	130					1
Town of Alamosa . . . . .	203	3	137	130	185		185	Town of Alamosa . . . . .	2

## WATER DISTRICT No. 22.

*Water District No. 22—A. M. Vigil, Water Commissioner.* Appointed April 15, 1887. Post-office address, Conejos, Conejos county, Colorado.

Water District No. 22, consists of all lands in the State of Colorado irrigated from ditches or canals taking water from the Conejos creek and its tributaries.

A plat of this district, prepared from the report of the water commissioner thereof, is found in Part II. of this report.

Mr. Vigil reported for the year 1888, the following particulars concerning the ditches, and the use made of water in Water District No. 22:

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 22,  
BY THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Guadalupe . . . . .	5	2,000			665	610
Head's Mill . . . . .	2 $\frac{1}{2}$	320			145	15
El Coda . . . . .	3 $\frac{1}{2}$	1,005			360	275
Llano . . . . .	4	800			310	210
Garcia . . . . .	3 $\frac{1}{2}$	320			320	
Servielta . . . . .	5	1,440			410	330
S. Valdez . . . . .	2	320			320	
Los Pinos . . . . .	1 $\frac{1}{4}$	480			240	240
Salazar . . . . .	1 $\frac{1}{4}$	160			100	25
Mill . . . . .	$\frac{1}{2}$	40			40	
San José . . . . .	4	800			400	180
Senecero . . . . .	3 $\frac{1}{4}$	730			400	330
Del Puerticita . . . .	1 $\frac{1}{2}$	160			60	100
San Rafael and Conejos	4	1,360			440	360
El Serito . . . . .	4 $\frac{1}{4}$	120			80	20
Gabriel Martinez . . . .	1 $\frac{1}{2}$	480				40

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
Santiago . . . . .	3	2,000			1,200	120
Archuleta & P. No. 1 . .	1½	100			100	
Archuleta & P. No. 2 . .	½	60			60	
Overflow . . . . .	1	160			100	60
Trujillo . . . . .	1½	690			300	240
Cañon . . . . .	5	1,400			500	300
La Del Rio . . . . .	4	860			300	210
Rencomies . . . . .	3	600			270	180
Puerticitas . . . . .	1½	720			360	280
Mecitas . . . . .	4½	1,800			730	510
San Juan and San Rafael	2¼	960			390	235
Espenrinoa . . . . .	1	80			80	
Chacon No. 1 . . . . .	2¼	180			100	60
Las Sauces . . . . .	3¼	2,120			830	510
Loboto . . . . .	2	320			320	
Jose B. Romero . . . . .	3	1,300			1,000	300
Benardo Romero . . . .	3	480			300	110
Galbis . . . . .	1½	140			60	60
Sanchez . . . . .	3	640			300	200
Chacon No. 3 . . . . .	2	120			40	80
Sabru School Section . .	1	320			240	60
J. D. Martinez . . . . .	1	160			100	45
Vega Grande . . . . .	1¾	400			330	40
Au Cere . . . . .	2¼	480			180	160
Stewart & Co . . . . .	2½	843			300	20
Chacon No. 2 . . . . .	2½	360			180	180
Lobato . . . . .	1	60			60	
McCarroll . . . . .	2½	540			200	230
Manassa . . . . .	4	3,200	100	100	400	2,600
Sabine No. 1 . . . . .	2½	80			80	
Martinez . . . . .	8	720			300	220



NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
J. M. Espenola . . . . .	$\frac{1}{4}$	240			175	55
Cordova . . . . .	$\frac{1}{2}$	243			150	65
Chavis. . . . .	1	320			155	105
Jacks . . . . .	$\frac{1}{2}$	160			40	105
Ephraim . . . . .	5	4,280	150	175	600	2,100
Martinez . . . . .	2	320			285	35
Los Ojos No. 2. . . . .	$1\frac{1}{4}$	320			320	
Richfield . . . . .	5	2,720	70	150	600	1,360
Loma Parda. . . . .	3	480	10	25	100	220
Beecroft . . . . .	$1\frac{1}{2}$	220		30	100	80
Sabine No. 2. . . . .	$1\frac{1}{4}$	320			300	20
Los Ojos No. 1. . . . .	$3\frac{1}{4}$	1,420			800	330
Elledge . . . . .	1	160			160	
Angustura . . . . .	$2\frac{1}{2}$	160			120	40
North-Eastern . . . . .	9	1,920			480	

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 22,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Mogote ditch	Conejos river	Aug. 16, 1887	June 2, 1887	520.00	{ The Mogote Ditch Co., D. E. Newcomb, President.
North-Eastern ditch, enlargement	Conejos creek	Jan. 20, 1888	Oct. 20, 1887		George W. Perkins et al.
Branch ditch	{ North branch of Conejos creek.	Jan. 31, 1888	Nov. 1, 1887		T. W. Johnson et al.
The Paine Irrigating Ditch No. 1.	{ Arroyo, or arm of Conejos river.	Feb. 27, 1888	Feb. 11, 1888	6.35	Charles Paine
The Paine Irrigating Ditch No. 2	{ Arroyo, or arm of Conejos river.	Feb. 27, 1888	Feb. 11, 1888	14.00	Charles Paine
Martin ditch	Rio Conejos	Mar. 7, 1888	Feb. 29, 1888	12.00	William Martin
Lateral of the Richfield canal	{ Rio Conejos, via Richfield canal.	Mar. 13, 1888	Nov. 10, 1885	24.00	{ The Richfield Canal Co., S. C. Berthel-son, President.
{The enlargement of the An. Con. Irrigating ditch.	Conejos river	April 25, 1888	April 14, 1885	17.20	José Victor Garcia et al.
Stover ditch	{ North branch of Rio Conejos.	May 11, 1888	April 20, 1888	12.00	Cornelius J. Stover
{Enlargement of the Martinez ditch.	San Antonio river	May 25, 1888	Mar. 24, 1888	19.29	J. J. Corlett et al.
{The North-Eastern ditch, enlargement.	Conejos river	June 19, 1888	Mar. 21, 1888	42.80	G. W. Perkins et al.
The Home ditch	Rio Conejos	June 23, 1888			O. F. Smith, Jr.
{Berkshire Farm ditch	Rio Conejos	July 16, 1888	Mar. 15, 1888	25.00	Frank G. Blake, John H. Smith
Smith Brothers ditch	Springs and slough	Aug. 9, 1888	May 1, 1886	35.64	T. A. Smith, E. D. Smith

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 22—Continued.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Slough ditch	Rio Con. & springs	Aug. 16, 1888	June 13, 1888	15.00	Nicholas W. Miller, H. C. McDaniel
†The second enlargement of the An. Con. Irrigating ditch.	Conejos river	Aug. 24, 1888	Aug. 18, 1888	10.80	George W. Bardsley
**The Bagwell Irrigating ditch	Conejos river	Sept. 11, 1888	Mar. 13, 1885	9.72	W. H. Bagwell
The De Herrera Irrigating ditch.	San Antonio river	Oct. 12, 1888	July 5, 1886	8.30	Ramon D. Herrera, Andres Francisco
††The Poncha Irrigating ditch	San Antonio river	Oct. 19, 1888	Sept. 29, 1888	51.46	L. B. Pierce et al.
The Mountain Irrigating ditch	Trail creek and Willow creek.	Nov. 15, 1888	Sept. 5, 1888	13.07	William Chambers et al.
††The Taos Valley canal	Conejos river	Nov. 17, 1888	Nov. 28, 1887		James M. Piper et al.
‡Taos Valley Co.'s canal; also Taos Valley canal.	San Antonio river	Nov. 21, 1888	Aug. 25, 1888	300.00	Taos Valley Co., Earnest G. Miller, Engineer.
‡‡Poncha Creek lateral	San Antonio river	Nov. 21, 1888			Taos Valley Co., Earnest G. Miller, Engineer.

\*Total capacity of ditch, 28.00 cubic feet per second.

†Total capacity claimed to be 32.97 cubic feet per second.

††Total capacity, 122.80 cubic feet per second.

‡3,200 cubic inches per second; claimed, 25 cubic feet per second.

‡‡Total capacity stated to be 38.80 cubic feet per second.

\*\*Water claimed to have been appropriated April 1, 1886.

††Supplies Poncha Reservoir No. 1 and Poncha Reservoir No. 2.

•††103,500 cubic inches per second of time claimed.

‡Reservoirs are shown on the line of this ditch, but description thereof not given.

‡‡This ditch is connected with Poncha Reservoir No. 1 and Poncha Reservoir No. 2. Capacity claimed to be sufficient to irrigate 9,000 acres. Also called Poncha lateral.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 22,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER, PREVIOUS TO DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream supplying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
Puncha Reservoir No. 1 . . .	{ San Antonio river.	{ The Puncha Irrig'tg ditch	Oct. 19, 1888	Sept. 29, 1888	4,000,000	L. B. Pierce et al
Puncha Reservoir No. 2 . . .	{ San Antonio river.	{ The Puncha Irrig'tg ditch	Oct. 19, 1888	Sept. 29, 1888	2,000,000	L. B. Pierce et al
*Puncha Reservoir No. 1 . . .	{ San Antonio river.	{ The Puncha creek lateral	Nov. 21, 1888			Taos Valley Co., Earnest G. Miller, eng'r
†Puncha Reservoir No. 2 . . .	{ San Antonio river.	{ The Puncha creek lateral	Nov. 21, 1888			Taos Valley Co., Earnest G. Miller, eng'r

\* Said to cover 60 acres. † Said to cover 40 acres; capacity of Puncha Reservoirs Nos. 1 and 2 said to be sufficient to irrigate 7,000 acres.

## WATER DISTRICT No. 24.

*Water District No. 24*—No water commissioner has been appointed for this district.

Water District No. 24 consists of all lands irrigated from ditches or canals taking water from the Culebra creek and its tributaries, and as much of the lands as lie in the State of Colorado as are irrigated from ditches or canals taking water from the Costilla creek and its tributaries.

## WATER DISTRICT No. 25.

*Water District No. 25*—No water commissioner has been appointed for this district.

Water District No. 25 consists of all lands irrigated from ditches or canals taking water from the San Luis creek and its tributaries.



# STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 25,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH	Stream from which water is diverted	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
* Jardon's ditch . . . . .	Kelley creek . . . . .	Aug. 16, 1887	May 12, 1887	15.00	A. F. Jardon, J. W. Bolton
† The Little Frankie ditch . . . . .	Uracca creek . . . . .	Sept. 9, 1887	Sept. —, 1888	2.00	Emma M. Capers, Francis L. Capers
The Adler creek ditch . . . . .	Alder creek . . . . .	Sept. 9, 1887	June 4, 1887	10.00	W. B. Clark et al.
The Norris ditch . . . . .	Kerber creek . . . . .	Mar. 13, 1888	Feb. 8, 1887	3.00	W. R. Norris
‡ Thurston & Cooper's ditch . . . . .	San Luis creek . . . . .	Mar. 21, 1888	Mar. 15, 1888	3.00	Isaac Thurston, Richard Cooper
The Hamilton ditch . . . . .	Rito Alto creek . . . . .	Mar. 23, 1888	Mar. 8, 1888	18.50	Daniel V. Hamilton
Clayton ditch, A . . . . .	Kelley creek . . . . .	Mar. 29, 1888	April —, 1886	2.25	W. M. Clayton & Co.
Clayton ditch, B . . . . .	Kelley creek . . . . .	Mar. 29, 1888	April —, 1886	2.25	W. M. Clayton & Co.
§ Clayton ditch, C . . . . .	Kelley creek . . . . .	Mar. 29, 1888	. . . . .	2.25	W. M. Clayton & Co.
Clayton ditch, D . . . . .	Kerber creek . . . . .	Mar. 29, 1888	. . . . .	2.25	W. M. Clayton & Co.
Clayton ditch, E . . . . .	Cottonwood creek . . . . .	Mar. 29, 1888	Mar. —, 1888	3.25	W. M. Clayton & Co.
* Lee C. Eagles' ditch . . . . .	. . . . .	April 4, 1888	April —, 1888	2.00	Lee C. Eagles

\* Seems also to be known as Kelley creek irrigating ditch.

† There is some doubt as to the water district in which this ditch is situated.

‡ This ditch also draws water from the Kerber ditch.

§ Said to have been built in 1886.

|| Said to have been built in the fall of 1871.

\* There seems to have been an enlargement of this ditch, in which P. W. Hill is interested.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 25—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Stratton & Harrison ditch . . . .	Steele creek . . . .	April 11, 1888	. . . . .	2.2	Mrs. Mary A. Stratton, H. A. Harrison
Frazees ditch . . . . .	San Isabel creek . . . .	April 11, 1888	Mar. 9, 1888	7.00	C. T. Frazee, H. C. Frazee
Fowler ditch . . . . .	San Luis creek . . . .	April 11, 1888	Mar. 15, 1888	18.00	L. F. Fowler et al.
* Bolton ditch . . . . .	San Luis creek . . . .	April 17, 1888	. . . . .	5.00	J. W. Bolton
† Henkanfer ditch . . . . .	Crestone creek . . . .	May 9, 1888	. . . . .	. . . . .	Hugo Henkanfer
Lee C. Eagles' ditch . . . . .	Silver creek . . . . .	May 12, 1888	. . . . .	2.25	. . . . .
‡ San Isabel ditch . . . . .	San Isabel creek . . . .	May 25, 1888	. . . . .	26.00	D. C. Travis et al.
§ North ditch . . . . .	San Isabel creek . . . .	May 25, 1888	. . . . .	13.00	G. C. Travis et al.
Wales & Travis ditch . . . . .	Rito Alto creek . . . .	May 25, 1888	. . . . .	29.00	D. C. Travis et al.
Wales & Shellabarger ditch . . . .	Rito Alto creek . . . .	May 25, 1888	. . . . .	. . . . .	D. C. Travis
¶ Sanford ditch . . . . .	Rito Alto creek . . . .	May 25, 1888	. . . . .	26.00	San Isabel Land and Live Stock Co., D. C. Travis, general manager.
** West Extension of Wales & Shellabarger ditch . . . . .	San Luis creek . . . .	May 25, 1888	. . . . .	7.00	D. C. Travis et al.
†† East Extension of Wales & Shellabarger ditch . . . . .	San Luis creek . . . .	May 25, 1888	. . . . .	12.00	D. C. Travis et al.
‡‡ Nash ditch . . . . .	San Isabel creek . . . .	June 4, 1888	April 20, 1888	13.00	Harrison Nash
§§ Skinner ditch No. 1 . . . . .	Little Kerber creek . . . .	June 5, 1888	. . . . .	1.00	O. C. Skinner
Skinner ditch No. 2 . . . . .	Little Kerber creek . . . .	June 5, 1888	. . . . .	1.00	O. C. Skinner
¶¶ Skinner ditch No. 3 . . . . .	Little Kerber creek . . . .	June 5, 1888	. . . . .	1.00	O. C. Skinner

The Sierra Blanca ditch . . . . .	Uracca creek . . . . .	June 6, 1888	Sept. 2, 1887	52.00	The Sierra Blanca Ditch and Irrigation Co., P. W. Jones, president.
***Sanchez ditch . . . . .	Cotton creek . . . . .	June 7, 1888	. . . . .	2.88	. . . . . William Volk
Cut Off ditch . . . . .	{ Arroyo, or old Kerber creek. }	June 9, 1888	May 14, 1888	7.00	Richard Cooper, Isaac Thurston
†††Cooper & Thurston ditch . . . . .	{ Kerber creek. }	June 9, 1888	Mar. 19, 1888	8.00	Richard Cooper, Isaac Thurston
Clelcoe ditch . . . . .	Kerber creek . . . . .	June 22, 1888	April 23, 1887	8.00	T. H. Thompson, John M. White
Boughton ditch . . . . .	Spring . . . . .	June 22, 1888	June 11, 1888	6.00	. . . . . S. S. Boughton
Ashley ditch . . . . .	Willow creek . . . . .	June 26, 1888	June 2, 1887	8.00	. . . . . John E. Ashley, David Barrows
†††High Line ditch . . . . .	{ Black Cañon creek Smith's gulch. }	July 12, 1888	May 25, 1888	25.25	. . . . . J. H. Bachelder et al
L. C. Charles ditch . . . . .	Crestone creek. . . . .	Aug. 6, 1888	. . . . .	23.78	. . . . . L. C. Charles
Swidensky ditch . . . . .	Gooseberry creek . . . . .	Aug. 9, 1888	. . . . .	3.00	. . . . . James B. Swidensky
‡‡‡The Pessere ditch No. 1 . . . . .	Donath Spring creek . . . . .	Aug. 25, 1888	May 29, 1888	5.90	. . . . . Max Pessere

\* Said to have been "located" May 15, 1887.

† Work of completion of said ditch was on the second day of May, 1888.

‡ Constructed in spring of 1882.

‡ Constructed in 1886.

‡ Constructed in spring of 1885.

• Constructed in 1885.

\*\* Constructed in spring of 1887.

†† Constructed in spring of 1887.

‡‡ This ditch seems to be in part an enlargement of the Frazee ditch, and is said to "follow the course" of the San Isabel ditch.

‡‡ Said to have been constructed in 1884.

‡‡ Said to have been constructed in 1885.

• Said to have been constructed in 1884.

\*\*\* Work of construction begun and completed in 1873.

††† Also takes water from ditches owned by Joseph H. Wells.

††† A reservoir hereinafter designated "High Line reservoir" is connected herewith.

‡‡‡ Water also obtained from an abandoned mining tunnel.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 25,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic ft.	NAME OF CLAIMANT.
High Line reservoir . . .	{ Bl'k Cañon creek and Smith's gul }	High Line . . .	July 12, 1888	May 25, 1888	2,000,000.00	J. H. Batchelder et al

## WATER DISTRICT No. 26.

*Water District No. 26.*—No water commissioner has been appointed for this district.

Water District No. 26 consists of all lands irrigated from ditches or canals taking water from the Saguache creek and its tributaries.



## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 26,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Freise Ditch No. 1 . . . . .	Saguache creek . . . . .	Sept. 22, 1887	April 20, 1884	4.50	Henry Freise
Freise Ditch No. 2 . . . . .	Saguache creek . . . . .	Sept. 22, 1887	June 11, 1887	2.25	Henry Freise
* Holcomb ditch . . . . .	Saguache river . . . . .	Sept. 26, 1887	. . . . .	10.00	John W. Holcomb
Erie ditch . . . . .	O. Bergfeldt arroyo . . . . .	Oct. 19, 1887	Sept. 14, 1887	18.00	Patrick G. Gow
Stephens ditch . . . . .	Stephens spring . . . . .	Oct. 26, 1887	. . . . .	4.00	John A. Stevens
John Hill ditch . . . . .	Spring creek . . . . .	Oct. 27, 1887	. . . . .	3.00	John F. Hill
Timber Lake ditch . . . . .	Saguache river . . . . .	Oct. 31, 1887	April 15, 1887	3.00	James Buchanan et al.
Green's Company ditch . . . . .	Fred's arroyo, b'h } Saguache creek }	Nov. 25, 1887	Nov. 11, 1887	6.2	William Green et al.
Ziegler Brothers' ditch . . . . .	Saguache creek . . . . .	Dec. 14, 1887	May —, 1885	106.60	M. Ziegler et al
Fry ditch . . . . .	Siwatch river . . . . .	Dec. 30, 1887	April 21, 1887	15.00	J. A. Fry Mary Fry
Hawkeye ditch . . . . .	Siwatch river . . . . .	Jan. 18, 1888	Nov. 12, 1887	25.00	F. S. Kirkeudall et al.
Alfast ditch . . . . .	Siwatch river . . . . .	Jan. 20, 1888	Dec. 31, 1887	8.00	Larson Alfast
Hodding Ditch No. 1 . . . . .	Hodding creek . . . . .	Jan. 24, 1888	July 20, 1887	2.50	S. W. Hodding
John O'Niel's ditch . . . . .	Jones' spring . . . . .	Feb. 8, 1888	Jan. 20, 1888	2.00	John O'Niel

Erie Extension ditch . . . . .	Siwatah river. . . . .	Feb. 25, 1888	Nov. 26, 1887	14.00	A. W. MacLeod, P. G. Gow
2 Arroyo ditch . . . . .	{ Arroyo of Saguache river. }	Mar. 1, 1888			W. T. Ashley et al.
20 Shore ditch . . . . .	Siwatah river. . . . .	Mar. 6, 1888		10.00	G. W. Means et al.
6 Middle ditch. . . . .	Siwatah river. . . . .	Mar. 6, 1888		8.50	Horace Means, George W. Means
** North ditch. . . . .	Sullivan arroyo . . . . .	Mar. 6, 1888		13.00	Horace Means, George W. Means
†† Ashley & Means ditch . . . . .	Sullivan arroyo . . . . .	Mar. 6, 1888		9.00	Horace Means, Samuel Ashley
Flood ditch . . . . .	Siwatah river. . . . .	Mar. 17, 1888	Dec. 31, 1887	7.00	P. F. Flood, George W. Keesey
†† Arroyo ditch . . . . .	Arroyo . . . . .	Mar. 21, 1888			George A. Holcomb, John T. Farrington
Udell & Means ditch . . . . .	Sullivan arroyo . . . . .	Mar. 23, 1888	June —, 1887	15.00	G. N. Udell, Horace Means
Hotchkiss ditch . . . . .	Siwatah creek . . . . .	Mar. 28, 1888	Dec. 28, 1887	11.00	B. S. Hotchkiss
Forbes ditch . . . . .	O. Bergfeldt arroyo . . . . .	April 18, 1888	April 3, 1888	4.00	B. J. Forbes
Sheek ditch . . . . .	Siwatah river. . . . .	May 3, 1888	Mar. 26, 1888	3.00	William B. Sheek
Miely ditch . . . . .	O. Bergfeldt arroyo . . . . .	May 9, 1888	Mar. 1, 1888	12.00	A. B. Miely
Travis ditch. . . . .	Siwatah river. . . . .	May 25, 1888	April 19, 1888	16.00	The San Isabel Land and Live Stock Co., D. C. Travis, Gen. Man.
Willard extension of the Miely ditch . . . . .	O. Bergfeldt arroyo . . . . .	July 27, 1888		3.00	Henry Willard
MacLeod ditch. . . . .	San Juan creek . . . . .	July 27, 1888		6.00	Mrs. M. E. MacLeod
Fair Play ditch . . . . .	Sullivan arroyo . . . . .	July 27, 1888	April 27, 1888	31.00	Henry Horton et al.
Downer Ditch No. 1. . . . .	{ Russell's arroyo, branch Saguache creek. }	July 28, 1888	April 20, 1875	5.25	Lawrence C. Daniels
Campbell ditch No. 1. . . . .	Saguache creek . . . . .	Aug. 8, 1888	Sept. —, 1874	16.00	Horace Campbell
Campbell ditch No. 2. . . . .	Saguache creek . . . . .	Aug. 8, 1888	— — —, 1876	7.33	Horace Campbell
Campbell ditch No. 3. . . . .	Saguache creek . . . . .	Aug. 8, 1888	Aug. —, 1876	14.33	Horace Campbell
Campbell ditch No. 4. . . . .	Saguache creek . . . . .	Aug. 8, 1888	— — —, 1877	11.00	Horace Campbell

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 26—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in state Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT
Campbell ditch No. 5 . . . . .	Saguache creek . . . . .	Aug. 8, 1888	—, 1887	13.75	Horace Campbell
Campbell ditch No. 6 . . . . .	Saguache creek . . . . .	Aug. 8, 1888	June —, 1875	17.75	Horace Campbell
** Campbell ditch No. 7 . . . . .	Russell's arroyo . . . . .	Aug. 8, 1888	May —, 1886	7.33	Horace Campbell
Union ditch . . . . .	O. Bergfeldt arroyo . . . . .	Aug. 15, 1888		12.00	Mathew Connor, Charles B. Phillips
Stubbs-Callegos ditch, . . . . .	Saguache creek . . . . .	Sept. 19, 1888	April 10, 1882	12.50	Joseph A. Stubbs et al.
Macawpot ditch. . . . .	Siwatach river. . . . .	Sept. 25, 1888	July 27, 1888	15.00	John W. McCaw et al.
†† Conard ditch . . . . .	O. Bergfeldt arroyo . . . . .	Sept. 25, 1888	May 20, 1888	13.00	Nathan F. Conard et al.
Farrington ditch No. 2 . . . . .	Saguache creek . . . . .	Oct. 2, 1888	July 2, 1888	8.53	John Farrington
††† Seitz & McClure ditch . . . . .	Siwatach river. . . . .	Nov. 2, 1888	May —, 1873	17.00	Est. John Shane, W. T. Seandrett, Adm.
Seitz & McClure ditch, enlargement†	Siwatach river. . . . .	Nov. 2, 1888	Oct. 25, 1888	8.00	Est. John Shane, W. T. Seandrett, Adm.

\* Original construction began in May, 1886, and work of enlargement in May, 1887.

† This claims to be an enlargement of the Pay ditch.

†† A reservoir is shown connected therewith.

††† Capacity of arroyo claimed to be 16.00 cubic feet per second.

‡ Said to have been constructed in July, 1876.

‡‡ Said to have been constructed in April, 1883.

‡‡† Said to have been constructed in April, 1887.

‡‡‡ Said to have been constructed in April, 1876.

†† Work commenced on ditch, June, 1887; on enlargement, March, 1888.

‡ Also claims overflow of Siwatach river and various branches.

‡‡ Capacity of Xieley ditch said to be 13 cubic feet per second; time of construction, June, 1888.

‡‡† Said to have been "dug" in 1880, or near that time

‡‡‡ Originally constructed in 1878; extended in May, 1886.

††† Water said to have been appropriated by original construction on or about April 16, 1888.

‡‡‡ Total capacity of ditch is 25 cubic feet per second.

## WATER DISTRICT No. 27.

*Water District No. 27—Mark Bedill, Water Commissioner.*

Water District No. 27 consists of all lands irrigated from ditches or canals taking water from Turtle, Carnero, La Garita and all other creeks and their tributaries which have their sources of water supply in the La Garita mountains, and flow eastward into the San Luis valley.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 27,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER, PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of Filing in State Engineer's office.	Time of Com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
*Bish ditch . . . . .	Carnero creek . . . . .	Sept. 29, 1887 . . . . .		2.50	Sylvester Bish

\*Water claimed to have been appropriated by original construction, July 1, 1887.



## WATER DIVISION No. 35.

*Water Division No. 35.*—There is no water commissioner for this district.

Water District No. 35 consists of all lands lying in the county of Costilla, of this State, watered by the Trinchera river and its tributaries.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 35,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office	Time of com- mencement of work thereon	Capacity claimed in cubic feet per sec.	NAME OF CLAIMANT
*Trinchera ditch . . . . .	Rio Trinchera . . . . .	April 12, 1888	Dec. 10, 1887	305.00	{ The Trinchera Canal Co., Wm. A. Bell, President.
†Garland ditch . . . . .	{ Saugre de Cristo { and Ute creek }	April 12, 1888	Oct. 16, 1887	212.00	{ The Trinchera Canal Co., Wm. A. Bell, President.

\*Capacity after first 500 feet is 212 cubic feet per second.

†Capacity to head-gate No. 2 is 198 cubic feet per second, and from head-gate No. 2 to junction with main canal, 325 cubic feet per second.

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MISCELLANEOUS.

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## STATEMENT CONCERNING DITCHES IN WATER DIVISION No. 3,

WHICH ARE EITHER IN NO WATER DISTRICT, OR ARE SO INDEFINITELY DESCRIBED THAT THE DISTRICT IN WHICH THEY ARE SITUATED CAN NOT BE DETERMINED, AND RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER, PREVIOUS TO DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
<i>a</i> Meadow ditch. . . . .	Spring creek. . . . .	July 16, 1887	. . . . .	. . . . .	Ira J. Bloomfield
<i>b</i> Shotwell ditch. . . . .	Rock creek. . . . .	Dec. 1, 1887	. . . . .	3.22	E. H. Shotwell
<i>c</i> The Spring Creek Ditch No. 1, enlargement. . . . .	Spring creek. . . . .	Jan. 9, 1888	Nov. 1, 1887	36.60	Samuel A. Thomas, et al
<i>d</i> The Rio Grande and Piedra Valley Waste ditch. . . . .	. . . . .	Jan. 9, 1888	Nov. 1, 1887	16.00	Samuel A. Thomas, et al
<i>e</i> Myers Ditch No. 1. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	2.00	H. Z. Myers
<i>f</i> Myers Ditch No. 2. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	2.00	H. Z. Myers
<i>g</i> Myers Ditch No. 3. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	6.00	R. A. Myers, Reuben Myers
<i>h</i> Myers Ditch No. 4. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	4.00	R. A., H. Z. and Geo. S. Myers
<i>i</i> Myers Ditch No. 5. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	4.00	R. A., H. Z. and Geo. S. Myers
<i>j</i> Myers Ditch No. 6. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	4.00	R. A., H. Z. and Geo. S. Myers
<i>k</i> Myers Ditch No. 7. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	3.00	R. A., H. Z. and Geo. S. Myers
<i>l</i> Myers Ditch No. 8. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	5.00	R. A., H. Z. and Geo. S. Myers
<i>m</i> Myers Ditch No. 9. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	2.00	Reuben Myers
<i>n</i> Myers Ditch No. 10. . . . .	Raton creek. . . . .	Jan. 24, 1888	. . . . .	3.00	R. A., H. Z., Geo. S. and Reuben Myers

<i>o</i> Myers ditch No. 11	Raton creek	Jan. 24, 1888	5.00	Geo. S. Myers
<i>p</i> Myers ditch No. 12	Raton creek	Jan. 24, 1888	5.00	Geo. S. Myers
<i>q</i> Myers ditch No. 13	Raton creek	Jan. 24, 1888	2.00	Geo. S. Myers
<i>r</i> Rushworth ditch	Slough	April 17, 1888	12.50	Wm. A. Rushworth
Spruce Lawn ditch	Spring creek	April 21, 1888	21.80	Lincoln Hardesty, et al
<i>s</i> Murray ditch	Dry creek	May 11, 1888	17.00	James M. Murray
<i>t</i> Eagle ditch	Rock creek,	June 22, 1888	9.00	E. J. Eagle
<i>u</i> Schwartz ditch	Rock creek,	July 25, 1888	4.00	Henry S. Shwartz
<i>v</i> Wm. Peachey ditch	Rock creek,	July 31, 1888	12.00	Mary Peachey

*a* The date of appropriation of water by original construction is June 24, 1886; the amount of water claimed under said construction, is 10.84 cubic feet per second: the date of appropriation by the enlargement of this ditch is May 16, 1887, and the amount of water claimed by and under said ditch, is 10.84 cubic feet per second, and the present capacity of the ditch is given at 10.84 cubic feet per sec. The water was appropriated by original appropriation on June 15, 1884.

*c* The carrying capacity of this ditch, before enlargement is stated to be 13.40 cubic feet per second, and the total capacity after enlargement is stated to be 50 cubic feet per second.

*d* This ditch is stated to have been constructed to appropriate all of the waste waters of the Rio Grande and Piedra Valley ditch.

*e* Water claimed to have been appropriated by original construction, May, 1881.

*f* Water claimed to have been appropriated by original construction, May 1, 1881.

*g* Water claimed to have been appropriated by original construction, June, 1876.

*h* Water claimed to have been appropriated by original construction, June, 1876.

*i* Water claimed to have been appropriated by original construction, June, 1876.

*j* Water claimed to have been appropriated by original construction, June, 1876.

*k* Water claimed to have been appropriated by original construction, November 26, 1887.

*l* Water claimed to have been appropriated by original construction, May, 1880.

*m* Water claimed to have been appropriated by original construction, June, 1887.

*n* Water claimed to have been appropriated by original construction, June, 1886.

*o* Water claimed to have been appropriated by original construction, May 1, 1881.

*p* Water claimed to have been appropriated by original construction, June 1, 1879.

*q* Water claimed to have been appropriated by original construction, May 1, 1880.

*r* Water claimed to have been appropriated by original construction, Feb. 9, 1888. This ditch is perhaps in Water District No. 20.

*s* Water claimed to have been appropriated by original construction, April 17, 1888.

*t* Water claimed to have been appropriated by original construction, April 28, 1888.

*u* Water claimed to have been appropriated by original construction, May 1, 1888.

*v* Water claimed to have been appropriated by original construction, April, 1878.

## STATEMENT CONCERNING DITCHES IN WATER DIVISION No. 3.—Continued.

NAME OF DITCH.	Stream from which water is diverted	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
a Win. Peachey ditch, enlargement	Rock creek	July 31, 1888		3.00	Mary Peachey
b Clover Leaf ditch	Rock creek	July 31, 1888		10.00	Mary Peachey
c Clover Leaf ditch, enlargement	Rock creek	May 31, 1888		5.00	Mary Peachey
d Cole Ditch No. 1	Rock creek	Aug. 10, 1888		10.00	Rhoda Cole
e Cole Ditch No. 2	Rock creek	Aug. 10, 1888		15.00	Rhoda Cole
f Bohn ditch	Rock creek	Aug. 14, 1888		5.00	B. C. Bohn
g Larick Ditch No. 2	Branch Rock creek	Aug. 14, 1888		7.00	Henry Larick, F. A. Morehouse
h Newton ditch	Rock creek	Sept. 3, 1888		14.00	Edward E. Newton, John H. Newton
i Larick Ditch No. 1	Branch Rock creek	Sept. 8, 1888		4.00	Henry Larick
j Lateral No. 1 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch)	Sept. 8, 1888		4.00	John B. Heilman
k Rough and Ready ditch	Rock creek	Sept. 8, 1888		55.00	J. B. Heilman, Henry Larick, F. D. Larick
l Lateral No. 2 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch)	Sept. 8, 1888		4.00	John B. Heilman
m Lateral No. 3 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch)	Sept. 8, 1888		2.00	John B. Heilman
n Lateral No. 4 (of the Rough and Ready ditch)	Rock creek	Sept. 8, 1888		3.00	Fred D. Larick
o Lateral No. 5 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch)	Sept. 8, 1888		3.00	Fred D. Larick
p Lateral No. 6 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch)	Sept. 8, 1888		3.00	Fred D. Larick
q Lateral No. 7 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch)	Sept. 8, 1888		4.00	Fred D. Larick



<i>q</i> Lateral No. 8 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	1.50	Fred. D. Larick
<i>r</i> Lateral No. 9 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	2.00	Fred. D. Larick
<i>s</i> Lateral No. 10 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	2.00	Henry Larick
<i>t</i> Lateral No. 11 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch)	Sept. 8, 1888	3.00	Henry Larick
<i>u</i> Lateral No. 12 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	2.00	Henry Larick
<i>v</i> Lateral No. 13 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	3.00	Henry Larick
<i>w</i> Lateral No. 14 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	4.00	Henry Larick
<i>x</i> Lateral No. 15 (of the Rough and Ready ditch)	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	2.00	Henry Larick

- a* Water claimed to have been appropriated by enlargement May 3, 1888, making total capacity 15 cubic feet per second.
- b* Water claimed to have been appropriated by original construction, August 4, 1884, and by enlargement, May 3, 1888. Total capacity claimed, 15 cubic feet per second.
- c* Water claimed to have been appropriated by original construction, April, 1878. D. C. Cole signs as one of the owners.
- d* Water claimed to have been appropriated by original construction, April, 1878. Affidavit signed by D. C. Cole, as one of the owners.
- e* Water claimed to have been appropriated by original construction, June 4, 1888.
- f* Water claimed to have been appropriated by original construction, May 10, 1888.
- g* Water claimed to have been appropriated by original construction, June 7, 1888.
- h* Water claimed to have been appropriated by original construction, July 1, 1878.
- i* Water claimed to have been appropriated by original construction, May 10, 1875.
- j* Water claimed to have been appropriated by original construction, May 1, 1874.
- k* Water claimed to have been appropriated by original construction, May 15, 1875.
- l* Water claimed to have been appropriated by original construction, May 1, 1875.
- m* Water claimed to have been appropriated by original construction, May 1875, and May, 1876.
- n* Water claimed to have been appropriated by original construction, May, 1875, and May, 1876.
- o* Water claimed to have been appropriated by original construction, May, 1875, and May, 1876.
- p* Water claimed to have been appropriated by original construction, May, 1875, and May, 1876.
- q* Water claimed to have been appropriated by original construction, May, 1875, and May, 1876.
- r* Water claimed to have been appropriated by original construction, May, 1875, and May, 1876.
- s* Water claimed to have been appropriated by original construction, May 1, 1875.
- t* Water claimed to have been appropriated by original construction, May 1, 1875.
- u* Water claimed to have been appropriated by original construction, May 1, 1875.
- v* Water claimed to have been appropriated by original construction, May 1, 1875.
- w* Water claimed to have been appropriated by original construction, May 1, 1875.
- x* Water claimed to have been appropriated by original construction, June 5, 1886.

STATEMENT CONCERNING DITCHES IN WATER DIVISION No. 3.—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
<i>a</i> Lateral No. 16 (of the Rough and Ready ditch) . . . . .	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	.....	2.00	Henry Larick
<i>b</i> Lateral No. 17 (of the Rough and Ready ditch) . . . . .	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	.....	6.00	Henry, Fred. D. Larick, John B. Heilman
<i>c</i> Lateral No. 18 (of the Rough and Ready ditch) . . . . .	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	.....	2.00	Henry Larick
<i>d</i> Lateral No. 19 (of the Rough and Ready ditch) . . . . .	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	.....	2.00	Henry, Fred. D. Larick, John B. Heilman
<i>e</i> Lateral No. 20 (of the Rough and Ready ditch) . . . . .	Rock cr'k (via Rough and Ready ditch).	Sept. 8, 1888	.....	2.00	Henry Larick
<i>f</i> Larick ditch No. 3 . . . . .	Branch Rock creek	Sept. 8, 1888	.....	6.00	Henry Larick
<i>g</i> Larick ditch No. 4 . . . . .	Rock creek. . . . .	Sept. 8, 1888	.....	7.00	Henry Larick
<i>h</i> Larick ditch No. 5 . . . . .	Branch Rock creek	Sept. 8, 1888	.....	6.00	Henry Larick
<i>i</i> The Perkins ditch . . . . .	Pinos creek. . . . .	Oct. 1, 1888	.....	17.00	Vasco Perkins et al.
<i>j</i> The Anderson ditch . . . . .	Rock creek. . . . .	Sept. 14, 1888	.....	10.00	F. F. Anderson, R. Cadle
<i>k</i> The Mallett ditch . . . . .	Pinos creek . . . . .	Oct. 1, 1888	.....	8.00	George R. Mallett, George Mallett
<i>l</i> The Perkins ditch . . . . .	Pinos creek . . . . .	Oct. 1, 1888	.....	17.00	Vasco Perkins et al.
<i>m</i> Cadle ditch No. 1 . . . . .	Rock creek. . . . .	Oct. 2, 1888	.....	15.00	Richard Cadle
<i>n</i> Cadle ditch No. 2 . . . . .	Rock creek. . . . .	Oct. 2, 1888	.....	8.00	Richard Cadle
<i>o</i> Cadle ditch No. 3 . . . . .	Rock creek. . . . .	Oct. 2, 1888	.....	8.00	S. J. Cadle, Richard Cadle
<i>p</i> The Brook Farm ditch . . . . .	Rock creek. . . . .	Oct. 2, 1888	.....	7.00	David S. Anes, Hattie E. Lovejoy
<i>q</i> The Schrader ditch No. 1 . . . . .	Schrader creek. . . . .	Oct. 19, 1888	.....	5.00	Herman J. Schrader

<i>j</i> The Schrader Ditch No. 1 . . . . .	Schrader creek . . . . .	Oct. 19, 1888	6.00	Herman J. Schrader
Costlow ditch . . . . .	San Juan creek . . . . .	Nov. 3, 1888	6.00	James W. Coslow
<i>s</i> Dupke Ditch No. 1 . . . . .	Rock creek . . . . .	Nov. 10, 1888	2.00	August Dupke
<i>l</i> Dupke Ditch No. 2 . . . . .	Rock creek . . . . .	Nov. 10, 1888	2.00	August Dupke
<i>u</i> Dupke Ditch No. 3 . . . . .	Rock creek . . . . .	Nov. 10, 1888	2.00	August Dupke
<i>v</i> Dupke Ditch No. 4 . . . . .	Rock creek . . . . .	Nov. 10, 1888	2.00	August Dupke
<i>z</i> Dupke Ditch No. 5 . . . . .	Rock creek . . . . .	Nov. 10, 1888	2.00	August Dupke
<i>x</i> Dupke Ditch No. 6 . . . . .	Rock creek . . . . .	Nov. 10, 1888	2.00	August Dupke
<i>y</i> Sheridan North ditch . . . . .	Br. of Spring creek . . . . .	Nov. 10, 1888	6.50	Patrick J. Sheridan
<i>z</i> Sheridan South ditch . . . . .	Spring creek . . . . .	Nov. 10, 1888	6.50	Patrick J. Sheridan
<i>aa</i> The Meadow Glen ditch . . . . .	Embargo creek . . . . .	Nov. 19, 1888	11.00	Geo. A. Carpenter
<i>a</i> Water claimed to have been appropriated by original construction, June 5, 1886.				<i>k</i> Water claimed to have been appropriated by original construction, May 1, 1878.
<i>b</i> Water claimed to have been appropriated by original construction, June 30, 1875.				<i>l</i> Water claimed to have been appropriated by original construction.
<i>c</i> Water claimed to have been appropriated by original construction, June 30, 1875.				<i>m</i> Date of appropriation claimed by original construction, June, 1876.
<i>d</i> Water claimed to have been appropriated by original construction, June 25, 1877.				<i>n</i> Water claimed to have been appropriated by original construction, June, 1876.
<i>e</i> Water claimed to have been appropriated by original construction, May 15, 1875.				<i>o</i> Water claimed to have been appropriated by original construction, July 15, 1879.
<i>f</i> Water claimed to have been appropriated by original construction, July 1, 1878.				<i>p</i> Water claimed to have been appropriated by original construction, March 20, 1887.
<i>g</i> Water claimed to have been appropriated by original construction, May 1, 1874.				<i>q</i> Water appropriated by original construction, March 1, 1874.
<i>h</i> Water claimed to have been appropriated by original construction, May 1, 1874.				<i>r</i> Water claimed to have been appropriated by original construction, September 1, 1873.
<i>i</i> Water claimed to have been appropriated by original construction, May 1, 1888.				<i>s</i> Date of appropriation by original construction, May 1, 1884.
<i>j</i> Water claimed to have been appropriated by original construction, March 20, 1886, to amount of 6 cubic feet per second, and by enlargement June 4, 1886, 4 cubic feet per second.				<i>t</i> Date of appropriation by original construction, May 1, 1874.
				<i>u</i> Date of appropriation by original construction, May 1, 1874.
				<i>v</i> Date of appropriation by original construction, May 1, 1874.
				<i>w</i> Date of appropriation by original construction, May 1, 1874.
				<i>x</i> Date of appropriation by original construction, May 1, 1874.
				<i>y</i> Date of appropriation by original construction, March 1, 1884.
				<i>z</i> Date of appropriation by original construction, March 1, 1884.
				<i>aa</i> Appropriation by original construction, May, 1888.

## CHAPTER V.

## WATER DIVISION No. 4.

*Water Division No. 4, San Juan Division, William M. May, Superintendent of Irrigation. Appointed May 3, 1888. Address, Dolores, La Plata county, Colorado.*

Water Division No. 4 includes all water districts consisting of the lands in the State of Colorado watered by the San Juan river and its tributaries, and is named the San Juan Division. Water Districts Nos. 29, 30, 31, 32, 33 and 34 are embraced in Water Division No. 4. (See drainage plat of Colorado, Part II. of this report).

The following is the report of Mr. May for the year 1888:

*To the State Engineer:*

SIR:—In submitting to you my report as superintendent of irrigation, Water Division No. 4 of Colorado, I shall state briefly the general characteristics of the several portions of this division.

*First*—There is the county of Archuleta, comprising the most easterly portion of the division, which is principally a grazing country, being for the most part mountainous, with but little arable land, and that chiefly on the Indian reservation, though there are some meadow and hay lands in the vicinity of Pagosa and some farming lands on the Piedra. There have been a few very fine irrigating ditches constructed in this portion of the division, but these, so far as I have been able to learn, have not been adjudicated upon by the courts.

*Second*—There is the county of San Juan, situated entirely within the mountains and being strictly a min-

ing region. There are no farming lands in this portion of the division, with the exception of a few isolated hay ranches. I do not think there is a single irrigating ditch in this county.

*Third*—There is the county of La Plata, lying on the south border of the State and extending to the foot-hills of the mountains, and in some parts including mining regions, as those of the Needle mountains and the La Platas. On the Rio Los Pinos, or Pine river, in the eastern part of this county, and embraced within Water District No. 31, are over 25,000 acres of fine farming land above the line of the Ute reservation. A great many ditches have been taken from Pine river and its tributaries, but no action has been taken to have their rights passed upon by the courts.

The Florida Valley is the next in order as we pass westward. While the Florida is not a large stream, still it affords a very considerable volume of water. In the valley of this stream, and on the adjacent mesas, there are probably 10,000 acres of good farming land. Numerous private ditches and one company ditch have been constructed, diverting the water from the Florida, but, as is the case with the ditches diverting water from the other streams mentioned, no adjudication of water rights has been made here.

*Fourth*—The Animas Valley: The Animas river is by far the largest stream in the county of La Plata. It affords an immense quantity of water, little of which has been utilized on the lands bordering the stream. There are numerous small tributaries emptying into this river that are more convenient for farmers to take their water from than from the river itself. Adjacent to the Animas river and its tributaries, there are upwards of 8,000 acres of arable land, a part of which, near the town of Durango, where the valley of this stream is



called the Upper Animas valley, is in a high state of cultivation. In the lower portion of the valley the river runs through a deep cañon, with little tillable land until it crosses the line of New Mexico. No adjudication of water rights has been had in this district.

*Fifth*—La Plata Valley: The La Plata is a stream similar to the Florida as to size and flow of water. There is but little farming land adjacent to this stream, the military and Indian reservations covering the most valuable portion of the land suitable for agricultural purposes. Several ditches have been constructed diverting water from this stream, which are used chiefly on hay lands. There has been no adjudication of water rights in this portion of the division.

*Sixth*—Mancos Valley: The Mancos is a small stream rising on the western slope of the La Plata mountains, having a south-west course and furnishing water for the irrigation of the valley lands, where about 15,000 acres have been located and settled upon. A large portion of this area is in cultivation, producing fine crops of grain, grasses and vegetables. This stream is taxed to its full capacity to furnish water for the lands already settled upon. Numerous ditches have been taken from the stream, covering the lands on both sides thereof. An effort has been made in District No. 34, the Mancos and its tributaries, to have their water rights adjudicated, but no final decree has been rendered, and the matter is still pending in the court.

This covers all the territory in Water Division No. 4. The Dolores and its tributaries being in Water Division No. 5, places this portion of the country in a very peculiar condition. While the Dolores river and its tributaries afford a large supply of water, the area of tillable land on that stream is confined to a narrow strip of bottom land. On the Dolores the bluffs are high, and the



area of land draining into that stream on the south and west thereof is very small. Immediately from the top of the bluffs, on the south side of this river, the land slopes to the south and south-west, the drainage being into the San Juan. Onto this part of the drainage basin of the San Juan it is impossible to convey water from any stream other than the Dolores. There are two large canals now being constructed to carry water from the Dolores river to irrigate lands on the southern slope, all of which is in the drainage basin of the San Juan. One of these canals, the property of the Montezuma Water Supply Company, has a tunnel 5,400 feet in length, seven by nine feet in section, and with a grade of one foot for each hundred feet, which carries 750 cubic feet of water per second. The other, the Dolores Land and Canal Company's ditch No. 2, has a width of twenty-five feet on the bottom, and a carrying capacity of 600 cubic feet of water per second of time. The amount of land that can be irrigated from these canals is estimated to be from 70,000 to 100,000 acres. A great portion of this land is of the best quality, and, as a whole, it is equal to any in the State in respect to fertility and climatic advantages. On these canals there has already been expended nearly \$500,000. They will be in condition to furnish a large supply of water for the season of 1889. It appears to me that the dividing line between Water Division No. 4 and Water Division No. 5 is very awkwardly drawn. There is a large tract of high mesa land between the Dolores river and the streams lying to the north thereof that can never be utilized except for summer pasturage. If the lines of Water Division No. 4 were so adjusted as to include Dolores river and its tributaries, or so much thereof as lies within the limits of La Plata county, it would be a more equitable division, and more convenient for one superintendent of irrigation than is at present the case.

Trusting that this report will be accepted in lieu of the facts desired, but not possible to secure as yet in this division, I am, sir,

Very respectfully yours,

WILLIAM M. MAY,

*Supt. of Irrigation, Water Division No. 4.*

WATER DISTRICT No. 29.

*Water District No. 29*—No water commissioner has been appointed for this district.

Water District No. 29 consists of all the lands lying in the State of Colorado irrigated from ditches or canals taking water from that part of the San Juan river and its tributaries which lie above the junction of the San Juan river and the Rio Piedra, and including the Rio Piedra.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 29,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1886.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Little Navajo ditch . . . . .	Little Navajo River . . . . .	Oct. 14, 1887	June 20, 1887	9.00	William Confar et al.

## WATER DISTRICTS Nos. 30 AND 32.

*Water District No. 30*—There has been no water commissioner appointed for this district.

Water District No. 30 consists of all lands lying in the State of Colorado irrigated from ditches and canals taking water from that part of the Rio Las Animas and its tributaries which lie in Colorado.

Water District No. 30 is also numbered 32.

## WATER DISTRICT No. 31.

*Water District No. 31*—There has been no water commissioner appointed for this district.

Water District No. 31 consists of all lands in the State of Colorado irrigated from ditches or canals taking water from the Los Piños river and its tributaries which lie in Colorado.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 30,  
ALSO No. 32,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Upper Florida Irrigating ditch . . . . .	Florida river . . . . .	June 7, 1888	May —, 1888	9.00	James Cash et al
Stevens Creek Irrigating ditch . . . . .	Stevens creek . . . . .	June 7, 1888	Spring, 1882	6.00	W. H. Rader et al
Little Creek Irrigating ditch . . . . .	. . . . .	June 7, 1888	April 9, 1888	12.00	James Cash
*Ogden and Florida Mesa High Line Irrigating ditch, (en- largement of Ogden ditch). . . . .	Florida river . . . . .	Dec. 26, 1887	Sept. 28, 1887	300.00	George W. Spencer et al
Dry Creek ditch* . . . . .	Dry and Spring crks . . . . .	June 25, 1888	Mar. 20, 1888	2.00	Robert McNicholas
The Florida Mesa ditch . . . . .	Florida river . . . . .	Nov. 13, 1888	Sept. 29, 1888	150.00	Florida Mesa Ditch Co., J. B. Harper president.

\*This ditch is said to be an enlargement of the old Ogden ditch, which had a capacity of 15.00 cubic feet per second; total capacity seems to be 315 cubic feet per second.

Water District No. 30 is also numbered 32.

## WATER DISTRICT No. 33.

*Water District No. 33*—No water commissioner has been appointed for this district.

Water District No. 33 consists of all lands lying in the State of Colorado irrigated from ditches or canals taking water from the La Plata river and its tributaries, which lie in Colorado.

## WATER DISTRICT No. 34.

*Water District No. 34*—No water commissioner has been appointed for this district.

Water District No. 34 consists of all lands lying in the State of Colorado irrigated from ditches or canals taking water from the Rio Mancos and its tributaries.

A plat of this district, prepared from a survey for the referee of this district, by Blair Burnell, and presented to this department by Mr. S. B. La Grange, referee, is shown in Part II. hereof.



## CHAPTER VI.

## WATER DIVISION No. 5.

*Water Division No. 5, Grand River Division, W. J. Fine, Superintendent of Irrigation.* Appointed February 17, 1888. Residence, Montrose, Colorado.

Water Division No. 5 includes all water districts consisting of lands in the State of Colorado watered by the Grand river and its tributaries, and is named the Grand River Division.

Water districts numbered 28, and 36 to 42, inclusive, and 45, are embraced within this division.

## WATER DISTRICT No. 28.

*Water District No. 28*—No water commissioner has been appointed for this district.

Water District No. 28 consists of all lands irrigated from ditches or canals taking water from the Tomichi and its tributaries.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 28,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO DECEMBER 1, 1888

NAME OF DITCH	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
* The Hellmuth Ditch, No. 1 . . . . .	Tie creek . . . . .	Nov. 30, 1887		2.00	Wendel Hellmuth
* The Hellmuth Ditch, No. 2 . . . . .	West fork Tie creek . . . . .	Nov. 30, 1887		2.00	Wendel Hellmuth
The Gee canal . . . . .	No Name creek . . . . .	Feb. 1, 1888		5.00	George S. Gee
† The Pisel Canal, No. 1 . . . . .	Cochetopa creek . . . . .	Mar. 9, 1888		31.00	Jeremiah Pisel
† The Pisel Canal, No. 2 . . . . .	Cochetopa creek . . . . .	Mar. 9, 1888		31.00	Jeremiah Pisel
‡ Anderson ditch . . . . .	Barrett's gulch . . . . .	June 5, 1888		8.00	E. B. Anderson
‡ Owen-Redden ditch . . . . .	Tomichi creek . . . . .	June 5, 1888		10.00	J. R. Owen et al
‡ The Arch Irrigating ditch . . . . .	Tomichi creek } and Needle creek }	July 18, 1888	Oct. 1, 1887	200.00	Kate L. Arch
¶ Perry Irrigating ditch . . . . .	Cochetopa creek . . . . .	Oct. 25, 1888		12.00	George E. Perry, Charles L. Perry
Los Pinos ditch . . . . .	Los Pinos creek . . . . .	Nov. 3, 1888	Oct. 13, 1888	8.00	N. T. Crary, Mrs. N. T. Crary
** Strachan ditch . . . . .	Los Pinos creek . . . . .	Nov. 17, 1888		37.00	George Strachan, Agnes Forrest
Anderson Ditch, No. 1 . . . . .	Los Pinos creek . . . . .	Nov. 17, 1888	Oct. 17, 1888	5.00	Walter H. Anderson
Anderson Ditch, No. 2 . . . . .	Los Pinos creek . . . . .	Nov. 17, 1888	Oct. 17, 1888	7.00	Walter H. Anderson

\* Said to be completed November 22, 1887.

† Said to be completed March 8, 1888.

‡ Said to be only partially completed June 4, 1888.

§ Said to be completed June 4, 1888.

150.00 cubic feet per second approximated from Tomichi creek, and 50.00 cubic feet per second from Needle creek.

¶ Said to be completed October 24, 1888.

\*\* Surveyed October 16, 1888.

## WATER DISTRICT No. 36.

*Water District No. 36*—No water commissioner has been appointed for this district.

Water District No. 36 consists of all lands irrigated by water taken from the Blue river and its tributaries.

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## WATER DISTRICT No. 37.

*Water District No. 37*—No water commissioner has been appointed for this district.

Water District No. 37 consists of all lands lying in the State of Colorado irrigated by water taken from the Eagle river and its tributaries.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 37,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is taken.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
*The Daggett and Parker ditch.	Gypsum creek . . .	Nov. 25, 1887			O. W. Daggett et al
†. . . . .	South Spring No. 1	April 2, 1888			A. F. Ellison, A. P. Sprankle
†. . . . .	North Spring No. 1	April 2, 1888			A. F. Ellison, A. P. Sprankle
Chalfield ditch . . . . .	Gypsum creek . . .	May 26, 1888			Peter Stein
‡Chalfield ditch, enlargement. . .	Gypsum creek . . .	May 26, 1888	April 1, 1887		V. Anderson, John Strenme
. . . . .	Beaver creek . . .	May 26, 1888	May 18, 1888	4.00	George A. Townsend
Norgaard ditch . . . . .	Gypsum creek . . .	June 9, 1888		7.875	Anna Norgaard, F. M. Skiff
Uline & Company's ditch. . . . .	Gypsum creek . . .	June 13, 1888	Oct. —, 1885	7.00	Ole Uline et al
¶The Bartholemew ditch . . . . .	Gypsum creek . . .	June 27, 1888			W. W. Codey, M. E. Loswell
**H. O. R. ditch. . . . .	Gypsum creek . . .	July 11, 1888			Thomas K. Halsall
††Berry ditch . . . . .	Berry creek . . .	Aug. 27, 1888			Harrison Berry, Jennie Bowen
Stratton & Co. ditch . . . . .	Gypsum creek . . .	Sept. 4, 1888	April —, 1882	35.00	W. E. Stratton et al
Grundell Brothers ditch . . . . .	Gypsum creek . . .	Sept. 14, 1888		6.50	A. T. Grundell, A. W. Grundell
‡‡Grace Park ditch . . . . .	Eagle river. . . . .	Sept. 19, 1888			Charles B. Horn

A. F. Grundell ditch . . . . .	Gypsum creek . . . . .	Sept. 24, 1888	Spring, 1887	1.50	A. F. Grundell
J. W. Dodd ditch . . . . .	Lake creek . . . . .	Nov. 6, 1888			James M. Dodd

\*Built by Daggett & Parker, in 1882; enlarged by W. H. Dunfield, in 1886; enlarged again by Daggett & Shippe, in 1887.

†Two hundred inches claimed.

‡Fifty inches claimed.

§Total capacity seems to be four cubic feet per second.

¶There seems to be an extension of an old ditch.

per second seems also claimed as the increase of capacity occasioned by enlargement.

\*\*Water claimed to have been appropriated May 10, 1888; capacity claimed is 700 inches

††Capacity claimed to be 300 inches, and water to have been appropriated by original construction, July 24, 1884.

‡‡Water claimed to have been appropriated by original construction, July 1, 1888.

§§Water claimed to have been appropriated by original construction, June 20, 1886; capacity claimed is 300 cubic inches.

## WATER DISTRICT No. 38.

*Water District No. 38, Louis Stone, Water Commissioner.* Appointed July 14, 1887. Residence, Aspen, Colorado.

Water District No. 38 consists of all lands lying in the State of Colorado irrigated by waters taken from the Roaring Fork and its tributaries.



# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 38,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work hereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
McKon ditch . . . . .	Four-Mile creek . . .	Sept. 14, 1887	July 23, 1887	4.30	Michael McKon
Lynch ditch . . . . .	Four-Mile creek . . .	Sept. 23, 1887	Sept. 4, 1887	4.30	Patrick Lynch
The Montarch ditch . . . . .	Cattle creek . . . . .	Jan. 26, 1888	July 31, 1885	39.60	David S. James, John A. Hunt
*Needham ditch . . . . .	Cattle creek . . . . .	Feb. 6, 1888	Aug. —, 1884	25.00	James Needham
†Needham ditch, enlargement . . . . .	Cattle creek . . . . .	Feb. 15, 1888			J. M. Lytle et al
‡Thomas Turpin ditch . . . . .	Rock creek . . . . .	Mar. 19, 1888	May 25, 1886	0.03	Thomas Turpin
§The Basalt ditch . . . . .	Roaring Fork . . . . .	May 8, 1888		1.20	W. H. Harris, Charles H. Harris
Lake Park ditch . . . . .	Spring branch . . . . .	May 23, 1888			
*Roaring Fork & Grand River Ditch and Land Co.'s ditch . . . . .	Cattle creek . . . . .	May 24, 1888	Aug. 28, 1885	60.00	Roaring Fork & Grand River Ditch & Land Co., W. H. Bradt, supt. and eng.
**Robertson ditch . . . . .	Roaring Fork . . . . .	July 2, 1888	Feb. 11, 1888		D. C. Robertson et al
††Weaver & Leonhardy ditch . . . . .	Rock creek . . . . .	July 16, 1888	April 20, 1885		P. F. Weaver, J. M. Leonhardy
Wathen ditch . . . . .	Woody creek . . . . .	July 16, 1888	May 10, 1883	3.00	George F. Wathen et al
Strang Ditch No. 1 . . . . .	Mesa creek . . . . .	July 20, 1888	July 2, 1883	2.76	R. D. Strang
Strang Ditch No. 2 . . . . .	Mesa creek . . . . .	July 20, 1888	April 5, 1883	0.41	R. D. Strang
Fonder ditch . . . . .	Cattle creek . . . . .	July 26, 1888	Ab't Ap. 15, '86	1.00	Meriam D. Fonder

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 38—*Concluded.*

NAME OF DITCH	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second	NAME OF CLAIMANT
††Prior ditch . . . . .	{ R. fork Coulter cr. . . }	Aug. 10, 1888	May 10, 1882		R. P. Coulter, et al
‡‡Yank-Edgerton ditch . . . . .	{ West fork Yank creek and Edgerton creek }	Aug. 21, 1888	May 16, 1888	8.35	O. U. Peacott, J. Frontman
The Frank Dearing ditch . . . . .	Four-Mile creek . . . . .	Aug. 16, 1888	Mar. 12, 1888	3.41	Frank D. Dearing
West High Line ditch . . . . .	{ Coulter and Mesa creeks }	Sept. 14, 1888	June 18, 1888	1.90	R. P. Coulter et al
Ralston ditch . . . . .	Coulter creek . . . . .	Sept. 14, 1888	June 21, 1888	2.68	Amos P. Ralston
Hisey Irrigating ditch . . . . .	{ Mesa creek } (Possibly in 42)	Sept. 18, 1888	Aug. 27, 1888	2.88	Jennie B. Hisey
Van Cleve Ditch No. 1 . . . . .	Spring . . . . .	Oct. 13, 1888	Sept. 5, 1882	1.04	P. H. Van Cleve
Van Cleve Ditch No. 2 . . . . .	Spring . . . . .	Oct. 13, 1888	Sept. 15, 1882	2.68	P. H. Van Cleve
Crystal Lake, or Riverside Reservoir Water ditch . . . . .	Roaring Fork river . . . . .	Nov. 27, 1888		13.00	L. D. Sivyey, G. C. Vickery

\*Claims water for irrigation of 160 acres and for domestic use.

†Claim to water dated from September 3, 1886. This seems to be an enlargement of the Needham ditch. Total capacity, 1,000 inches.

‡Capacity claimed is 50 cubic inches per second.

§Ditch said to have been completed on or about May 25, 1883.

||Only a plat filed; no statement. A reservoir shown connected with ditch.

¶This ditch supplies Reservoir No. 1, having a capacity of 150,000 gallons, and Reservoir No. 2, having a capacity of 12,000,000 gallons.

\*\*20 cubic feet of water per second claimed.

††6.00 cubic feet per second of water claimed.

‡‡2.00 cubic feet per second of water claimed.

§§Statement filed August 28, 1888. Plat filed May 21, 1888.

|||This ditch seems intended to supply a reservoir named the Riverside Reservoir, or Crystal Lake.

## WATER DISTRICT No. 39.

*Water District No. 39, John Clark, Water Commissioner.* Appointed February 20, 1888. Residence, Ferguson, Garfield county.

Water District No. 39 consists of all lands lying in the State of Colorado, located on the north side of the Grand river, extending from the mouth of the Roaring Fork to the mouth of the Rhone (Roan) creek; all of said lands being irrigated by waters taken from the Grand river or its tributaries, viz: Elk creek, Rifle creek and Rhone (Roan) creek.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 39,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
*Ward & Hinds ditch . . . . .	Elk creek . . . . .	Aug. 20, 1887	. . . . .	8.50	B. S. Hinds, W. B. Devereaux
Ware-Hinds ditch . . . . .	Elk creek . . . . .	Aug. 22, 1887	July 15, 1887	44.60	H. V. Ware et al
†Moore ditch . . . . .	Garfield creek . . . . .	Sept. 1, 1887	—, 1881	. . . . .	. . . . . C. W. Moore
Parris & Mann ditch . . . . .	Rifle creek . . . . .	Sept. 3, 1887	Aug. 20, 1886	5.70	Richard Parris, John C. Mann
Reynolds-Cain ditch . . . . .	Mitchell creek . . . . .	Sept. 5, 1887	April 19, 1883	9.36	Jo. Reynolds, George B. Cain
Hiltschle ditch . . . . .	Rifle creek . . . . .	Sept. 6, 1887	Nov. 1, 1885	10.80	Herman Hiltschle et al
‡Squier ditch . . . . .	Rifle creek . . . . .	Sept. 9, 1887	May 15, 1886	3.33	Frank D. Squier
Parris, Mann & Hiltschle ditch . . . . .	East Rifle creek . . . . .	Sept. 9, 1887	April —, 1885	7.10	Richard Parris et al
§Wisdom ditch . . . . .	Rifle creek . . . . .	Sept. 19, 1887	—, 1884	36.75	P. Cantwell et al
Pioneer ditch . . . . .	Rifle creek . . . . .	Sept. 20, 1887	Mar. 4, 1884	. . . . .	Henry W. Hallett et al
¶Rifle Creek Cañon ditch . . . . .	Rifle creek . . . . .	Sept. 23, 1887	Dec. 18, 1886	35.89	H. G. Brown et al
**Canary Bird ditch . . . . .	{ East and Center Spring runs. }	Oct. 10, 1887	April —, 1886	0.87	William Helmer
††Cottonwood Creek ditch . . . . .	Cottonwood creek . . . . .	Oct. 10, 1887	Aug. 10, 1887	7.00	John F. Allen
Rusler ditch . . . . .	Porcupine creek . . . . .	Oct. 10, 1887	May 12, 1883	20.00	George H. Starke
‡‡Diamond ditch . . . . .	Parachute creek . . . . .	Oct. 31, 1887	. . . . .	10.90	Henry C. Bussey, Engelbert Rupp

Excelsior ditch . . . . .	Rifle creek . . . . .	Nov. 19, 1887	Dec. —, 1883	10.00	Abram W. Maxfield
§§ Daisy ditch . . . . .	Parachute creek . . . . .	Nov. 28, 1887	May 17, 1883	14.91	Martin H. Street et al
44 Purdy ditch . . . . .	East Fork Elk cr'k . . . . .	Dec. 5, 1887	July —, 1883	4.30	C. O. Pierson, N. B. Nelson
Mace & Nelson ditch . . . . .	Mid. Fork Elk cr'k . . . . .	Dec. 5, 1887	Oct. —, 1884	6.25	C. O. Pierson, N. B. Nelson
Pierson ditch . . . . .	Mid. Fork Elk cr'k . . . . .	Dec. 5, 1887	Dec. —, 1883	11.59	C. O. Pierson et al
Stephen-Meadows ditch . . . . .	Oasis creek . . . . .	Dec. 13, 1887	Mar. 6, 1884	10.38	Paris Meadows, Ella M. Stephenson
West Mesa ditch . . . . .	Oasis creek . . . . .	Dec. 21, 1887	April 1, 1887	8.00	Margaret S. Ferguson, W. H. Royson
G. E. Harris ditch No. 1 . . . . .	West Rifle creek . . . . .	Jan. 4, 1888	Feb. 25, 1887	2.00	Geo. E. Harris
G. E. Harris ditch No. 2 . . . . .	Clear creek . . . . .	Jan. 4, 1888	Dec. 24, 1887	1.50	Geo. E. Harris
Mitchell & Cooper ditch . . . . .	Oasis creek . . . . .	Jan. 13, 1888	April 13, 1885	5.04	W. H. Royston
¶ Roan Creek Ditch No. 2, en- largement . . . . .	Roan creek . . . . .	Jan. 26, 1888	Oct. 20, 1884	5.00	A. A. Williamson
Hudson-Sullivan ditch . . . . .	Garfield creek . . . . .	Feb. 1, 1888	Nov. 15, 1885	5.00	T. D. Hudson, Stephen M. Sullivan
¶¶ M. S. B . . . . .	{ West Garfield or Baldy creek . . . . .	Feb. 13, 1888	May —, 1882	8.00	J. D. Murray et al
Dow ditch . . . . .	{ Baldy or West Br. of Garfield cr'k } . . . . .	Feb. 16, 1888	May 1, 1884	3.38	Andrew Dow
Mace, Nelson & Benson ditch . . . . .	Mid. Fork Elk cr'k . . . . .	Feb. 29, 1888	Jan. 23, 1888	11.20	Charles O. Benson et al
Manning ditch . . . . .	Middle Rifle creek . . . . .	April 28, 1888	May 1, 1886	6.00	John M. Manning
Mullen ditch . . . . .	Middle Rifle creek . . . . .	April 28, 1888	Aug. 15, 1887	8.00	Daniel B. Mullen et al

\* Said to have been completed in July, 1885.  
 † Capacity claimed is 160 cubic inches.  
 ‡ Quantity of water claimed, 5,760 cubic inches.

§ Work said to have been commenced in 1884; that the ditch has been enlarged and extended from time to time and most recently June 20, 1887; 800 statutory inches per second claimed.

¶ Ditch said to have been enlarged and extended from time to time; most recently July 16, 1887; 16.37 cubic feet per second claimed.

¶¶ Amount of water claimed is 31.20 cubic feet per second.

\*\* Capacity given as 1500 cubic inches per second, which is equivalent to 0.87 cubic feet per second.

†† Also called John E. Allen's ditch and Cottonwood ditch.

‡‡ Capacity stated, in cubic inches per second, to be 18,840. Said to have been "located" March 15, 1885.

§§ Capacity stated, in cubic inches per second, to be 25,760.

¶¶ The capacity of said ditch, as enlarged, is 15 cubic feet per second.

¶¶ Amount of water claimed is 5,760 cubic inches per second, which is equivalent to 3.33 cubic feet per second.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 39—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
* Reservoir ditch	Roan creek	May 1, 1888	Feb. 18, 1888	45.00	J. J. Brummitt et al
† The Roan Creek Ditch No. 2, Enlargement	Roan creek	May 7, 1888	Nov. 9, 1886		C. C. Hoppel
‡ Connelly ditch	East Elk creek	May 19, 1888		4.00	Ellen Connelly
Heinzie ditch	Middle Elk creek	June 14, 1888	Feb. 10, 1884	5.50	Herman Heinzie, K. Bonds
Armstrong ditch	Dry Roan creek	June 14, 1888	April 25, 1888	15.30	James S. Armstrong et al
‡ Saint ditch	Dry Frk of Elk crk	June 21, 1888	April 26, 1888	7.40	A. J. Saint, Geo. W. Saint
Carr & Himebaugh ditch	Clear creek	July 26, 1888	April 22, 1887	40.44	John N. Carr, Byron H. Himebaugh
McGonegal ditches, east branch	Middle Rifle creek	July 26, 1888	Feb. 24, 1888	2.00	James McGonegal
McGonegal ditches, west branch	Middle Rifle creek	July 26, 1888	Feb. 24, 1888	2.00	James McGonegal
‡ Mountain Boy ditch	— creek	July 26, 1888	Oct. 1, 1884	2.00	James McGonegal
* Rifle Creek Cañon Ditches, No. 1, Watson enlargement	Rifle creek	Aug. 13, 1888	Feb. 28, 1888	2.67?	Benjamin K. Watson
** Rifle Creek Cañon Ditch No. 2, Watson enlargement	Rifle creek	Aug. 13, 1888	Feb. 28, 1888	2.67?	Benjamin K. Watson
†† Clinetop ditch	East Elk creek	Aug. 29, 1888	April 15, 1888	0.046	Sarah Clinetop
Rulison ditch	Lit. Cottonwood cr.	Aug. 10, 1888	May 4, 1887	4.20	Charles M. Rulison
Lower Cactus Valley ditch	Grand river	Oct 25, 1888	Sept. 24, 1888	27.75	{ The Lower Cactus Valley Ditch Co., by C. H. Stobaugh.

\* A reservoir is connected with this ditch, the particulars of which are not given.



† The carrying capacity of said ditch, as enlarged, is 18.00 cubic feet per second.

‡ Said ditch was originally constructed in July, 1884; was enlarged in 1885 and 1886. The capacity given is the present capacity of ditch.

§ The Waters of Dry Fork of Elk creek, supplying this ditch, pass first through Saint Reservoirs Nos. 1 and 2.

¶ Statement not sufficiently explicit to indicate with certainty the district in which this ditch is situated.

\* Said to have been "located" August 4, 1886; said to have an increase of capacity of 3.00 cubic feet per second for 108 feet, after which increase of capacity is .43 of a cubic foot per second.

\*\* The total capacity of this ditch is 8.00 cubic feet per second.

†† Capacity said to be 80 cubic inches per second, which is the equivalent of the capacity given in cubic feet per second.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 39,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet	NAME OF CLAIMANT.
Saint Reservoir No. 1.	{ Dry Fork of Elk creek. }		June 21, 1888	April 26, 1888	1,100,000	A. J. Saint, Geo. W. Saint
Saint Reservoir No. 2.	{ Dry Fork of Elk creek. }		June 21, 1888	April 26, 1888	290,000	
Ormundson and Frost Reservoir . . . . .	{ Dry Fork of Roan creek }	Feeder ditch	Aug. 11, 1888	Aug 6, 1888	576,000	A. T. Ormundson, Daniel Frost

## WATER DISTRICT No. 40.

*Water District No. 40—Frank R. Ross, Water Commissioner.* Appointed August 1, 1887. Residence, Hotchkiss, Delta county, Colorado.

Water District No. 40 consists of all lands irrigated from ditches or canals taking water from Crystal creek and Smith's Fork and their tributaries, and so much of all the lands lying within the boundaries of Delta county as are irrigated from the ditches or canals taking water from the Gunnison river and its tributaries, except lands irrigated from ditches or canals taking water from the Uncompaghre river.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 40,  
RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Buckland ditch . . . . .	Current creek . . . . .	Nov. 2, 1887	Aug. 2, 1887	3.00	George E. Buckland
*Sayer ditch . . . . .	Sayer's gulch . . . . .	Nov. 21, 1887	Aug. 20, 1887		Henry Sayers
†Mount Lambert ditch . . . . .	West fork of Bell ( crk. and Bell crk. )	Nov. 21, 1887	Aug. 18, 1887	5.00	A. A. Smith, Henry Sayers
‡The Daisy ditch . . . . .	Smith's fork . . . . .	Jan. 23, 1888			
Lone Rock ditch . . . . .	Smith's fork . . . . .	Feb. 27, 1888			
Buckley ditch . . . . .	Current creek . . . . .	Mar. 24, 1888	Jan. 1, 1888	10.00	Stephen F. Buckley
‡Perkins ditch, enlargement . . . . .	Forked Tongue crk . . . . .	April 2, 1888	Feb. 1, 1888	3.00	George Fogg, John Mundy
Hice Ditch Company's ditch . . . . .	Smith's Fork creek . . . . .	July 19, 1888			N. M. Heistand et al
*Needle Rock ditch, enlargement and extension of Hice ditch . . . . .	Smith's Fork creek . . . . .	Aug. 22, 1888	April 20, 1888	35.00	John Hunter et al

\*Sayer's reservoir is connected therewith.

†Four cubic feet per second claimed from west fork of Bell creek and one cubic foot per second claimed from Bell creek. Water carried for a portion of its course through A. A. Smith's ditch.

‡Scams intended to furnish water to George H. Young et al.

‡Carrying capacity before enlargement, eight cubic feet per second; after enlargement, eleven cubic feet per second; original construction began on March 1, 1884.

¶The Hice ditch is said to have been commenced about January 1, 1883, and to have had a capacity estimated at fifteen cubic feet per second. The capacity is said to have been increased by this enlargement thirty-five cubic feet per second.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 40,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
Sayers' reservoir	Sayers' gulch		Nov. 21, 1887	Aug. 20, 1887	200,000	Henry Sayers
The Trickel Park reserv'r.	Surface creek		Nov. 26, 1888	June 21, 1887	24,000,000	John H. Burton, Robert Trickel, Wil- ham M. Spalding.

## WATER DISTRICT No. 41.

*Water District No. 41.*—*David A. Callaway, Water Commissioner.* Appointed July 28, 1888. Residence, Montrose, Colorado.

Water District No. 41 consists of all lands irrigated from ditches or canals taking water from the Uncompahgre river and its tributaries, except so much as are within the boundary lines of Ouray county.



## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 41,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
* Purdy and Vickers ditch, Buck- land's enlargement . . . . .	Uncompahgre river	Sept. 22, 1887	Feb. 9, 1886	5.00	Geo. E. Buckland
† Garnet ditch . . . . .	. . . . .	Dec. 22, 1887	Sept. 2, 1887	26.00	{ The Garnet Reservoir Company, O. T. Standish, president.
The Rustler ditch . . . . .	Uncompahgre river	May 16, 1888	Feb. 18, 1888	46.67	{ The Rustler Ditch and Reservoir Com- pany, S. H. Anderson, president.
Mexican Gulch Irrigating ditch . . . . .	Mexican gulch . . . . .	July 30, 1888	June 25, 1888	17.00	David Wood

\* Capacity before enlargement, 15 cubic feet per second.

† A reservoir is connected therewith.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT NO. 41,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS  
TO DECEMBER 1, 888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
Garnet reservoir	Uncompahgre river.	Garnet ditch	Dec. 22, 1887	Sept. 2, 1887	5,488,560	{ The Garnet Reservoir Company, O. T. Standish, president.

## STATEMENT CONCERNING ARTESIAN WELLS IN WATER DISTRICT No. 41,

RELATIVE TO WHICH STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF OWNERS OF WELL.	Total depth thereof.	Diameter of case, (in inch- es)	Length of case, (in feet).	DEPTH OF FLOW BE- LOW SURFACE.				LOCATION.	Present flow in gallons per minute.
				First flow.	Second flow.	Third flow.	Fourth flow.		
* Geo. Smith, L. N. Hill . . . . .	800	5 $\frac{5}{8}$	700	700	. . .	. . .	700	{ Sec. 27, Tp. 49, R. N. W. Montrose county.	35
† Town of Montrose . . . . .	936	5 $\frac{5}{8}$	600	800	. . .	. . .	800	{ Sec. 34, Tp. 49, R. 9, Mon- trose county.	27

† Montrose Artesian Well No. 1.

\* Montrose Artesian Well No. 2.

## WATER DISTRICT No. 42.

*Water District No. 42—Fred. W. Halbauer, Water Commissioner.* Appointed July 23, 1888. Post-office address, Grand Junction, Mesa county, Colorado.

Water District No. 42 consists of all lands irrigated from ditches or canals taking water from the Grand and Gunnison rivers and their tributaries in Mesa county.

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 42,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
R. & A. G. Anderson ditch . . . .	Cache creek . . . .	Aug. 4, 1887	July 15, 1887	10.00	. . . . . R. Anderson, A. G. Anderson
Martin & Kennedy ditch . . . .	Cache creek . . . .	Aug. 6, 1887	July 27, 1887	6.70	. . . . . E. A. Martin, William P. Kennedy
*Holmes ditch. . . . .	Cache creek . . . .	Aug. 12, 1887	Sept. 15, 1884	15.00	. . . . . Robert Holmes et al
O'Brien & Baumgartner ditch . .	Cache creek . . . .	Aug. 13, 1887	July 31, 1887	10.40	. . . . . John O'Brien, John Baumgartner
The Harding ditch . . . . .	Cache creek . . . .	Sept. 1, 1887	April 15, 1884	20.93	. . . . . Charles Harding et al
Mason & Eddy ditch . . . . .	Mesa creek. . . . .	Sept. 24, 1887	Nov. —, 1884	5.76	. . . . . John F. Mason, James Eddy
Mesa Creek ditch . . . . .	Mesa creek. . . . .	Sept. 26, 1887	Oct. —, 1883	20.16	. . . . . J. P. Brown et al
West Side ditch . . . . .	Mesa creek. . . . .	Sept. 26, 1887	July 10, 1886	11.52	. . . . . William Ditman et al
Independent Irrigating ditch . .	Mesa creek. . . . .	Oct. 7, 1887	May —, 1885	9.36	. . . . . A. R. Craig et al
Camp Bird ditch . . . . .	Cache creek . . . .	Oct. 10, 1887	April 15, 1883	14.00	William H. Wilkinson, John Wilkinson
*Mocking Bird ditch . . . . .	Cache creek . . . .	Oct. 10, 1887	June 1, 1886	1.134	. . . . . Francis M. Dyer
Jay Bird ditch. . . . .	Cache creek . . . .	Oct. 10, 1887	Aug. 2, 1886	11.00	. . . . . Mary J. Murphy, F. M. Dyer
Humming Bird ditch . . . . .	Cache creek . . . .	Oct. 10, 1887	Mar. 21, 1887	9.00	. . . . . William W. Weld
Blue Bird ditch . . . . .	Cache creek . . . .	Nov. 19, 1887	Sept. 28, 1887	7.00	. . . . . Alfred H. Schultz

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 42—Continued.

NAME OF DITCH	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Hall Irrigating ditch . . . . .	Cottonwood creek . . . . .	Dec. 7, 1887	Nov. 25, 1886	5.76	Morgan Hall, Annie E. Hall
Suipes Irrigating ditch . . . . .	Cottonwood creek (Big creek, a tributary of Plateau creek.) . . . . .	Dec. 19, 1887	Aug. 20, 1887	5.76	J. N. Suipes
Big Creek ditch . . . . .	Plateau creek . . . . .	Dec. 28, 1887	June 1, 1887	6.00	J. Trowbridge Bailey
Washburn & Downing Irrigating ditch . . . . .	Kannah creek . . . . .	Jan. 26, 1888	Feb. 15, 1882	8.40	J. W. Washburn, George S. Downing
Hawxhurst Irrigating ditch . . . . .	Br. of Buzzard crk . . . . .	Jan. 26, 1888	Jan. 2, 1883	8.64	George Hawxhurst et al
Mormon Mesa ditch . . . . .	Cottonwood creek . . . . .	Jan. 26, 1888	Nov. 20, 1885	23.00	A. D. Mason et al
Rockwell & Needles ditch . . . . .	Grove creek . . . . .	Mar. 2, 1888	May —, 1883	6.00	Fred. S. Rockwell, W. C. Needles
Palmer ditch . . . . .	Big, or Clear-water creek. } . . . . .	Mar. 22, 1888	Aug. 16, 1883		Asa Palmer et al
Texas ditch . . . . .	Big creek. . . . .	Mar. 22, 1888	July 28, 1883		C. K. Palmer, Mary C. Palmer
Pioneer of Plateau ditch . . . . .	Bull creek. . . . .	April 23, 1888	Mar. —, 1883	8.64	A. K. Hampton et al
The Colorado and Utah High Line Canal . . . . .	Grand river . . . . .	April 26, 1888	April 11, 1888	2000.00	Albert A. Miller et al
Escalanti Irrigating ditch . . . . .	Escalanti creek . . . . .	April 28, 1888	Jan. 30, 1888	6.50	Herbert Timmins
Stuart Irrigating ditch . . . . .	Bull creek . . . . .	May 1, 1888	Nov. 5, 1887	2.88	C. A. Stuart
Unaweeep ditch . . . . .	East creek . . . . .	June 14, 1888	April 1, 1887	2.60	F. M. Anderson
Larkin ditch . . . . .	Grand river. . . . .	June 15, 1888		19.50	John Larkin et al
Arkansas Irrigating ditch . . . . .	Mesa creek. . . . .	July 5, 1888	June —, 1885	14.00	W. F. Barnes
Mesler ditch No. 1 . . . . .		Aug. 6, 1888	April 1, 1886	1.50	Orlando A. Mesler



¶ Mesler Ditch No. 2		Aug. 6, 1888	April 1, 1886	1.50	Orlando A. Mesler
*McCabe ditch	{ Hay Canoro, trib. of viaduct East Salt creek. }	Aug. 13, 1888	June 10, 1887		Curtis J. McCabe
Silver Gauge ditch	Big creek	Aug. 14, 1888	Nov. 1, 1886	20.16	{ Silver Gauge Ditch Association, Jonathan Hodgson et al. }
The Wildcat ditch	Big creek	Aug. 14, 1888	April 25, 1885	20.16	{ The Wildcat Ditch Association, William Stiter, secretary, et al. }
Juniata ditch	Kannah creek	Aug. 14, 1888	Jan. 7, 1884	21.25	{ The Juniata Ditch Association, R. H. Day, president. }
Willow Creek Irrigating ditch	Willow creek	Aug. 25, 1888	June 10, 1884	3.00	J. F. Brink
Murray Irrigating ditch	Grove creek	Aug. 25, 1888	April —, 1887	3.00	George C. Murray
*Cook Irrigating ditch, enlarged and extended	Kimball creek	Sept. 1, 1888	Aug. 6, 1888		John Durant, James J. Mattingly
Berthoff, Latham & Updyke ditch	Big creek	Sept. 1, 1888	Mar. 12, 1888	20.00	J. M. Berthoff et al
Coon Creek ditch	Coon creek	Sept. 1, 1888	May 15, 1886	2.88	J. J. Long
Coakley & Kiggins Irrigating ditch	Big creek	Sept. 3, 1888	Aug. 18, 1888	8.64	Ervin S. Coakley et al
The Dunlap ditch	{ North fork of Bizzard creek. }	Sept. 3, 1888	Abt. Apr. 1, '84	8.00	Edward C. Dunlap
Hisey Irrigating ditch	Mesa creek	Sept. 18, 1888	Aug. 27, 1888	2.88	Jennie B. Hisey
King Irrigating ditch	Mesa creek	Sept. 18, 1888	Nov. 15, 1887	11.2	J. M. King et al
Davenport Irrigating ditch	Cottonwood creek	Sept. 18, 1888	Aug. —, 1887	8.64	John Davenport et al
†Mormon Mesa, enlarg. thereof	Cottonwood creek	Sept. 18, 1888	Aug. 30, 1888		L. M. Miller
The Shotwell Irrigating ditch	Cottonwood creek	Sept. 18, 1888	April 25, 1888	2.88	J. S. Shotwell
Ranaga & Roberts ditch	Beaver creek	Sept. 18, 1888	Aug. 27, 1888	5.76	J. R. Canaga, William H. Roberts
Blackman, Dunlage & Clark Irrigating ditch	Plateau creek	Sept. 26, 1888	Sept. 6, 1888	7.00	Daniel Blackman et al

\*Dry bed of Cottonwood creek is used as a part of the ditch. A small reservoir is platted in connection with this ditch.

†1,960 cubic inches per second claimed; 1,134 cubic feet per second secured.

‡Sufficient to irrigate 240 acres of land, is said to be capacity of ditch.

¶This ditch is said to draw water from the Grand River ditch lateral.

\*This ditch is said to draw water from the Grand River ditch lateral. Capacity claimed is 100 inches. Head extended up stream in summer of 1888. One cubic foot per second of water of that cañon claimed.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 12—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Atwell Irrigating ditch, enlargement thereof . . . . .	Mesa creek . . . . .	Sept. 26, 1888	Aug. 29, 1888	2.88	John Atwell
East Creek ditch . . . . .	East creek . . . . .	Sept. 26, 1888	April —, 1883	2.60	John Goldsby
Park View ditch . . . . .	Cottonwood creek . . . . .	Sept. 26, 1888	Aug. 27, 1888	2.88	J. F. Boyle
McGeoch Irrigating ditch . . . . .	Coon creek . . . . .	Sept. 26, 1888	July 10, 1888	2.88	Joseph W. McGeoch
Atwell Irrigating ditch . . . . .	Coon creek . . . . .	Sept. 28, 1888	Aug. 29, 1888	5.76	Charles H. Atwell, W. J. McAfee
The Oakland ditch . . . . .	Lemmex creek . . . . .	Sept. 29, 1888	June 10, 1888	4.00	Eugene Lemmex
The Parkinson ditch . . . . .	Plataan creek . . . . .	Sept. 29, 1888	Sept. 21, 1888	3.00	Ed. H. Parkinson
‡Grove Creek Ditch Co.'s Ditch No. 1, enlargement . . . . .	Grove creek . . . . .	Oct. 6, 1888	Aug. 15, 1888	3.00	Cornelia Young et al
‡The enlargement of the Coakley & Kiggins ditch . . . . .	Big creek . . . . .	Oct. 6, 1888	Sept. 6, 1888		John F. Williams
The Mariner Irrigating ditch . . . . .	Mesa creek . . . . .	Oct. 6, 1888	Aug. 29, 1888	2.88	Mariner Cook
The Johnson & Stewart ditch . . . . .	Big creek . . . . .	Oct. 6, 1888	June —, 1884	5.76	Timothy C. Johnson, James Stewart
‡The Pioneer of Plataan ditch, enlargement . . . . .	Bull creek . . . . .	Oct. 6, 1888	Aug. 14, 1888		James M. Williams
Spurlock ditch . . . . .	Tate creek . . . . .	Oct. 15, 1888	Aug. 28, 1888	2.88	James Spurlock

\* The carrying capacity of the ditch as enlarged is 10 cubic feet per second.

† Capacity as enlarged is 26 cubic feet per second.

‡ 320 statutory inches claimed.

‡ Original capacity 7.00 cubic feet per second. Capacity as enlarged, 10 cubic feet per second.

‡ Capacity as enlarged, 11.52 cubic feet per second.

‡ Capacity as enlarged is 11.52 cubic feet per second.

## WATER DISTRICT No. 45.

*Water District No. 45—James Tallmadge, Water Commissioner.* Appointed July 14, 1887. Residence, Chapman, Garfield county.

Water District No. 45 consists of all lands situated on the south side of the Grand river, and irrigated from ditches or canals taking water from the Grand river and its tributaries, between the mouth of the Roaring Fork river and the south line of Mesa county.

Water District No. 45 was established July 14, 1887, by the Governor, in compliance with a petition from the residents of that portion of the State.

Mr. Tallmadge furnished a very fine plat of his water district, which it was not possible to introduce into the report, but which is on file in this office, where it can be examined.

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 45,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
*Gibson & Jackson ditch	East Divide creek	Dec. 17, 1887	July 9, 1887	20.00	James R. Gibson
Spring Creek ditch	Peter Churchfield	Dec. 17, 1887	May —, 1886	5.00	Peter Churchfield
†Nuckolls ditch	East Mann creek	Dec. 20, 1887		4.17	Emmit Nuckolls
‡Nuckolls ditch, enlargement	East Mann creek	Dec. 20, 1887	May 1, 1885		George W. Sager
Sliding ditch	Mann creek	Dec. 24, 1887	April 15, 1887	3.50	William Weakly, Bert Ellis
Rippler ditch	East Mann creek	Dec. 24, 1887	Sept. 4, 1887	6.00	S. L. Lewis
‡Last Chance ditch	Grand river	Jan. 19, 1888		15.00	George W. Arnold et al
Boulton & Bauta ditch	Mann creek	Jan. 31, 1888	April 1, 1886	3.00	J. E. Bauta, J. J. Boulton
Ward & Reynolds ditch	Divide creek	Feb. 17, 1888	Jan. 1, 1886	4.10	J. C. Ward, John I. Ward
Ferguson ditch	Grand river	Feb. 17, 1888	April 1, 1882	7.00	George Ferguson
Gove Enlargement ditch	Battlement creek	April 28, 1888	Jan. 28, 1888		James Gove et al
*Cedar ditch	{ Battlement creek thro. R. F. ditch }	April 28, 1888	Mar 7, 1887	10.00	C. L. Hayward, B. B. Good
**Wood & Smythe ditch	{ Battlement creek thro. R. F. ditch }	April 28, 1888	Mar. 6, 1888	8.00	F. F. Wood, James R. Smythe
Ward Extension ditch, enlarge- ment and extension of Mus- conetcong ditch	Battlement creek	May 3, 1888	April 6, 1888	4.00	John W. Ward
O'Connor ditch	Porcupine creek	June 2, 1888	July 25, 1885	3.00	James O'Connor

Huntley Enlargement ditch	Battlement creek	June 2, 1888	April 12, 1888	3.41	W. A. Huntley
Smith and Neve ditch	Beaver creek	June 4, 1888	Feb. 26, 1887	14.00	Benjamin S. Soutle, John Neve
†† J. W. Smith, or Smith ditch	Beaver creek	June 8, 1888	Nov. 20, 1886	2.50	J. W. Smith
†† Richards enlargement of the Smith and Neve ditch	Beaver creek	June 30, 1888	April 11, 1888	3.00	Charles P. Richards
The Battlement ditch	Battlement creek	Aug. 4, 1887	April 15, 1884	30.00	George H. Derbyshire et al.
The Shutt ditch	Battlement creek	Aug. 6, 1887	June 1, 1887	8.80	G. W. Shutt, C. D. Shutt
The R. F. ditch	Battlement creek	Aug. 9, 1887	Nov. 25, 1885	10.00	Robert Fitzimmons, Edward G. Malins
Huntley ditch	Battlement creek	Aug. 22, 1887	Aug. 2, 1887	8.50	C. M. Clark et al.
The Hewitt E. Milburn ditch	Battlement creek	Sept. 1, 1887	Aug. 9, 1886	16.35	George Hewitt, Isaac Milburn
Mill ditch	Beaver creek	Sept. 1, 1887	July 18, 1887	5.30	Albert Hill
Porter ditch	West Divide creek	Sept. 19, 1887	Oct. 15, 1885	31.33	Porter Ditch and Reservoir Company, Wm. Hall, Pres.
Emanuel Grant ditch	West Mann creek	Sept. 26, 1887	Oct. 25, 1885	4.30	Emanuel Grant
Hunter and Grant ditch	West Mann creek	Sept. 26, 1887	April 26, 1884	8.60	James T. Hunter, Johnathan Grant
Goodenough ditch	Beaver creek	Oct. 10, 1887	Sept. 28, 1887	6.00	George H. Starke
Beaver creek ditch	Beaver creek	Oct. 10, 1887	Sept. 28, 1887	7.00	George H. Starke
* Divide Creek ditch	Divide creek	Oct. 10, 1887		3.53	John M. Springer et al.
Cedar Grove ditch	Battlement creek	Nov. 19, 1887	June 8, 1887	12.00	Ada Lackler
Musconetcong ditch	Battlement creek	Nov. 19, 1887	April 15, 1887	12.00	George Parmenter
Clarkson ditch	Grand creek	Nov. 19, 1887	April 15, 1884	10.00	George F. Clarkson
Buffalo ditch	Beaver creek	Dec. 17, 1887	May 1, 1884	12.00	Patrick Egan
Mountain Sheep ditch	Beaver creek	Dec. 17, 1887	Nov. 24, 1887	10.00	Patrick Egan
†† Richards Enlargement and Extension ditch		Aug. 16, 1888	April 11, 1888	2.40	Charles P. Richards

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 45—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
††† Mamm Mountain ditch . . . . .	Bear creek . . . . .	Aug. 16, 1888	April 20, 1888	18.37	William L. Weakly et al.
Last Resort ditch . . . . .	Buzzard creek . . . . .	Sept. 27, 1888	June 25, 1888	5.00	S. L. Lewis et al.

\* Plat shows only one ditch, designated Gibson and Talmadge ditch.

† Work completed May 1, 1884.

‡ Capacity as enlarged, 8.75 cubic feet per second; four cubic feet per second claimed.

§ Fourteen thousand four hundred cubic inches per second claimed.

|| Seems to be an enlargement of the Huntley ditch, and to supply the branches therefrom of James Cove, George M. Siprelle and Peter Carney, with five cubic feet per second each.

¶ This seems to be an enlargement of the R. F. ditch.

\*\* Draws water from R. F. ditch.

†† Two cubic feet per second claimed.

‡‡ Original capacity fourteen cubic feet per second; increase, three cubic feet per second.

§§ Amount of water claimed is 4.27 cubic feet per second.

||| Amount of water claimed is 6,928.5 cubic inches per second.

¶¶ Amount of water claimed is 13,857 cubic inches per second.

\*\* Six thousand cubic inches per second claimed.

†† Said to take water from the Neve and Smith ditch.

‡‡ A small reservoir shown on plat, but not described.



# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 45.

THE FOLLOWING TABULATED STATEMENT RELATING TO THE DITCHES IN WATER DISTRICT NO. 45 IS PREPARED FROM A COPY OF THE DECREE GOVERNING THE APPROPRIATIONS OF WATER IN THIS DISTRICT, FURNISHED THIS OFFICE BY MR. E. T. TAYLOR, REFEREE.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water per second decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second previously appropriated in district.	Order of priority in district.
The Murray & Yule ditch.	Garfield creek	June 10, 1881	2.83		0.00	1
The William Gant ditch	Divide creek	May 25, 1882	.25		2.83	2
The Moore ditch	Garfield creek	June 15, 1882	.25		3.08	3
The East Divide Creek ditch	Divide creek	Aug. 1, 1882	4.00		3.33	4
The William H. Reynolds ditch.	Divide creek	Sept. 19, 1882	.17		7.33	5
The Clausen & Byrne ditch.	Porcupine creek	Mar. 1, 1883	1.00		7.50	6
The Camp Bird ditch	Cache creek	Mar. 15, 1883	5.58		8.50	7
The Clausen ditch	Beaver creek	Mar. 30, 1883	1.83		14.08	8
The Little Nuckolls ditch.	Maum creek.	April 5, 1883	.11		15.91	9
The William Gant ditch, first enlargement.	Divide creek	May 1, 1883	1.88	1.83	16.02	10
The Murray & Yule ditch, first enlargement.	Garfield creek	May 2, 1883	1.50	4.33	17.60	11
The Dow ditch	Garfield creek	May 5, 1883	1.20		19.10	12

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 45.—(Continued.)

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.			Summation of decrees to each ditch, canal or reservoir.	Cubic feet per sec. previously appropriated in district.	Order of priority in district.
			ter per second	decreed to each	priority.			
The Rustler ditch . . . . .	Porcupine creek . . . . .	May 12, 1883	1.33	.	.	.	20.30	13
The Moore ditch, first enlargement . . . . .	Garfield creek . . . . .	June 1, 1883	1.58	.	.	1.83	21.63	14
The Clear Creek ditch . . . . .	Divide creek . . . . .	Nov. 8, 1883	1.00	.	.	.	23.21	15
The Rising Sun ditch . . . . .	Grand river . . . . .	Dec. 5, 1883	3.33	.	.	.	24.21	16
The Mann Creek ditch . . . . .	Mann creek . . . . .	Mar. 10, 1884	1.67	.	.	.	27.54	17
The Starke ditch . . . . .	Beaver creek . . . . .	Mar. 26, 1884	.91	.	.	.	29.21	18
The Nuckolls ditch . . . . .	Mann creek . . . . .	April 3, 1884	3.08	.	.	.	30.12	19
The Ward & Reynolds ditch . . . . .	Divide creek . . . . .	April 3, 1884	1.00	.	.	.	33.20	20
The Murray & Yule ditch, second enlargement . . . . .	Garfield creek . . . . .	April 25, 1884	4.00	8	33	.	34.20	21
The Hunter & Gant ditch . . . . .	Mann creek . . . . .	April 26, 1884	6.25	.	.	.	38.20	22
The Buffalo ditch . . . . .	Beaver creek . . . . .	May 2, 1884	.83	.	.	.	44.45	23
The Boulton & Banta ditch . . . . .	Mann creek . . . . .	May 22, 1884	.83	.	.	.	45.28	24
The Battlement ditch . . . . .	Battlement creek . . . . .	June 12, 1884	1.66	.	.	.	46.11	25
The Dow ditch, first enlargement . . . . .	Garfield creek . . . . .	June 15, 1884	1.80	4	00	.	47.77	26
The Harding & Simerl ditch . . . . .	Cache creek . . . . .	Nov. 20, 1884	2.00	.	.	.	49.59	27

The Huntley ditch . . . . .	Battlement creek . . . . .	Mar. 1, 1885	1.67	. . . . .	51.57	28
The Clear Creek ditch, first enlargement . . . . .	Divide creek . . . . .	April 28, 1885	2.33	3.33	53.24	29
The Nuckolls ditch, first enlargement . . . . .	Mamm creek . . . . .	May 1, 1885	2.00	5.08	55.57	30
The East Divide Creek ditch, first enlargement . . . . .	Divide creek . . . . .	May 15, 1885	6.00	10.00	57.59	31
The Ward & Reynolds ditch, first enlargement . . . . .	Divide creek . . . . .	May 17, 1885	2.00	3.00	63.57	32
The Battlement ditch, first enlargement . . . . .	Battlement creek . . . . .	June 1, 1885	6.67	8.33	65.57	33
The Taughinbaugh ditch . . . . .	Beaver creek . . . . .	July 28, 1885	1.50	. . . . .	72.24	34
The Holmes ditch . . . . .	Cache creek . . . . .	Aug. 2, 1885	1.66	. . . . .	73.74	35
The Tallmadge & Gibson ditch . . . . .	Divide creek . . . . .	Aug. 14, 1885	6.20	. . . . .	75.40	36
The J. A. Clarke ditch . . . . .	Beaver creek . . . . .	Sept. 5, 1885	2.00	. . . . .	81.60	37
The Homestake ditch . . . . .	Wallace creek . . . . .	Oct. 8, 1885	1.33	. . . . .	83.60	38
The Porter ditch . . . . .	Divide creek . . . . .	Oct. 15, 1885	3.42	. . . . .	84.93	39
The Upper Mamm Creek ditch . . . . .	Mamm creek . . . . .	Oct. 20, 1885	2.17	. . . . .	88.35	40
The Emanuel Gant ditch . . . . .	Mamm creek . . . . .	Oct. 25, 1885	2.75	. . . . .	90.54	41
The West Divide Creek ditch . . . . .	Divide creek . . . . .	Nov. 2, 1885	5.17	. . . . .	93.27	42
The Hudson & Sullivan ditch . . . . .	Garfield creek . . . . .	Nov. 15, 1885	3.00	. . . . .	98.44	43
The R. F. ditch . . . . .	Battlement creek . . . . .	Nov. 25, 1885	2.00	. . . . .	101.44	44
The Teepe ditch . . . . .	Mamm creek . . . . .	Mar. 14, 1886	1.58	. . . . .	103.44	45
The O'Brien Feeder ditch . . . . .	Gulch . . . . .	Mar. 15, 1886	3.00	. . . . .	105.02	46
The Lonis Reynolds ditch . . . . .	Divide creek . . . . .	Mar. 26, 1886	.67	. . . . .	108.02	47
The Canary Bird ditch . . . . .	Spring Run gulch . . . . .	April 1, 1886	1.00	. . . . .	108.69	48
The Tallmadge & Gibson ditch, first enlargement . . . . .	Divide creek . . . . .	April 10, 1886	5.25	11.45	109.64	49

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 45—Continued.

NAME OF DITCH, CANAL, OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per second appropriated in district.	Order of priority in district.
The Sliding ditch . . . . .	Maum creek . . . . .	April 23, 1886	1.17	.	114.94	50
The Maum Creek ditch, first enlargement . . . . .	Maum creek . . . . .	May 1, 1886	3.33	5.00	116.11	51
The Spring Creek ditch . . . . .	Spring creek . . . . .	May 14, 1886	2.00	.	119.44	52
The Cottonwood Gulch ditch . . . . .	Cottonwood gulch . . . . .	May 15, 1886	5.83	.	121.44	53
The Ward, Dow & Taylor ditch . . . . .	Garfield creek . . . . .	May 25, 1886	2.08	.	127.27	54
The Mocking Bird ditch . . . . .	Cache creek . . . . .	June 2, 1886	.50	.	129.35	55
The Clausen & Byrne ditch, first enlargement . . . . .	Porcupine creek . . . . .	June 20, 1886	.50	1.50	129.85	56
The Holmes ditch, first enlargement . . . . .	Cache creek . . . . .	June 27, 1886	7.08	8.74	139.35	57
The Young, Mackey & O'Connor ditch . . . . .	Porcupine creek . . . . .	July 7, 1886	6.17	.	137.43	58
The Jay Bird ditch . . . . .	Cache creek . . . . .	Aug. 2, 1886	1.00	.	143.60	59
The Hewitt & Milburn ditch . . . . .	Battlement creek . . . . .	Aug. 9, 1886	4.75	.	144.60	60
The Harding & Simerl ditch, first enlargement . . . . .	Cache creek . . . . .	Nov. 1, 1886	2.33	4.33	149.35	61
The Mocking Bird ditch, first enlargement . . . . .	Cache creek . . . . .	Nov. 14, 1886	1.83	2.33	151.68	62
The Smith ditch . . . . .	Beaver creek . . . . .	Nov. 20, 1886	1.17	.	153.51	63
The Rising Sun ditch, first enlargement . . . . .	Grand river . . . . .	Dec. 1, 1886	8.50	11.83	154.68	64

The Smith & Neve ditch . . . . .	Beaver creek . . . . .	Feb. 26, 1887	5.00	163.18	65
The Taughlinbaugh ditch, first enlargement . . . . .	Beaver creek . . . . .	Mar. 3, 1887	8.50	168.18	66
The R. F. ditch, first enlargement . . . . .	Battlement creek . . . . .	Mar. 7, 1887	4.75	176.68	67
The Huntley ditch, first enlargement . . . . .	Battlement creek . . . . .	Mar. 10, 1887	4.50	181.45	68
The Harding & Simerl ditch, second enlargement . . . . .	Cache creek . . . . .	Mar. 10, 1887	3.69	185.05	69
The Anderson ditch . . . . .	Spring Cañon creek . . . . .	Mar. 15, 1887	1.00	189.64	70
The Musconetcong ditch . . . . .	Battlement creek . . . . .	Mar. 20, 1887	2.42	190.64	71
The Humming Bird ditch . . . . .	Cache creek . . . . .	Mar. 21, 1887	1.00	193.06	72
The Last Chance ditch . . . . .	Grand river . . . . .	Mar. 23, 1887	50.00	194.06	73
The Hudson & Sullivan ditch, first enlargement . . . . .	Garfield creek . . . . .	April 1, 1887	1.67	244.06	74
The Mamm Creek ditch, second enlargement . . . . .	Mamm creek . . . . .	April 8, 1887	6.17	245.73	75
The Clausen & Byrne ditch, second enlargement . . . . .	Porepine creek . . . . .	April 15, 1887	2.75	251.90	76
The Louis Reynolds ditch, first enlargement . . . . .	Divide creek . . . . .	April 19, 1887	.83	254.65	77
The Sliding ditch, first enlargement . . . . .	Mamm creek . . . . .	April 21, 1887	1.17	255.48	78
The Boulton & Banta ditch, first enlargement . . . . .	Mamm creek . . . . .	May 4, 1887	2.67	256.65	79
The Shutt ditch . . . . .	Battlement creek . . . . .	May 11, 1887	3.00	259.32	80
The Cedar Grove ditch . . . . .	Battlement creek . . . . .	June 8, 1887	3.00	262.32	81
The Talhmadge & Gibson ditch, second enlargement . . . . .	Divide creek . . . . .	July 9, 1887	1.66	265.32	82
The Hill ditch . . . . .	Beaver creek . . . . .	July 14, 1887	2.50	266.98	83
The R. and A. G. Anderson ditch . . . . .	Cache creek . . . . .	July 15, 1887	4.00	269.48	84
The Battlement ditch, second enlargement . . . . .	Battlement creek . . . . .	July 21, 1887	3.33	273.48	85
The Martin & Kennedy ditch . . . . .	Cache creek . . . . .	July 27, 1887	5.58	276.81	86

## STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 45—Concluded.

NAME OF DITCH, CANAL OR RESERVOIR.	STREAM FROM WHICH WATER IS TAKEN.	DATE OF APPROPRIATION.	Cubic feet of water decreed to each priority.	Summation of decrees to each ditch, canal or reservoir.	Cubic feet per sec. previously appropriated in district.	Order of priority in district.
The O'Brien & Baumgartner ditch . . . . .	Cache creek . . . . .	July 31, 1887	4.00	. . . . .	282.39	87
The Cottonwood Feeder . . . . .	Gulch . . . . .	Aug. 7, 1887	4.00	. . . . .	286.39	88
The McDonald ditch . . . . .	Battlement creek . . . . .	Sept. 1, 1887	2.92	. . . . .	290.39	89
The Rippler ditch . . . . .	Mamm creek . . . . .	Sept. 5, 1887	3.00	. . . . .	293.31	90
The Homestake ditch, first enlargement . . . . .	Wallace creek . . . . .	Sept. 10, 1887	3.87	5.20	296.31	91
The Goodenough ditch . . . . .	Beaver creek . . . . .	Sept. 27, 1887	0.30	. . . . .	300.18	92
The Blue Bird ditch . . . . .	Cache creek . . . . .	Sept. 28, 1887	2.42	. . . . .	300.48	93
The Beaver Creek ditch . . . . .	Beaver creek . . . . .	Sept. 29, 1887	0.42	. . . . .	302.90	94
The Canary Bird ditch, first enlargement . . . . .	Spring Run gulch . . . . .	Oct. 1, 1887	1.00	2.00	303.32	95
The Porter ditch, first enlargement . . . . .	Divide creek . . . . .	Oct. 11, 1887	8.83	12.25	304.32	96
The Clear Creek ditch, second enlargement . . . . .	Divide creek . . . . .	Oct. 14, 1887	.17	3.50	313.15	97
The West Divide Creek ditch, first enlargement . . . . .	Divide creek . . . . .	Oct. 29, 1887	2.92	8.09	316.65	98
The Mountain Sheep ditch . . . . .	Beaver creek . . . . .	Nov. 24, 1887	1.58	. . . . .	319.57	99
The Shatt ditch, first enlargement . . . . .	Battlement creek . . . . .	Dec. 1, 1887	3.00	6.00	321.15	100
The R. F. ditch, second enlargement . . . . .	Battlement creek . . . . .	Dec. 20, 1887	2.83	9.58	324.15	101



The Jay Bird ditch, first enlargement . . . . .	Cache creek . . . . .	Jan. 25, 1888	2.00	3.00	326.98	102
The Huntley ditch, second enlargement . . . . .	Battlement creek . . . . .	Jan. 28, 1888	5.00	11.17	328.98	103
The Ward & Reynolds ditch, second enlargement . . . . .	Divide creek . . . . .	Feb. 13, 1888	2.92	5.92	333.98	104
The Wm. H. Reynolds ditch, first enlargement . . . . .	Divide creek . . . . .	Feb. 16, 1888	.53	.70	336.90	105
The Humming Bird ditch, first enlargement . . . . .	Cache creek . . . . .	Feb. 27, 1888	1.00	2.00	337.43	106
The R. F. ditch, third enlargement . . . . .	Battlement creek . . . . .	Mar. 6, 1888	3.33	12.91	338.43	107
The Musconetcong ditch, first enlargement . . . . .	Battlement creek . . . . .	Mar. 7, 1888	2.67	5.09	341.76	108

## MISCELLANEOUS STATEMENT CONCERNING DITCHES IN WATER DIVISION No. 5.

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER, PREVIOUS TO DECEMBER 1, 1888, BUT WHICH, BY REASON OF DEFECTIVE DESCRIPTIONS OR BECAUSE THEY ARE SITUATED IN THAT PART OF THE DIVISION NOT SUBDIVIDED INTO DISTRICTS, ARE NOT FOUND UNDER THE HEADS OF WATER DISTRICTS

NAME OF DITCH	Stream from which water is diverted	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
<i>a</i> F. E. Wheeler ditch . . . . .	{ Meadow cr. (br.) of Sheep Horn }	Aug. 31, 1887	June 1, 1881	6.00	F. E. Wheeler
<i>a</i> F. E. Wheeler ditch, enlargement	{ Meadow cr. (br.) of Sheep Horn }	Aug. 31, 1887	June —, 1885	1.00	F. E. Wheeler
<i>b</i> Frank E. Lightly ditch . . . . .	{ Gunnison river, Gunnison county }	Nov. 30, 1887	. . . . .	8.00	Frank E. Lightly
<i>c</i> The May-Bohm ditch . . . . .	Ohio creek . . . . .	Nov. 30, 1887	. . . . .	83.00	Thaddens May, John Bohm
<i>d</i> The Imobersteg ditch . . . . .	East river . . . . .	Feb. 7, 1888	. . . . .	4.00	Robert Imobersteg
Clear Creek ditch . . . . .	Clear creek . . . . .	Feb. 18, 1888	May 1, 1884	1.40	Wm. Gregor, F. B. Wisomer
<i>e</i> The Montezuma Valley Water Supply Company's canal . . . . .	Dolores river . . . . .	Mar. 7, 1888	Nov. 25, 1885	700.00	{ The Montezuma Valley Water Supply Company, B. L. Arbocain, president.
<i>f</i> Harris-Bohm Potato ditch . . . . .	Ohio creek . . . . .	April 5, 1888	. . . . .	23.00	H. H. Harris, John Bohm
<i>g</i> Eilebrecht Gooseberry-cr'k ditch . . . . .	Gooseberry creek { Ohio cr. via Har- ris Bohm Potato }	April 23, 1888	. . . . .	3.00	Herman Eilebrecht
<i>h</i> Francis Eilebrecht ext'n's n ditch . . . . .	{ Teachout ditch }	May 1, 1888	. . . . .	10.00	Francis Eilebrecht
<i>i</i> The Herman Eilebrecht Ditch } No. 2	. . . . .	May 1, 1888	. . . . .	4.00	Herman Eilebrecht
<i>j</i> John W. Andrews Irrigating ditch . . . . .	McDonough creek . . . . .	May 9, 1888	. . . . .	19.40	John W. Andrews
<i>k</i> John A. Adams ditch . . . . .	Gunnison river . . . . .	June 4, 1888	. . . . .	6.00	John A. Adams

The Montezuma and San Juan } canal		Rio Dolores	June 27, 1888	April 2, 1888	2500.00	The Montezuma and San Juan Canal (Co., M. J. Mack, pres.; F. L. Payson, sec
l Watt ditch		East river	June 29, 1888	May 29, 1888	6.00	
H. S. George's ditch		— creek	June 30, 1888	June 4, 1888	1.00	H. S. George
Essex ditch		School creek	July 2, 1888		14.00	A. D. Wallace
m McKean Ditch No. 1		King creek	July 6, 1888		2.00	James M. McKean
m McKean Ditch No. 2		King ditch	Jan. 6, 1888		3.00	James M. McKean
n Richard Ball Irrigating ditch		East river	July 7, —		9.50	Jas. Watt, Mrs. M. E. Love, Rich'd Ball
o Imobersteg ditch		Willow creek	July 7, 1888		5.00	Robert Imobersteg
p Alkali ditch		East river	July 26, 1888		7.00	Wm. Strevel
q East River ditch		East river	July 26, 1888		9.00	J. M. Harris, Wm. Strevel
Allen ditch		Mason creek	July 31, 1888	May —, 1886	2.00	Alpheus Allen
r Ohio Creek Ditch No. 1		Ohio creek	Aug. 1, 1888		6.00	D. S. McGlashan
s Ohio Creek Ditch No. 2		Ohio creek	Aug. 1, 1888		6.00	D. S. McGlashan
t Squirrel Creek Ditch No. 1		Squirrel creek	Aug. 1, 1888		6.00	D. S. McGlashan

a The total capacity of this ditch is seven cubic feet per second

b Work said to have been complete, November 14, 1887.

c Work said to have been nearly complete, February 3, 1888.

d A reservoir is connected herewith.

e Ditch said to have been complete April 2, 1888.

f Ditch said to have been complete April 21, 1888.

g Ditch said to have been nearly completed April 23, 1888.

h Ditch said to have been surveyed April 19, 1888.

i Ditch said to be complete December 27, 1887.

j Ditch said to be practically complete throughout its entire length

June 2, 1888.

l Ditch said to have been completed on June 26, 1888.

m "The work on said ditches was done in August, 1886," according to

Statement

n Ditch said to be complete, July 2, 1888.

o 4.00 cubic feet per second is claimed from Willow and 1.00 cubic foot

per second from Grouse creek; said to be complete July 6, 1888.

p Said to be complete July 25, 1888.

q Said to be complete July 25, 1888.

r Said to have been completed in July, 1883.

s Said to have been completed in July, 1886.

t Said to have been completed in June, 1883.

MISCELLANEOUS STATEMENT CONCERNING DITCHES IN WATER DIVISION No. 5—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of Filing in State Engineer's office.	Time of Commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
<i>a</i> Squirrel Creek Ditch No. 2.	Squirrel creek	Aug. 1, 1888		6.00	D. S. McGlashan
<i>b</i> Squirrel Creek Ditch No. 3.	{ Squirrel creek and South branch.	Aug. 1, 1888		12.00	D. S. McGlashan
<i>c</i> Little Prospect ditch	Little Prospect cr'k	Aug. 9, 1888		9.48	Marcellus Pruyn
<i>d</i> Chiquito ditch	Chiquito Dolores	Sept. 1, 1888	April 6, 1888	11.00	W. P. Ela et al
Grand River Land and Cattle Company ditch.	N. Fork Derby cr'k	Aug. 28, 1888	Sept. 29, 1887	38.00	{ The Grand River Land and Cattle Co., John Edge, supt.
<i>e</i> Mergleman Ditch No. 1.	Willow creek	May 14, 1888		12.00	A. W. Mergleman
<i>f</i> Mergleman Ditch No. 2.	Willow creek	May 14, 1888		6.00	A. W. Mergleman
<i>g</i> Mergleman Ditch No. 3.	Willow creek	May 14, 1888		6.00	A. W. Mergleman
<i>h</i> Henry Purrier Ohio Creek ditch.	Ohio creek	Oct. 8, 1888		50.00	Geo. W. Lightly, C. A. Green
Ohio and Kokomo ditch.	Mill creek	Sept. 22, 1888	July 1, 1887	13.25	Frank P. Brown et al
Beaver Creek ditch and lateral.	Beaver creek	Sept. 22, 1888		27.00	W. H. Wilt
Eder Creek ditch	Eder creek	Sept. 22, 1888	May 1, 1884	9.60	Theodore A. Davis, Edwin L. Davis
<i>i</i> Cornell Rankin Irrigating ditch.	East river	Oct. 19, 1888		12.00	J. B. Cornell, John C. Rankin
<i>j</i> The Merriman ditch	Sunny Side	Oct. 22, 1888	April 10, 1885	5.20	Andrew J. Merriman
<i>k</i> Lone Cone ditch	{ Naturita creek and tributaries. }	Nov. 8, 1888	July 11, 1888	25.00	Roger Williams et al
<i>l</i> McCluskey ditch	Willow creek	Nov. 28, 1888			Geo. McCluskey

- a* Said to have been completed in June, 1884.  
*b* 9,000 cubic feet per second claimed from Squirrel creek and 3,000 cubic feet per second from South Branch; said to have been partially completed July 31, 1888.  
*c* Amount of water claimed, 1.5 cubic feet per second.  
*d* This ditch may be in Water District No. 42, which is not clearly defined.  
*e* Completed before May 7, 1885.
- f* Completed before May 7, 1885.  
*g* Completed before May 7, 1885.  
*h* Completed before January 1, 1881.  
*i* Survey made October 11, 1888.  
*j* Completed May 15, 1885.  
*k* Several reservoirs connected therewith.  
*l* Capacity of this ditch is said to be about 100 inches; water claimed to have been appropriated by original construction, May 25, 1888.

# MISCELLANEOUS STATEMENT CONCERNING RESERVOIRS IN WATER DIVISION No. 5,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO DECEMBER 1, 1888, BUT WHICH, BY REASON OF DEFECTIVE DESCRIPTIONS, OR BECAUSE THE RESERVOIRS WERE LOCATED IN UNDISTRICTED PORTIONS OF THE DIVISION, ARE NOT FOUND IN THE STATEMENTS RELATIVE TO THE RESERVOIRS OF WATER DISTRICTS HEREINBEFORE GIVEN.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic ft.	NAME OF CLAIMANT.
The Montezuma Valley) Water Supply Co.'s reservoir . . . . .	Dolores river	The Montezu- ma Val. Wat. Sup Co's can	Mar 7, 1888	Nov. 25, 1885	260,000,000	{ The Montezuma Valley Water Supply Co., B. L. Arbecam, pres.
*The Roaring Fork & Grand River Ditch & Land Co.'s Res. No. 1)	Cattle creek	The R. F. & G. R D. & L. Co's ditch	May 25, 1888			{ The Roaring Fork & Grand River ditch & Land Co., W. H. Bradt, Supt. & Eng.
†The Roaring Fork & Grand River Ditch & Land Co.'s Res. No. 2)	Cattle creek	The Roaring Fork & G. R ditch	May 25, 1888			{ The Roaring Fork & Grand River Ditch & Land Co., W. H. Bradt, Supt. & Eng.

\*Capacity given as 150,000 gallons, 20,000 cubic feet.

†Capacity give 1 as 12,000,000 gallons, 1,600,000 cubic feet.



## CHAPTER VII.

## RELATIVE TO WATER DISTRICTS NOS. 43-44,

AND TO NORTH PARK AND OTHER PORTIONS OF THE STATE NOT  
EMBRACED IN WATER DIVISIONS.

Water districts numbered 43 and 44 are in no water division. The White and Yampa rivers, upon which they are situated, are tributaries of the Green, which is a continuation of the Colorado, and not a branch of the Grand, so that they can not be regarded as being in Water Division No. 5.

## WATER DISTRICT No. 43.

*Water District No. 43, W. H. Clark, Water Commissioner.* Appointed June 25, 1887. Residence, Meeker, Garfield county.

Water District No. 43 consists of all lands irrigated by ditches taking water from the White river and its tributaries.

Mr. Clark reports for the year 1888, that the adjudication of water rights was proceeding in Water District No. 43 at the time of his report (August 25); that he could not report upon the ditches in the western part of Garfield county at that time, but hoped to be able to do so in the fall; that the following particulars concerning ditches, and the use made of water in his district, were only approximate:

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 43,  
BY THE WATER COMMISSIONER.

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
The Henry ditch . . .	$\frac{1}{8}$	80	. . . . .		20	5
The Pettyear ditch . .	$\frac{1}{8}$	80	. . . . .		15	. . .
The Marcott ditch . . .	$\frac{3}{4}$	120	. . . . .		40	10
The Peterson & Coon } ditch . . . . . }	$\frac{1}{2}$	100	. . . . .		80	10
The Greenstreet ditch .	1	90	. . . . .		50	2
The La Kamp ditch . .	$\frac{3}{4}$	80	. . . . .		20	25
The E. H. Watson ditch	$1\frac{1}{4}$	120	. . . . .		80	10
The Doum ditch . . . .	$1\frac{1}{4}$	80	. . . . .		40	30
The G ditch . . . . .	$\frac{1}{2}$	40	. . . . .		20	. . . . .
The Warren ditch . . .	$\frac{3}{4}$	50	. . . . .		25	3
The Brady ditch . . . .	$\frac{1}{2}$	50	. . . . .		40	. . . . .
The Veatch ditch . . .	1	35	. . . . .		20	4
The Highland ditch . .	8	3,500	25	20	250	200
The Old Agency ditch .	4	1,500	50	25	1,000	150
The South Side ditch . .	$3\frac{1}{2}$	960	20	10	600	200
The Coal Crk Mesa ditch	$4\frac{1}{2}$	800	. . . . .		80	80
The Coal Creek Valley } ditch . . . . . }	$\frac{1}{4}$	100	. . . . .		30	60
The Dibert ditch . . . .	$\frac{1}{2}$	65	. . . . .		25	10
The Coal Crk Ditch No. 1	1	450	. . . . .	300	5	40
The Little Beaver ditch	$2\frac{1}{2}$	200	. . . . .		160	30
The Kitchen ditch . . .	$1\frac{1}{2}$	160	. . . . .		100	4
The Martin ditch . . . .	$1\frac{1}{4}$	100	. . . . .		80	25
The Proctor reservoir . .	$\frac{1}{2}$	100	. . . . .		50	. . . . .
The Payson ditch . . . .	$\frac{1}{2}$	100	. . . . .		80	5
The S. C. Wright ditch .	$1\frac{1}{4}$	100	. . . . .		70	20
The Hossack ditch . . .	$1\frac{1}{2}$	100	. . . . .		60	. . . . .
The Meeker Town Site } Co. ditch . . . . . }	3	600	60	10	200	100
The Morton-Baker ditch	$2\frac{1}{4}$	250	20	. . . . .	180	30
The J. Fouch ditch . . .	$1\frac{3}{4}$	120	. . . . .		80	30

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses, other than alfalfa, irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
The B. C. Howey ditch . . . .	2¼	100			60	30
The Nichols ditch . . . .	1½	100			30	50
The Melvin ditch . . . .	1½	90			60	30
The Barnhart ditch . . . .	2	120			30	1
The J. E. Rooney ditch . . . .	1	110			65	25
The A. B. & A. ditch . . . .	2	300			100	80
The B. & W. ditch . . . .	1¼	100			20	65
The Niblock ditch . . . .	3¼	390		30	120	40
The Powell Park ditch . . . .	5	2,400	60	10	1,200	400
The P. P. Harp ditch . . . .	1	90			65	10
The P. E. Wagner ditch . . . .	½	100			60	
The Loring ditch . . . .	4	1,000	20		400	100
The Attix ditch . . . .	¾	80			40	30
The H. I. Hay ditch . . . .	1	100			50	10
The Smith ditch . . . .	½	100	10	25	720	25
The Blair ditch . . . .	¼	120			40	30
The Eastham ditch . . . .	1¼	100			40	5
The White River City ditch . . . .	2¾	300				
The Burch ditch, Nos. 1 and 2 . . . .	¾	200			80	30
The Sayer ditch . . . .	1	150			120	
The Metz & Reigan ditch . . . .	2	240			140	35
The J. M. Cole ditch . . . .	1	100			100	20
The J. W. Cox ditch . . . .	1	85			60	
The Story ditch . . . .	¾	65			40	
The A. I. Ryan ditch . . . .	½	100			65	10
The B. M. & H. ditch . . . .	3¼	340			200	50
The M. H. & M. ditch . . . .	3	280			160	30
The B. & M. ditch . . . .	4	340			200	40
The P. (P. L.) ditch . . . .	1½	120	30		60	20
The Collins ditch . . . .	1	100			65	25
The H. H. Leonard ditch . . . .	½	100			40	

NAME OF DITCH.	Length thereof in miles.	Number of acres that can be irrigated therefrom.	Number of acres of alfalfa irrigated therefrom.	Number of acres of seeded grasses other than alfalfa irrigated therefrom.	Number of acres of natural grasses irrigated therefrom.	Number of acres of other crops irrigated therefrom.
The Oldland ditch . . .	$\frac{1}{2}$	120			80	2
The Sprague ditch . . .	$\frac{3}{4}$	50			30	3
The J. B. Wallace ditch .	$\frac{3}{4}$	60			45	
The Pat Fahey ditch . .	$\frac{1}{2}$	70			50	1
The F. A. Gordon ditch.	$\frac{1}{2}$	60			30	
The Juo. C. Schutte ditch	$1\frac{1}{2}$	80			60	
The Morgan ditch. . . .	$\frac{1}{2}$	100			85	5
The Larson ditch . . . .	$2\frac{1}{4}$	100	40	20	50	5
The Hathaway ditches } Nos. 1 and 2. . . . . }	$\left. \begin{array}{l} 1\frac{1}{4} \\ 1\frac{1}{2} \end{array} \right\}$	100			60	
The J. B. Hayes ditch . .	$\frac{1}{2}$	80			60	5
The E. O. Hughes ditch .	$\frac{3}{4}$	80			50	
The J. F. Hay ditch. . .	$\frac{3}{4}$	80			45	1
The Reigan ditches. / Nos. 1 and 2. . . . . /	$\left. \begin{array}{l} 1 \\ 11 \end{array} \right\}$	160			100	
The Oak Ridge Park ditch . . . . .					Under construction	

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT NO. 43,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1886.

NAME OF DITCH	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Schutttee Ditch No. 1	Piceance creek	Sept. 7, 1887	May 10, 1884	2.00	John C. Schutttee
Schutttee Ditch No. 2	Piceance creek	Sept. 7, 1887	April 1, 1885	2.00	John C. Schutttee
J. W. Cox ditch	Piceance creek	Sept. 15, 1887	May 1, 1886	2.50	John W. Cox
Last Chance ditch	{ Taylor, or Hm- ter creek.	Sept. 15, 1887	April 13, 1887	3.00	W. T. Moffett, Robert McKee
Ryan ditch	Piceance creek	Sept. 15, 1887	May 1, 1884	3.00	A. J. Ryan
*D. Sayer ditch	Piceance creek	Sept. 15, 1887	May 15, 1884	2.50	Daniel Sayer, Harry S. Beakes
†Slate ditch	Slate creek	Nov. 19, 1887	July 23, 1886	3.00	C. Aicher
‡Little Beaver ditch	Little Beaver creek	Dec. 10, 1887	Abt. May 10, '85	37.66	A. J. Vonkers, L. S. Bloomfield
§Old Agency ditch	White river	Dec. 14, 1887		22.40	E. Goss et al
Coal Creek Ditch No. 1	Coal creek	Dec. 19, 1887	May 1, 1883	13.00	Samuel Martin et al
Coal Creek Valley ditch	Coal creek	Dec. 30, 1887	May 28, 1886	16.65	Gilbert Wesson, Henry McLaughlin
Hayes Ditch No. 1	Dry Piceance creek	Dec. 30, 1887	April 1, 1886	1.00	James Hayes

\* Additional water from a spring, and feeding said ditch, is claimed, to extent of 1.5 cubic feet per second.

† 3.456 cubic inches per second claimed.

‡ 10,368 cubic inches, or 6 cubic feet, per second claimed.

§ Also said to be property of the Old Agency Ditch Company.

|| Six cubic feet per second claimed.

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 43—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Hayes Ditch No. 2	Dry Piceance creek	Dec. 30, 1887	April 1, 1886	1.00	James Hayes
*J. F. Hay ditch	Dry Piceance creek	Jan. 10, 1888	Aug. 15, 1886	1.69	John F. Hay
Meeker Town Site Co.'s ditch	White river	Jan. 19, 1888	May 1, 1884	15.00	Meeker Town Site Co., J. L. Hatton, pres.
B. and W. ditch	Flag creek	Jan. 19, 1888	May 20, 1887	2.60	J. H. Bearce, John A. Watson
P. P. Harp ditch	Sulphur creek	Jan. 23, 1888	June 4, 1885	2.00	P. P. Harp
M., H. and M. ditch	Piceance creek	Jan. 25, 1888	April 19, 1887	7.00	Joseph McKee et al
†H. J. Hay ditch	Spring creek	Jan. 26, 1888	May 1, 1883	2.28	Henry J. Hay
F. A. Gordon ditch	Piceance creek	Mar. 28, 1888	July 25, 1887	3.29	Fred. A. Gordon
White River Town and Land Co.'s ditch	Piceance creek	Mar. 28, 1888	Oct. 24, 1887	10.50	White River Town and Land Co., by A. J. Gregory.
Rangely ditch	White river	April 25, 1888	Sept. 16, 1887	22.84	Charles P. Hill
Monitor ditch	White river	May 14, 1888	Jan. 24, 1888	7.25	George Jones
‡Blue Grass ditch	Stewart creek	May 16, 1888	July 12, 1887	6.888	H. H. Leonard
§Rye Grass ditch	Piceance creek	May 16, 1888	July 12, 1887	5.88	H. H. Leonard
Larson ditch	Piceance creek	May 29, 1888	Sept. 21, 1886	4.00	Henry C. Larson
Lowland Ditch No. 2	White river	July 26, 1888	Jan. 3, 1887	3.00	Henry Wells, Walter Wells
¶Hughes Ditch No. 1	Dry Piceance creek	Aug. 6, 1888			George H. Hathaway & Co.
¶¶Hughes Ditch No. 2	Dry Piceance creek	Aug. 6, 1888	Spring, 1884	4.76	George H. Hathaway & Co.



Bob Reigan Ditch No. 1 . . . . .	Dry Piceance creek	Sept. 8, 1888	. . . . .	3.88	Robert Reigan
Bob Reigan Ditch No. 2 . . . . .	Dry Piceance creek	Sept. 8, 1888	May 3, 1888	3.37	Robert Reigan
Burch Ditch No. 1 . . . . .	Piceance creek . . . . .	Sept. 8, 1888	Mar. 10, 1887	2.18	M. P. Burch, A. P. Y. Burch
Burch Ditch No. 2 . . . . .	Piceance creek . . . . .	Sept. 8, 1888	July 20, 1887	5.96	M. P. Burch, A. P. Y. Burch
Jordan ditch . . . . .	White river . . . . .	Sept. 24, 1888	June 25, 1888	8.85	John Campbell et al
Metz & Reigan ditch . . . . .	Piceance creek . . . . .	Oct. 3, 1885	Nov. 26, 1885	6.75	Robert Reigan et al

\*Feeder from a spring supplies ditch also.

†Small reservoir shown on plat: no description thereof.

‡1,728 cubic inches per second claimed.

§5,154 cubic inches per second claimed.

||This ditch was probably constructed in spring of 1884: an extension thereto commenced July 24, 1888. The capacity would seem to be at least 4.17 cubic feet per second, and the right to carry it in Hughes ditch No. 1, or this ditch, or *both at the same time*.

## WATER DISTRICT No. 44.

*Water District No. 44—H. Scougall, Water Commissioner.* Appointed July 23, 1888. Residence, Steamboat Springs, Routt county.

Water District No. 44 consists of all lands irrigated by ditches taking water from the Bear, or Yampa, river and its tributaries.

Mr. Scougall reports (*inter alia*) that the great influx of settlers during the past two years has been accompanied by the rapid construction of irrigation ditches, and that the area of land irrigated has been increased by at least fifty *per centum* during that period; that no attempt has as yet been made to carry water onto the high mesa lands, such ditches as have been constructed being intended for the irrigation of bottom lands; that excellent opportunities are presented for remunerative investment of capital in the construction of canals, from ten to thirty miles in length, which would bring under cultivation large areas of land now used only as ranges for cattle; that few of the ditches constructed have head-gates, and none of them have measuring flumes; that the district is too large, and that he would recommend the subdivision thereof.

# STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 41,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
The Oak Creek ditch . . . . .	Oak creek . . . . .	Oct. 20, 1887	July 25, 1887	25.00	Samuel H. Sharp, Herod Fulton
a The Enterprise ditch . . . . .	Walton creek . . . . .	Jan. 4, 1888	Oct. 8, 1887		Frank Hall, A. E. Baker
Yampa ditch . . . . .	Bear river . . . . .	April 9, 1888	Aug. 1, 1887	12.00	F. M. Haugney, B. B. Cooper
Cary ditch . . . . .	Bear river . . . . .	April 21, 1888	Nov. 10, 1887	15.00	Samuel S. Cary et al
Dunston ditch . . . . .	Second creek . . . . .	May 19, 1888	May —, 1886	6.00	Thomas Dunston
Sand Creek ditch . . . . .	Sand creek . . . . .	May 19, 1888	May —, 1886	8.00	R. J. Dunston
Beaver ditch . . . . .	Beaver creek . . . . .	June 15, 1888	May 15, 1886	10.00	William E. Crowner
b Worthington ditch . . . . .	Williams Fork { West Branch of Middle creek. }	June 18, 1888			Union Worthington
Foildle ditch . . . . .	Fish creek . . . . .	June 21, 1888	May 16, 1888	4.00	Lewis Foildle
Koll ditch . . . . .	Milk creek . . . . .	July 19, 1888	May 10, 1888	4.00	John Koll
c Milk Creek ditch . . . . .	Milk creek . . . . .	July 21, 1888	Fall —, 1887	3.33	Lec St. Clair
d J. A. Martin ditch . . . . .	Milk creek . . . . .	July 23, 1888	May —, 1886	5.00	J. A. Martin
e Martin & Young ditch . . . . .	Hallett creek . . . . .	July 23, 1888	June —, 1887		J. A. Martin, D. M. Young
Grouse Creek ditch . . . . .	Grouse creek . . . . .	July 25, 1888	May 25, 1888	6.00	D. H. Carpenter

STATEMENT CONCERNING DITCHES IN WATER DISTRICT No. 4—*Concluded.*

NAME OF DITCH.	Stream from which water is diverted	Date of filing in State Engineer's office.	Time of commencement of work thereon	Capacity claimed in cubic feet per second	NAME OF CLAIMANT
Bird & Laughlin ditch . . . . .	Watson creek	July 27, 1888	June 9, 1888	10.00	J. Albert Bird, Robert W. Laughlin
Bird ditch . . . . .	Bear river	July 27, 1888	June 25, 1882	75.00	Wm. Bird et al
The Lackey Irrigating ditch . . . .	Williams Forks . . . . .	Aug. 4, 1888	June 4, 1888	7.00	Matthews Flinn, Charles L. Woolley
Service ditch . . . . .	{ South Fork of Gronse creek. }	Aug. 9, 1888	May 29, 1888	6.50	Douglass D. Lees
f D. D. & E. ditch . . . . .	Milk creek	Aug. 15, 1888			A. L. Durham et al
Hayden Gulch ditch . . . . .	Hayden gulch	Aug. 17, 1888	June 1, 1886	5.00	Wm H. Card
Middle Creek ditch . . . . .	Middle creek	Aug. 20, 1888	May 25, 1886	16.87	Wm. F. Thayer
Miner Boys' ditch . . . . .	Oak creek	Aug. 29, 1888	June 1, 1888	14.40	John Hart, W. O. Cook
West Creek ditch . . . . .	West creek	Aug. 29, 1888	May 27, 1888	5.52	Wm. F. Thayer
Wisconsin ditch . . . . .	Fortification creek	Sept. 5, 1888	May 19, 1888	10.00	C. A. Seymour, John T. Whyte
Denison ditch . . . . .	Bear river	Oct. 9, 1888	Nov. 1, 1886	9.33	Geo. W. Lawrence et al
A. Q. Irrigating ditch . . . . .	Good Spring creek	Oct. 13, 1888	June 27, 1888	8.00	Wm. H. James et al
Callom ditch . . . . .	Morgan creek	Oct. 15, 1888	July 15, 1888	27.00	Joseph S. Callom
The Elk Valley ditch . . . . .	Elk river	Sept. 8, 1888	Oct. 15, 1887	22.00	J. M. Trull et al
Morin ditch . . . . .	Elk river	Sept. 13, 1888	April 24, 1888	10.00	Joseph Morin et al
The Coleman ditch . . . . .	Deep creek	Sept. 20, 1888	Aug. 19, 1888	3.00	Walter Coleman
The Metcalf Ditch No. 2 . . . . .	Soda creek	Sept. 22, 1888	Sept. 10, 1888	11.50	Samuel F. Borland

Borland ditch	Soda creek	Sept. 22, 1888	Sept. 6, 1888	15.00	Samuel F. Borland
Metcalf ditch	Soda creek	Sept. 22, 1888	Sept. 6, 1888	10.00	Fred. A. Metcalf, second
Emmon Irrigating ditch	Spring creek	Sept. 25, 1888	June 15, 1888	25.00	R. S. Jones, Albert Bourguin
The Hitchins Springs ditch	Springs	Nov. 9, 1888	Oct. 23, 1888	6.50	James H. Hitchins
The Upper Elk Ditch Co.'s ditch	Elk river	Nov. 19, 1888	Aug. —, 1888	16.00	Peter C. Borgen, F. M. Jones
Clarke & Burke ditch	Elk river	Nov. 22, 1888	May 1, 1888	11.5	P. J. Burke, Rufus Clark

*a* Head-gates to carry 1500 inches of water.

*b* 1000 inches claimed; said to be complete, June 4, 1888.

*c* Little Beaver Creek ditch shown on plat; no statement relative thereto.

*d* A ditch designated "Martin & Young ditch" on plat, and said in statement to have been built in June, 1887, is said in this statement to belong to A. J. Martin and D. M. Young.

*e* Mentioned in plat and statement of the J. A. Martin ditch.

*f* Durham, Dickinson & Edwards is referred to as the firm name.

## STATEMENT CONCERNING RESERVOIRS IN WATER DISTRICT No. 44,

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
Reservoir.	Hulett creek.					A. J. Martin, D. M. Young



## NORTH PARK.

In the county of Larimer, west of Water District No. 3, there is a large tract of country, including North Park, which has not as yet been created into water districts. (See drainage map of Colorado, in Part II. hereof.)

It is not known exactly what area of land in this portion of Larimer county can be brought under irrigation, but it is evident, from the number of ditch statements filed in this office from that locality, that it will be no inconsiderable amount. Applications have been received from residents of North Park asking this department to favor the creation of water districts in the Park, concerning which see Chapter IX.

## STATEMENT CONCERNING DITCHES IN NORTH PARK.

RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO  
DECEMBER 1, 1888.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Custer Mountain ditch . . . . .	Michigan river . . . . .	July 28, 1888	April 18, 1888	28.00	Edmund Graves, James Graves
Hubbard ditch . . . . .	Illinois creek . . . . .	July 31, 1888	June 1, 1888	10.00	Edward R. Hubbard
Hubbard Ditch No. 1 . . . . .	Illinois creek . . . . .	July 31, 1888	Dec. 1, 1887	10.00	Edward R. Hubbard
Old S. C. ditch . . . . .	Michigan river . . . . .	Aug. 25, 1888	July 31, 1888	112.00	Geo. W. Seifert
999 ditch . . . . .	Big Grizzly river . . . . .	Sept. 4, 1888	June 1, 1885	3.00	James Murphy
*Buckeye Irrigating ditch . . . . .	Michigan river . . . . .	Sept. 6, 1888			W. F. Fisher, Geo. S. Fletcher
†Col. Davis Ditch No. 1 . . . . .	Michigan river . . . . .	Sept. 6, 1888			Collin E. Davis
Boomerang ditch . . . . .	Michigan river . . . . .	Sept. 25, 1888	Sept. 14, 1888	14.00	Geo. Birkett
Owl Creek ditch . . . . .	Owl creek . . . . .	Sept. 29, 1888	June 15, 1876	28.00	August Speck et al
Main ditch . . . . .	Little Grizzly river . . . . .	Oct. 1, 1888	June 15, 1885	28.00	John Riach et al
Edith (North Park) ditch . . . . .	Cheyenne creek . . . . .	Oct. 4, 1888	May 1, 1886	10.00	Frank E. Hodgson, Geo. A. Hodgson
Poverty Flat Ditch No. 2 (North Park) . . . . .	Michigan river . . . . .	Oct. 9, 1888	Sept. 26, 1888	34.00	Salem M. Hardy
Kiowa ditch . . . . .	Michigan river . . . . .	Oct. 16, 1888	Sept. 14, 1888	11.00	Geo. Birkett
Eureka ditch . . . . .	Arapahoe creek . . . . .	Nov. 15, 1887	Sept. 8, 1887	55.00	William G. Mellen, Charles Bock
Hayes ditch (Washington county)	Hayes creek, (Dr. N. F. Republican riv)	Feb. 23, 1888		8.00	Wm. L. Campbell

# NORTH PARK

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Park ditch (North Park)	Lake creek	June 20, 1888	June 6, 1888	11.00	Montie Blevins
Montie ditch (North Park)	Lake creek	June 20, 1888	Sept 16, 1885	11.00	Montie Blevins
North Park Ditch No. 7 (N. Park)	Michigan river	June 20, 1888	April 9, 1888	14.00	Montie Blevins
Donelson ditch (North Park)	Little Willow creek	June 28, 1888	May 4, 1885	23.00	W. F. Donelson
The Ward Ditch No. 1 (N. Park)	Illinois creek	July 5, 1888	April 5, 1888	12.00	M. C. Ward, H. C. Boston
The Ward Ditch No. 2 (N. Park)	Illinois creek	July 5, 1888	April 5, 1888	7.00	M. C. Ward, H. C. Boston
Soldiers' Home ditch (N. Park)	Owl creek	July 23, 1888	May 20, 1885	11.00	Thomas Vils
Wolfer ditch (North Park)	Roaring Fork	July 24, 1888	April 11, 1888	9.00	A. Wolfer
Lost Treasure ditch	Michigan river	Oct. 23, 1888	Sept. 27, 1888	132.00	Gilbert Hayes et al
Lowland ditch	Owl creek	Oct. 23, 1888	June 10, 1884		Gilbert Hayes, Carl D. Muller
Rocky ditch	Arapahoe creek	Oct. 30, 1888	May 1, 1888	40.00	W. J. Tronnsell, Roberts M. Davids
Dora ditch	Cheyenne creek	Oct. 30, 1888	May 1, 1887		James Leade, Geo. A. Hodgson
Timber ditch	Hill creek	Oct. 30, 1888	Oct. 1, 1884		John Edwards
Bostwick ditch	Michigan river	Nov. 6, 1888	May 15, 1887	About 8.00	Samuel E. Bostwick
Edith ditch	Michigan river	Nov. 6, 1888	June 15, 1886	About 8.00	Samuel E. Bostwick
Lowland ditch, enlargement and extension thereof	Owl creek	Nov. 9, 1888	Oct. 30, 1888	About 7.00	Sam Carden
Home Ditch No. 1	Illinois river	Nov. 13, 1888	May 6, 1883	16.00	J. H. Greene, A. W. Greene
Home Ditch No. 2	Illinois river	Nov. 13, 1888	June 10, 1885	11.00	J. H. Greene, A. W. Greene
Poquette ditch	Michigan river	Nov. 19, 1888			Louis G. Poquette
Roll ditch	Jack creek	Nov. 20, 1888			L. P. Roll

\*Amount of water claimed, 800 inches.  
†Carrying capacity claimed, 216 cubic inches per second.

\*300 inches of water claimed hereunder.  
†1,500 inches of water claimed hereunder.  
‡Carrying capacity claimed about 14 cubic inches per second.

STATEMENT CONCERNING DITCHES IN NORTH PARK—*Concluded.*

NAME OF DITCH	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT
Burke ditch	Buffalo creek	Nov. 20, 1888	Aug. 1, 1888	23.00	Robt. Burke, R. G. Floyd, D. M. Hanson
Wisconsin ditch	Buffalo creek	Nov. 20, 1888	May 15, 1887	40.5	R. G. Floyd, D. M. Hanson
*Stevenson Ditch No. 2	Willow creek	Nov. 22, 1888			Edward P. Stevenson
†Pinkham ditch	Pinkham creek	Nov. 22, 1888			James O. Pinkham
‡Stevenson Ditch No. 1		Nov. 22, 1888			Edward P. Stevenson
§Marr Ditch No. 2	Little Grizzly river	Nov. 22, 1888	Spring, 1883		Wm. Marr
Marr Ditch No. 1	Big Grizzly river	Nov. 22, 1888	Spring, 1887		Wm. Marr
Castle ditch	Big Grizzly river	Nov. 22, 1888	April 15, 1885	About 41.00	Geo. W. Bailey, Dennis O'Brien
*Stevenson Ditch No. 3	Willow creek	Nov. 22, 1888			Edward P. Stevenson
Mallon ditch	Roaring Fork of Platte river	Nov. 26, 1888	April 20, 1888		Barney Mallon
**Brennen ditch	Sand creek	Nov. 28, 1888			Susan Breinen
††Hunter Ditch No. 1	Pinkham creek	Nov. 28, 1888			Jennie H. Hunter
‡‡Hunter Ditch No. 2	Pinkham creek	Nov. 28, 1888			Jennie H. Hunter

\*Carrying capacity claimed, 300 cubic inches per second.

†Claimed to carry 500 cubic inches per second.

‡Capacity claimed, 200 cubic inches per second. Water claimed to be diverted from a stream running through the west  $\frac{1}{2}$  of sec. 26, tp. 6, R. 79 W.

§Claimed to carry 500 cubic inches per second.

||Claimed to carry 100 cubic inches per second.

\*\*Claimed to carry 200 cubic inches per second; 200 inches of water claimed.

††Said to carry 200 cubic inches of water per second.

‡Said to carry 150 cubic inches per second.

‡‡Said to carry 150 cubic inches per second.

# MISCELLANEOUS TABLE—DITCHES.

STATEMENT CONCERNING DITCHES IN COLORADO, RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO DECEMBER 1, 1888, BUT WHICH ARE EITHER IN NO WATER DIVISION OR ARE NOT DEFINITELY ENOUGH DESCRIBED TO INDICATE THE WATER DIVISION IN WHICH THEY MAY BE SITUATED.

NAME OF DITCH.	Stream from which water is diverted.	Date of filing in State Engineer's office.	Time of commencement of work thereon.	Capacity claimed in cubic feet per second.	NAME OF CLAIMANT.
Homestake ditch . . . . .	Wallace creek . . . . .	Mar. 29, 1888	Oct. 8, 1885	6.00	James L. McCully
Troy ditch. . . . .	Owl creek . . . . .	May 31, 1888	April 7, 1888	13.00	Charles E. Quincy
McKean ditch. . . . .	Taonas creek . . . . .	June 11, 1888	April 1, 1888	8.00	G. W. McKean
Bern ditch. . . . .	Big Government cr. . . . .	July 23, 1888	June 29, 1888	12.00	Casper Fox, Peter Fox
*West Varmany ditch. . . . .	West fork of Varmany creek . . . . .	Oct. 23, 1888	Aug. 1, 1888	5.20	S. E. Ball et al
†East Varmany ditch . . . . .	East Varmany crk . . . . .	Oct. 23, 1888	Aug. 1, 1888	5.20	S. E. Ball et al

\*Supplies the West Varmany reservoir.

†Supplies the East Varmany reservoir.

## MISCELLANEOUS TABLE—RESERVOIRS.

STATEMENT CONCERNING RESERVOIRS IN COLORADO, RELATIVE TO WHICH PLATS AND STATEMENTS WERE FILED IN THE OFFICE OF THE STATE ENGINEER PREVIOUS TO DECEMBER 1, 1888, BUT WHICH ARE EITHER IN NO WATER DIVISION OR ARE NOT DEFINITELY ENOUGH DESCRIBED TO INDICATE THE WATER DIVISION IN WHICH THEY MAY BE SITUATED.

NAME OF RESERVOIR.	Name of stream sup- plying water therefor.	Name of ditch leading water thereto.	Date of filing in State Engineer's office.	Time of com- mencement of work thereon.	Capacity claimed in cubic feet.	NAME OF CLAIMANT.
West Yarmany reservoir.	West fork Yarmany c.	West Yar- many ditch	Oct. 23, 1888	Aug. 1, 1888	161,904	S. E. Ball et al
East Yarmany reservoir	East fork Yarmany c.	East Yar- many ditch	Oct. 23, 1888	Aug. 1, 1888	69,381	S. E. Ball et al
Eureka reservoir No. 1.			Sept. 8, 1888	July 16, 1888	19,000,000	{ Eureka Ditch and Reservoir Compa'y, N. G. Field, name of corporation.



## CHAPTER VIII.

## RELATIVE TO RESERVOIRS—DUTY OF WATER—EXPENDITURES OF THE DEPARTMENT, ETC.

The construction of reservoirs for the storage of water for irrigation has received a greater impetus during 1888 than during any other period in the history of the State. On the sixteenth and seventeenth of March, of this year, there convened in the city of Denver, pursuant to a call made by the Governor upon the request of a few wise and patriotic citizens, a large number of men representing various water districts, communities and organizations, and interested in the storage of water for irrigation. This assembly took the name of the *Storage Reservoir Convention*. Papers pertinent to the matter under consideration were read, and discussions of the questions in this way presented followed. The work of the convention culminated in a memorialization of Congress. The result of this, and kindred efforts on the part of those interested in the progress of agriculture in the region of the west dependent upon irrigation, is embodied in "An act making appropriations for sundry civil expenses of the government, for the civil year ending June 13, 1889, and for other purposes," whereby it was provided (*inter alia*) that there be appropriated, "for the purpose of investigating the extent to which the arid region of the United States can be redeemed by irrigation, and for the selection of sites for reservoirs and other hydraulic works necessary for the storage and utilization of water for irrigation and the prevention of floods and overflows, and to make the necessary maps, including the pay of employes in field and in office, the cost of all instruments, apparatus, materials and all other necessary expenses connected

therewith, the work to be performed by the Geological Survey, under the direction of the Secretary of the Interior, the sum of \$100,000, or so much thereof as may be necessary," and that "the Director of the Geological Survey, under the supervision of the Secretary of the Interior, shall make a report to Congress, on the first Monday in December of each year, showing in detail how the said money has been expended, the amount used for actual survey and engineer work in the field in locating sites for reservoirs, and an itemized account of the expenditures under this appropriation. And all the lands which may hereafter be designated or selected by such United State surveys for sites for reservoirs, ditches or canals for irrigation purposes, and all the lands made susceptible of irrigation by such reservoirs, ditches or canals, are from this time henceforth hereby reserved from sale, as the property of the United States, and shall not be subject, after the passage of this act, to entry, settlement or occupation until further provided by law; *Provided*, That the President may, at any time in his discretion, by proclamation, open any portion or all of the lands reserved by this provision to settlement under the homestead laws."

It is not necessary to support at this late date the advisability of the construction of reservoirs in Colorado. It is shown by the discharge sheets accompanying this report that the streams are at flood tide in the spring, and carry but small quantities of water during the fall and winter months. It is fortunate that, since the greatest flow of the streams is not confined to the irrigating season, it should occur during or just before that season. The time that the greater quantity of water will have to be stored is thus short, so that the percentage of water that will be lost from the reservoirs by percolation and evaporation will thus be quite small compared with the percentage of loss that would accompany the storage of

water in the fall and winter months. It is in the securing and presentation of a knowledge of the water supply in certain portions of the State that this department has endeavored to advance the cause of reservoir construction. Such information as this office contains has been placed at the disposal of the Director of the Geological Survey. What has already been accomplished in the direction of reservoir construction is only partially shown in the plates accompanying this report and in the tabulated statements before given. There is no doubt but that many reservoirs are being constructed outside of the districts platted, and of which no notice has been filed in this office.

The portion of the precipitation in the mountains which is available for irrigation on the plains is the excess of the total precipitation over those quantities of water utilized by plants and animals, absorbed by or percolating into the earth, and evaporated, and any measure that would result in the decrease of this loss would increase the available water for irrigation, and *vice versa*. The quantity of water which passes into the soil by absorption or percolation is, of course, not known, but it may be assumed to be small and beyond the power of man to materially affect. But the quantity of water evaporated and utilized by plants is by no means beyond man's ability to modify. Evaporation is the re-vaporization of water; it takes place from wet surfaces exposed to the air; is more rapid, as a rule, on a clear day after a heavy shower, and is most rapid if, besides these conditions, there is a strong, dry wind. Other things being the same, evaporation is greater the higher the temperature. It is, in general, greater from the surface of water than from land, and it is said to be about one-third as rapid from the surface of trees as from the surface of water.

Attention has hereinbefore been called to the fact that east of the Continental Divide, the precipitation of snow and rain in the mountains is much greater, in fact double, that upon the plains and valley lands, and that it is from this precipitation that the streams are directly or indirectly supplied. Just what proportion of this mountainous precipitation is lost, is not known, but the loss is probably not far from sixty per cent. of the snow and rain-fall for average years. It would seem to be in excess of that for the years of minimum, and less for the years of maximum precipitation.

The discharge sheets in Part II. hereof, show the quantity of water carried by some of the streams. It can be determined by calculating from the area of the water-shed and the natural discharge of these streams, about what depth of water over the entire water-shed of the stream is equivalent to the discharge of the stream in any one year. If this be done for the years of mean precipitation, and the water be taken from the corresponding depth over the water-sheds, as indicated by the precipitation records, it may be found what depths of water over the water-shed is lost to the purposes of irrigation.

This information may be used as a basis from which to estimate the discharge of streams which have not been measured. Of course, such an estimate is only roughly approximate. The area of the water-shed, not only of the streams measured, but of all of the streams running from the mountains of Colorado, can be quite accurately determined from the topographical maps and atlas of Colorado, prepared by F. V. Hayden, United States geologist.

It is to be regretted that records of precipitation have not been taken at numerous places in the mountains. The record at Pike's Peak can only furnish a basis for



a very rough estimate of the precipitation in the mountains east of the Continental Divide.

The evaporation from the surface of water on the plains of Colorado is, as a rule, between one-eighth and one-quarter of an inch *per diem*. These matters have been set forth as a preface to a theory recently advanced by Major J. W. Powell, Director of the Geological Survey, concerning the effect of the removal of our mountain forests upon irrigation, which it seems desirable to present, in connection with the consideration of storage reservoirs, since, as is readily seen, it is intimately connected therewith. As Major Powell's view of this subject has been but recently made known, so that time has not been afforded for the mature consideration of it; as it involves questions concerning which but little is known, and the importance of which is too great to permit of hasty conclusions, and as the consideration of the subject naturally falls to the State Forest Commissioner, it is only briefly set forth, and the position is indorsed here to that extent only which is indicated by a strict interpretation of the remarks made in connection therewith. This new theory is in direct opposition to the prevalent belief that the preservation of our mountain forests is necessary to the welfare of irrigation, and may be stated in two parts, as follows:

PART I. *By reason of the mountain forests in Colorado, the total quantity of water flowing through the cañons of the streams is less than would be the case, were the forests removed.*

PART II. *The quantity of water available for late irrigation on the plains would be materially increased by the removal of the mountain forests.* These are, no doubt, startling statements to many. Our forests have for so long been credited with the benevolent purpose of holding around their roots the precipitation upon the

mountains until the proper time arrives to permit the water to gravitate towards the channels, and thus to the plains for the benefit of late irrigation, that it is hard, in one breath, to divest the mind of a belief in their generous qualities, and feel assured, as this theory requires, that they selfishly thrive, at the expense of the weaker, but more valuable vegetation which irrigation fosters.

The old theory *that the removal of the mountain forests is prejudicial to irrigation interests*, seems to rest primarily upon the assumptions that the forests tend to increase the rainfall, and that they equalize the flow of water in the streams throughout the year, and that in consequence thereof more water is caused to fall than would otherwise fall, and that not only a greater supply of water is thus furnished the streams, but that it is furnished later in the irrigation season when most needed, for the reason that the snows lay long in the shade of the forests and are slowly melted. It is held, however, by recent able writers and students of the subject, that forests exert no appreciable influence on the rainfall. This is, for certain reasons, connected with the relation borne by currents of air to high peaks, more likely to be true on the mountains of Colorado than in most other localities, and as a general principal, it would seem to be sustained by the fact, that the most careful observations, extending in some cases over hundreds of years, have failed to indicate with reference to any country where irrigation has been practiced, that by reason of the vegetation so fostered, however luxuriant it may have been, any increase of rainfall has been occasioned. That forests (especially those which are deciduous, *i. e.*, drop their leaves) situated on low mountains, such as those at the head-waters of the upper tributaries of the Ohio river, tend to equalize the flow of water in the streams, and especially to prevent floods, it is believed no one denies. That forests, situated near the summits



of the ranges in Colorado, are especially effective in keeping up a late flow of the streams, is not admitted by all, for reason that will shortly appear.

The new theory would seem to rest upon the assertions that the late water now furnished for irrigation by the streams comes chiefly from the great drifts of snow above timber line; that the mountain forests of Colorado prevent to a great extent the snows falling below timber line on our mountains from drifting into deep chasms and ravines, and consequently prevent the formation of additional great snow drifts; that there is less loss by evaporation from the snow gathered in drifts than were the snow not so collected, on the same principle that a greater evaporation occurs from a given quantity of water exposed in a broad and shallow basin than occurs when the water is confined in a deep and narrow depression; that there is a much greater loss by evaporation from the snow sheltered by the trees, and spread out for long periods to the action of the air ever circulating in currents over the mountains, than from snow exposed to the sun and permitted to melt rapidly, and that the moisture absorbed by the forests of the mountains is very considerable, and if carried to the plains would nourish a very great acreage of crops.

In this connection, it may be observed that the late water for irrigation furnished many of the streams does come chiefly from the great snow-drifts above timber line, though other streams, Bear creek for example, are supplied during the late season almost entirely from springs; that the forests do prevent, to a very great extent, the mountain snows from drifting into deep ravines; that the mountain forests do absorb a large amount of moisture; that spring floods do bring down great quantities of water; that in some of the streams more water is carried during a few days of the spring than during the entire succeeding period embraced

between the fifteenth of August and the fifteenth of October; that the evaporation of snow gathered in drifts is much less, as a rule, than from snow not so collected; that forests protect the snow beneath them by checking the high winds, which sometimes evaporate in a few hours great fields of snow from areas not protected by trees.

A great diversity of conditions is observable in Colorado, even above the 9,000-foot contour line, where are presented southern exposures and northern exposures, localities visited by easterly winds, others by westerly winds, some by dry winds and some by comparatively moist winds, and localities where the snow, if slowly melted, would seep into the soil, re-appearing at lower levels as springs, and others where the snow, if so melted, would percolate into the porous strata and never appear again upon the surface; localities where, if the mountain forests were removed, the snow would, perhaps, be lapped up by dry winds, to be precipitated beyond the confines of the State, while in other places, if the forests were removed, the snow might be blown into great drifts on the ragged breasts of great mountains, where the sun could scarcely melt it during the entire season.

These diversified conditions presented in Colorado, considered in connection with the theories and remarks pertaining thereto, above given, would seem to indicate that neither theory is in harmony with the peculiar conditions observed in all portions of the State.

It may not be amiss to call attention here to the fact that the laws governing water, in whatever form we find it, are most difficult to fathom, and that no theory based upon experiments and observations of it under certain conditions, can be applied without modification to water under different conditions. To illustrate this, water in an ordinary ditch of economical cross-section flows most

rapidly in the center of the channel and just below the surface. It might be assumed that such would be the case in a rectangular flume also, yet in some rectangular flumes (where the depth is about equal to the width) the maximum velocity of water is found near the bottom. It is evident, at any rate, that the removal of the mountain forests will materially affect the quantity of water supplied to the streams, and that the effect of this removal of the forests will be different in different portions of the State. Looked at in the light of the new theory, the application to beneficial use of the forests of certain portions of the State may be welcomed, for it will be felt that the moisture they absorb and encourage to evaporate will be rendered, by their removal, available for irrigation, and thereby there will, in effect, be transported from the inaccessible mountain tops to the accessible plains, many thousands of acres of fertile lands. On the other hand, it would seem that the removal of the forests from certain portions of the mountains would be but an invitation to dry winds to carry with them to unknown regions, large quantities of the moisture which is so much needed by the irrigator, or cause the waters of these portions of the mountains to flow to the plains in floods at seasons when they were not the most needed.

Whatever the beliefs which are entertained on this subject may be—and an effort has been made to state them and the reasons therefor impartially, though this has of course been done imperfectly, since the proper presentation of them would require great time and research—the rapid removal of our forests is actually taking place, and results beneficial or injurious will certainly accompany this change. The ordinary floods observable in our streams may, beyond doubt, be attributed chiefly to this cause. These flood waters, during a portion of the season, are not used directly for irrigation. They will, unless stored, be lost to the use of the

irrigator. To store the excess of flood water will require a great expenditure of money. Before this money can be wisely expended, a great deal of information will have to be collected and furnished the people of the State. It is the policy of other irrigating countries to collect such information, and no doubt will be of Colorado. But this State may delay the securing of this desirable information until after the failures of extensive projects by its citizens, occasioned by lack of this information, shall force the attention of the Legislature to the subject, or, it may profit by the experience of other irrigating countries, rapidly push the collection of statistics pertinent to reservoirs, and be ready to meet in this respect the demands shortly to be made for this information. Of primary importance, in this connection, is a collection of information concerning the water supply; the demands already made upon this supply; the evaporation from water surfaces not only on the plains but in the mountains; the evaporation from the soil; the precipitation throughout the various portions of the State; the character of the sediment in our streams and the laws governing the motion and deposit thereof, and the duty of water in various districts throughout the State.

#### DUTY OF WATER.

By the duty of water is meant the efficiency of a known quantity of water in the irrigation of crops. It is usually expressed in the number of acres that a cubic foot of water per second, running as long as needed during the irrigating season, will irrigate. The cubic foot of water per second of time, sometimes called the *second foot*, has been previously described herein and stated to be the unit of measurement adopted in the distribution of water from the natural streams of the State into the irrigating canals and ditches. There has recently come



into use, though not yet recognized by our laws, a new unit of measurement, applicable more especially to the consideration of water stored in reservoirs, which is designated the *acre foot of water* or *acre foot*. By the *acre foot* is meant 43,560 cubic feet, or the quantity of water which will exactly cover one acre of surface to a depth of one foot. Any statement in which the duty of water in Colorado is expressed as a definite quantity is arbitrary. As previously remarked, the laws governing water under certain conditions, are not applicable to water under different conditions. For example: The observed duty of water in northern Italy, where the mean annual precipitation is about thirty-eight inches, and where the atmosphere, which bathes and in part sustains plant life, is quite humid, can be only very remotely indicative of what the duty of water is or should be on the plains of Colorado, where the mean annual precipitation is only about fifteen inches, and the atmosphere very dry. Since the annual fall of rain on the plains of eastern Colorado varies from about ten to about twenty inches (see table at the close of this chapter), the same quantity of water will not be required each year for the irrigation of any given acreage of crops, or a given quantity of water distributed, under otherwise similar conditions, will irrigate a greater area during the years of maximum precipitation than during the years of minimum precipitation.

Some kinds of crops require more water than others, and the same crops on some soils require more water than on other soils. Two cubic feet of water per second carried on to a field in one body, will, under conditions otherwise the same, irrigate more than twice the area that one cubic foot per second carried alone would irrigate. Many additional statements might be made showing that the duty of water, when expressed in the number of acres that can be irrigated by a second foot of

water running during the irrigating season, differs with each year, each character of crops, soil, sub-soil, etc., in fact with the slightest change in any of the governing conditions.

As there is a demand for *general results* in this matter, it may be stated, relative to the duty of water on the plains of Colorado, measured where distributed to the land, that one second foot, running throughout the irrigation season, in addition to about five inches of rainfall during April and May, and 4.5 inches during June, July and August, if distributed with fair care to diversified crops, on what might be called average land, would irrigate from sixty to seventy acres. It is noticed that, to accomplish this duty it must be measured where placed upon the land. This is not always considered in speaking of the duty of water. A second foot of water diverted from a stream at a point some miles from the land to which it is designed to distribute it, might, by reason of evaporation and seepage, never reach the land. It is sometimes convenient, however, to refer to the duty of water of certain streams or canals, when reference is had to the quantity of water flowing in the stream, usually at its cañon, or permitted to enter the canal. As in ditches of considerable length, twenty-five to thirty miles, it is not uncommon to lose by evaporation and seepage twenty-five to thirty per cent. of the water turned into the ditch, the estimated duty of the water turned into the ditch might be placed at, say fifty acres. But as the ditches are used they lose less water, as a rule, from year to year by percolation; and the lands to which they supply water, need, after several applications of the water, in some cases at any rate, less water than at first; and since as water increases in value it is more economically used, the duty of water, whatever be the locus of the measurement, is continually increasing in Colorado, and it is thought that when distributed with



the greatest care, and in sufficient quantity to be handled without great waste, during the seasons of average rainfall and to crops and soils fairly conditioned for its economical use, that the duty of water should approach ninety acres to the second foot. If the duty of water in connection with some of our streams is considered, it will be found that, notwithstanding all losses by seepage and evaporation, the efficiency of the water can be placed at over one hundred acres per second foot. This is accounted for by the return of much of the water diverted by the upper ditches to the channel of the stream and its re-diversion by lower ditches, so that portions of it are again and again distributed to the land. With more storage reservoirs this duty will be still further increased.

There are methods of distribution by which water can be caused to effect a duty far surpassing that possible with the best surface irrigation, which is the form of irrigation considered above. One of these methods, which is peculiarly adapted to fruit culture and the cultivation of garden vegetables, is that wherein perforated pipes are laid below the surface of the ground and distribute water to the roots of trees and plants. The attention of this department has been called by Mr. F. E. Farish, of Arizona, to the remarkable success obtained by the use of this method of cultivation, applied to his orchards in Yuba county, California, by the late Hon. G. G. Briggs, who has been known to declare that one acre of land irrigated in this way would yield returns the net value of which was equivalent to that obtainable from fifty acres of land irrigated on the surface. Sediment in the water distributed to the perforated pipes, it may be observed, is fatal to the success of this plan, so that the water must be settled before being used.

## EXPENDITURES FROM THE FUND FOR SALARIES OF ASSISTANTS TO THE STATE ENGINEER, FROM APRIL 19, 1887, TO NOVEMBER 30, 1888.

Appropriation for salaries for assistants to the State Engineer for the years 1887-8 . . . . .	\$ 3,000 00
Salaries of assistants paid therefrom . . . . .	\$ 2,794 93
Amount of appropriation for the year 1887 turned back . . . . .	205 07
Totals . . . . .	\$ 3,000 00 \$ 3,000 00

## EXPENDITURES FOR ASSISTANTS TO THE STATE ENGINEER FOR THE YEARS 1887 AND 1888.

Appropriation for salaries of assistants to the State Engineer for the years 1887-8 . . . . .	\$ 3,000 00
Salaries of assistants paid from this fund . . . . .	\$ 2,794 93
Indebtedness for services of the following assistants incurred during 1888:	
John L. Armstrong . . . . .	\$ 50 20
D. E. Welch . . . . .	30 00
G. C. Hoyt . . . . .	16 00
C. A. Kneale . . . . .	17 00
F. M. Roberts . . . . .	25 00
John Pounder . . . . .	35 00
Allen Straight . . . . .	17 00
George Dows . . . . .	17 50
Simon Johnson . . . . .	6 25
C. M. Woodman . . . . .	40 00
E. C. Hawkins, salary for September, \$105; October, \$120; November, \$70; December, \$65 . . . . .	360 00 613 95
Total . . . . .	\$ 3,408 88
Total expenditures in excess of appropriation . . . . .	408 88
Expenditure during 1888 in excess of appropriation for that year . . . . .	613 95
A fee for filing plat and statement sent to this office, and it not being known to whom it should be returned, is in the hands of the State Engineer . . . . .	1 00

The amount of \$613.95, expended during the year of 1888 in excess of the appropriation for that year, has been partly paid by the State Engineer and the balance, with the exception of the salary of the Assistant State Engineer, Mr. E. C. Hawkins, for the month of December, guaranteed by him—Mr. Hawkins feeling so great an interest in the work as to devote his labor to the State during December without assurance that he would receive remuneration therefor. Attention has elsewhere herein been called to the fact that the appropriation made for the State Engineer's office should be greater for the second of two years than for the first, and that

the appropriation is utterly inadequate to meet the demands made upon the office.

Additions to the State Engineer's library, made during the years 1887 and 1888:

Lowell Hydraulic Experiments . . . . .	Francis
Recherches Hydrauliques . . . . .	Darcy-Bazin
Distribuer Les Eaux . . . . .	Grnieys
Water and Water Supply . . . . .	Austed
A Treatise on Hydraulic and Water Supply Engineering . . . . .	J. T. Fanning
Canal and Culvert Tables . . . . .	Jackson
Newton on Levees . . . . .	
Rivers and Canals . . . . .	Harcourt
Hydraulic Manual . . . . .	Jackson
Civil Engineering . . . . .	Rankine
Hydraulic Tables, Co-efficients and Formulas . . . . .	Neville
Land Drainage . . . . .	Klippart
Farm Drainage . . . . .	French
Practical Hydraulics . . . . .	Thomas Box
Draining and Embanking . . . . .	Scott
The Chemistry of Common Things . . . . .	Stevenson Macadam
Drainage . . . . .	H. Mangon
Water Supply . . . . .	Balfour Browne
Hydraulics . . . . .	Geo. A. Ellis
Hydraulic Tables Based on Kutter's Formula . . . . .	P. J. Flynn
Mill Dams . . . . .	Leffel
Essay on Dew . . . . .	Wells
Laboratory Guide for Agricultural Students . . . . .	Church
Well Sinking . . . . .	Swindel Burnell
Storage Reservoirs . . . . .	Arthur Jacob
Water Meters . . . . .	Ross E. Browne
Law of Water for Irrigation . . . . .	S. W. Carpenter
Embanking Lands . . . . .	Wiggins
Flow of Water in Open Channels, Pipes, Sewers, Conduits, etc. . . . .	P. J. Flynn
Chemistry and Essay on Application of Chemistry to Agriculture . . . . .	G. Formes
Experimental Organic Chemistry . . . . .	H. C. Jones
Irrigation and Water Supply . . . . .	Scott
Physics and Hydraulics of the Mississippi River . . . . .	Humphreys and Abbott

These works have been available for reference to any desiring to so use them.

TABLE

SHOWING MEAN ANNUAL PRECIPITATION AT DENVER, COLORADO, BY MONTHS, 1872 TO 1888, INCLUSIVE.

	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	AVERAGE PER MONTH.
January . . . . .	0.55	0.13	0.84	0.48	0.21	1.90	0.10	0.40	0.38	0.50	0.57	2.35	0.22	0.41	0.62	0.67	0.11	.60
February . . . . .	0.22	0.24	0.52	0.60	0.11	0.40	0.48	0.39	0.32	1.22	0.20	0.45	0.86	0.75	0.72	0.30	0.37	.48
March . . . . .	1.71	0.22	0.49	0.39	1.80	1.40	1.82	1.00	0.21	0.87	0.20	0.21	0.93	0.97	2.36	0.23	1.15	.93
April . . . . .	2.09	2.43	1.70	2.24	1.22	2.77	0.05	2.62	0.31	0.50	1.47	3.10	3.33	4.94	2.79	2.16	1.71	2.08
May . . . . .	3.74	0.75	2.43	1.94	8.57	2.30	2.90	3.36	1.11	2.21	2.98	4.30	4.61	2.13	0.09	1.13	2.66	2.77
June . . . . .	2.07	2.24	1.21	0.53	1.10	1.93	2.78	0.32	1.22	0.09	4.96	0.85	1.47	0.66	2.26	0.53	.29	1.44
July . . . . .	2.69	2.00	3.35	4.12	1.16	0.33	1.38	0.64	1.38	2.50	0.66	2.27	0.65	1.33	0.50	2.49	.41	1.63
August . . . . .	1.65	1.41	0.68	1.97	2.03	1.30	2.25	1.38	1.46	2.33	1.20	0.75	1.71	1.18	1.62	2.68	1.51	1.47
September . . . . .	1.57	0.89	1.34	2.89	0.60	0.38	1.23	0.02	0.89	0.57	0.06	1.08	0.13	1.22	0.98	0.97	.11	1.59
October . . . . .	0.68	0.73	0.64	0.22	0.12	2.15	0.80	0.19	1.37	0.32	0.75	1.49	0.21	0.73	0.33	0.97	.77	.73
November . . . . .	0.69	0.16	0.08	1.28	1.50	0.73	0.67	0.21	0.83	1.68	0.71	0.32	0.19	0.55	1.93	0.22	.33	.71
December . . . . .	0.29	0.53	0.17	0.59	1.70	0.79	1.05	0.33	0.10	0.00	0.73	2.32	0.76	1.08	0.87	0.14	.09	.67
Total . . . . .	17.95	11.73	13.45	17.25	20.12	16.38	15.51	10.86	9.58	12.79	14.49	19.49	15.07	15.95	15.07	12.49	9.51	15.10

## TABLE OF ANNUAL RAINFALL

AT PIKE'S PEAK SIGNAL STATION, TAKEN FROM THE SIGNAL SERVICE NOTES No. 7, RELATIVE TO VARIATION OF RAIN-FALL WEST OF THE MISSISSIPPI RIVER.

1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
[35.0]	[48.0]	[22.0]	26.9	24.7	23.9	25.6	43.3	39.8	40.6	44.6	28.8

This station has recently been discontinued. The records are not believed to indicate accurately the precipitation in the mountains of Colorado, for the reason, among many others, that Pike's Peak is very high, and many of the storms occur below the station on the summit.



## CHAPTER IX.

## CLOSING REMARKS AND RECOMMENDATIONS.

While the people of Colorado are to be congratulated on the very fine foundation for an excellent code of irrigation laws, afforded by the accepted doctrine of the courts *that the first appropriator to beneficial use of the waters of a natural stream has a prior right thereto to the extent of his appropriation*, it is to be regretted that the laws on this subject are so ill-arranged and incomplete, and that they fail to effect with any degree of satisfaction the chief end for which they were enacted, namely, to secure the most beneficial use of the waters of the State in the irrigation of lands *consistent* with the protection of prior rights. It is evident that the time has come for the enactment of a comprehensive code of irrigation laws, founded in equity, planned for the future, wide in scope, specific in detail, protecting vested rights and encouraging irrigation development. The histories of other irrigation countries show that the longer the preparation of such laws is delayed, the more difficult is their preparation, the more vexing and intricate their interpretation, and the more complicated and expensive their execution.

If Colorado ever has a complete and effective system of irrigation laws, she will acquire it through the careful study, thorough investigation and persistent labor of a few of her present citizens. It will be the legacy of this to coming generations. Excellency in this matter can only be achieved by men qualified for the work in many ways. Besides earnestness of purpose, harmony of feeling and freedom from prejudice, there must be among



them diversity of talent, for the preparation of such a code calls for the most mature and deliberate consideration of men learned in the law, of men versed in the sciences applicable to the art of irrigation, and of men of wide experience in the practice of irrigation.

This work demands from those who enter upon it, besides natural adaptability therefor, the expenditure of much time and considerable money. It is because the time at its disposal is too limited, that the legislature of Colorado, although it has shown a capacity for effective work in this direction that compares most favorably with any similarly collected body of men, can not meet the demand for the proper treatment of a subject of so vast a range. It is, therefore, urged that the legislature about to convene confine its enactments concerning matters connected with irrigation to those subjects which call most earnestly for attention, some of which are mentioned hereinafter, and that there be created by the legislature a commission, the duty of which shall be to prepare and submit to the General Assembly next convening, a code of laws relative to irrigation. The desirability of such action by the legislature was supported before the reservoir convention, which met in the city of Denver in March of this year, and that convention passed resolutions urging this step by the legislature. If this enlightened State is to have a code of irrigation laws in harmony with its apparent destiny, it must not only appropriate what is best in the laws and practice of other irrigating people, but advance beyond the achievements of the past. This will require, on the part of the commission created, a knowledge of the irrigation laws of other countries, of their effect upon irrigation development, and of the peculiar conditions governing irrigation development in Colorado. That this knowledge covers a vast field, is indicated by the following considerations: While irrigation is an art, it

is closely allied to science; it calls for a knowledge of the functions performed by water in relation to agriculture as well as of the principles governing the flow of water. It will be remembered that water is the chief source of hydrogen and oxygen in plants; that all forms of plant food, including various kinds of mineral, are soluble in water; that the atmosphere bathes and penetrates plants, thus furnishing them with some of the moisture they need; that water flows by virtue of the attraction of gravity; that it flows underground by reason of the stratified condition of the earth's crust; that it carries in solution, by reason of the combining power of its constituents, the elements of which plants are composed; that it carries in suspension detritus, usually of no agricultural value, and frequently injurious to plant life; that stagnant water is detrimental to plant development; that the drainage of water from the vicinity of plants not only relieves them from this stagnant water, but also supplies in some cases additional water to be used in irrigation. If these things are considered, it will be concluded that a knowledge of water, whether as moisture in the atmosphere, rains descending from the clouds, snow or ice in the mountains, whether stored in reservoirs, distributed to or drained from lands, coursing its way in surface or underground channels, or yielding up to the plant its food, should be possessed by the men who take part in the preparation of a code of laws dealing with a substance so vital to our interests, in addition to a familiarity with the principles of political economy, as the wealth and prosperity of the State is to no small extent at stake, and to such legal learning and ability as can forecast the decisions of the court, to the end that the provisions of the code may be, so far as possible, in harmony therewith.

Before referring to the matters connected with irrigation which demand the immediate attention of the leg-

islature, it may not be improper to embody herein remarks on a general policy by which it is believed that irrigation development may be encouraged without incurring the risk of placing the farmers of the State in perpetual bondage to corporations constructing large irrigation works, or yet encumbering the State with the ownership and management of irrigation works, as is now believed by so many to be desirable. The construction and management of canals and reservoirs by the governments of some of the older irrigating nations have, it is true, proved of benefit to agricultural interests, and those in Colorado who favor the State ownership and control of ditches and reservoirs may find strong precedents in favor of the position they have taken, in the success of the works so constructed and managed; but there is danger in drawing precedents from the governmental actions of nations having different political and social conditions from our own. Yet there is a policy embraced in the recent revised irrigation laws of Spain, which it is believed is applicable to the conditions and general feeling of the people of this State. This is the policy by which water privileges, granted to organizations for the distribution of water to the lands of others, are the property of the grantees temporarily, the concessions being for a limited term, at the expiration of which the works and rights passed to the land-owners using the water from the works, and these land-owners and users of water are then intrusted with the management of the works under general governmental supervision. With this policy the general control of the distribution of water may be retained by the State, and at the same time there may be intrusted to the users of water in the different water districts, within certain prescribed limits, the power of regulating the distribution of water to themselves. This is deemed desirable, because, as has become apparent, minute reg-

ulations applicable to an effective distribution of water in some districts, are not applicable to conditions existing in other districts; for example: There are some water districts in the State where, by reason of alkali and other impurities of the soil, the waters of the wells are exceedingly brackish and where it may be advisable to permit the distribution of water for domestic use in irrigating ditches to a limited extent, while in the majority of districts, as heretofore shown, it would be most disastrous to agricultural interests.

It would seem that legislative provisions authorizing and directing the formation of associations, composed of users of water in the various water districts, and vested with certain discretionary powers of directing the distribution of water in the district, but subject to such general laws as are deemed applicable to all of the water districts, would be conducive to the securing of greater efficiency in the use of water than would otherwise be possible, without special legislation. It is possible that it would prove beneficial to provide for smaller associations having supervision over the distribution of water from individual ditches and reservoirs; these associations to be represented by those of their own choosing in the associations with larger powers governing the distribution of water in the district, and these latter associations being represented in a still higher organized body with powers and responsibilities applicable to and commensurate with the control, within prescribed limits of course, of the distribution of water throughout the division. And this view is respectfully presented for the consideration of the legislature, and of the commission, should one be created.

While it is evident that but one unit of measurement should be adopted in the State, we have, besides the *cubic foot of water per second*, what is known as the *statutory inch*. From the repeated condemnations



which the statutory inch has received at the hands of engineers, it at first thought seems remarkable that it should be adhered to with such persistency by so many men of fine judgment among the agricultural people. This partiality for the statutory inch is accounted for, not because the unit of measurement is a satisfactory one, but because there is a desire, and it is common to all irrigating people, for a measuring box or device, and this the statutory inch embodies in its very nature. It is probable that a device that would accurately indicate the delivery of water in cubic feet per second, would be just as acceptable to the farmers as the statutory inch measuring box. It would certainly diminish the complications now existing. It is not believed, however, that any particular measuring device could be constructed, or even described, which would be applicable to all conditions of distribution. Previous efforts to describe such a device have but complicated the subject of distribution. If the commission above referred to, be created, it is recommended that the question be left to their consideration. If it be not created, it is urged that the statutory inch be abolished, and that the legislature declare what the equivalent of a statutory inch shall be, expressed in fractions of a cubic foot per second.

It may be well at this time to refer briefly to a method of keeping accurate record of the water distributed from the natural streams. There is a strong tendency on the part of ditch owners to over-estimate the water distributed by the commissioners to rival ditches. Numerous complaints are received by some of the superintendents of irrigation against the action of water commissioners, and immediate relief demanded, in cases supported only by the statements of interested parties, to the effect that a rival ditch has been receiving water to a greater extent than that to which it is entitled. These complaints demand immediate attention of the

superintendent of irrigation, and sometimes of the State Engineer, and frequently necessitate the calling of the water commissioner from the performance of his duties, to the detriment of the agricultural interests in his district. After such testimony has been received, there is considerable doubt as to the true condition of things, occasioned chiefly by a diversity of estimates as to the quantity of water flowing. There are times, too, in the distribution of water, especially of flood water (of which it is desirable to lose none), when it is convenient to permit the ditch owners to raise at once the head-gates of their ditches, without compelling them to wait until the water commissioner has had time to visit all the ditches in his district in person, by reason of which delay much of the flood waters may be lost. There is a tendency, however, on the part of ditch owners authorized to raise their own gates, to divert more water than permission was granted them to do. It is believed that this can be remedied by the use of an apparatus similar to that used in the measurement of some of our streams, and designated in Chapter I. as "the clock-work register," and described therein, if the same should be placed at the rating flume of the ditch and made to register the height of water at all times flowing through the rating flume. If the rating sheets be placed weekly upon the cylinder by the water commissioner, to whom alone they were accessible, and transmitted weekly to the office of the superintendent of irrigation, to be filed in the office of the State Engineer, a continuous record of the flow of water in the ditches could be obtained, and held open to the inspection at any time of any party interested. If ditches were unduly favored it would be known to the officers of the State. If ditch owners took advantage of any privileges afforded them for the securing of a supply of water in time of floods, that also would be known. Disputes could thus be more readily



settled. Injustice done to any ditch during one week could be compensated for in the succeeding week, and a more equitable and satisfactory distribution generally achieved than is now possible, besides affording a more perfect record of the use made of the waters in the State.

In the light of recent decisions, an *appropriation* of water seems to consist not only in a compliance with the laws relative to filing statements and plats, offering evidence before a referee and diverting water from the natural streams by means of ditches, but especially in the utilization of the water in the irrigation of lands.

If the water of a stream is appropriated to ditches by reason of the actual use of the water by the farmers under the ditch, it would seem to be appropriated to the ditches for the seasons during which it was used. If the ditches already constructed in any district have never utilized the water of the streams of that district at all seasons of the year, it would be no part of a wise policy to regard the waters of the streams of that district as appropriated to the ditches for the seasons of the year during which the waters of the streams had not been utilized. If this be admitted, it is evident that the question of time should be considered in connection with the distribution of the waters of the State, and that it is necessary, in providing for the economical use of all of the waters of a district, not only to know the quantity of water, expressed in cubic feet per second, to which, by virtue of the decrees, a ditch is entitled, but also to know to what extent, in the direction of time, the various ditches are entitled to water. If this is not determined, the State will not know what quantity of water, running during what length of time, is still open to appropriation in any district in the State. There are many water districts in which the quantity of water decreed to the ditches exceeds the quantity of water running in that district during the irrigation season, and

of course exceeds the quantity of water running during the late fall and winter months. The water running during the late fall and winter months has, in many of these districts, never been applied to beneficial use, and unless some provision is made for determining the extent, in the direction of time, to which the ditches in the district embraced in decrees are entitled to water, there will be some hesitancy on the part of those desiring to utilize the unappropriated waters of a stream in the construction of the necessary irrigation works for the storage thereof. Provision by the legislature for the erection at the rating flumes of ditches, of a registering apparatus, similar to that previously described, and to be placed under the charge of the water commissioners, will enable, if operated during the entire irrigation season, the State Engineer to know with reference to each ditch, not only the entire quantity of water carried by that ditch during the season, the maximum and minimum flow of water in that ditch during the season, but also the average quantity of water carried during the irrigation season and the number of days during which water is so carried, so that even if no law is enacted providing for the determination by the courts of the length of time during which ditches are entitled to divert water from the streams for direct irrigation (*i. e.* without embracing storage privileges), it will be possible for this department to make known to inquirers the approximate quantity of water not actually utilized, in any district, through irrigation canals.

#### MATTERS DEMANDING THE IMMEDIATE ATTENTION OF THE LEGISLATURE.

It will be noticed, by an examination of the Drainage Plat of the State in Part II. hereof, that a very considerable portion of the State is not embraced in either water districts or water divisions. It is desirable that

the entire State should be divided into water districts at the next session of the legislature, for the reason that thereby will be occasioned a convenient basis for the arrangement of irrigation statistics, and because the development of the State is progressing so rapidly that every portion thereof will probably find it desirable to be embraced in a water district before the legislature convenes again. The water divisions and water districts heretofore created, require the attention of the legislature, being defective, as indicated by the following considerations:

Water Districts Nos. 1, 43 and 44 are entirely too large. The water commissioners are not able to distribute water throughout these districts without incurring a great expense.

The district designated as No. 30 is also known as No. 32, and this is inconvenient.

There were during the past two years urgent petitions made to the Governor for the creation of Water Districts Nos. 23 and 45. These districts were created in response to these petitions, and in accordance with the power conferred upon the Governor by the legislature, but it is deemed desirable that the creation of these districts be confirmed by the legislature.

The boundaries of Water District No. 20 are somewhat in doubt. This district, by the last legislature, was stated to consist of old Water Districts Nos. 20 and 23, but when more particularly described, certain tributaries of the Rio Grande embraced in these old districts were omitted.

A petition has been received for the creation of a water district embracing the lands irrigated by water taken from the San Francisco creek and its tributaries, in Rio Grande county, and it is recommended that this stream be embraced with adjacent streams in a water district.

It is somewhat questionable whether District No. 14 includes the St. Charles and its tributaries, and the Huerfano and its tributaries.

Numerous letters have been received from residents of North Park, asking the recommendation by the State Engineer of the creation of water districts in that portion of the State. The recommendation is here made and it is advised that there be created two water districts in North Park, one embracing the North Platte and its tributaries above the mouth of the Michigan river, and the other embracing the North Platte and its tributaries in the State of Colorado below the district above mentioned. There is said to be situated in North Park about 100,000 acres of hay lands that can be irrigated from the streams of the Park. It is recommended that Water Division No. 1 be extended so as to include these districts, and a district that should be created embracing the Big Laramie river and its tributaries in Colorado.

Requests have also been especially made for the recommendation of the creation of a water district to include the lands irrigated by water taken from the Muddy (a branch of the Grand river) and its tributaries, and that also is done.

It is provided in the laws that the time which water commissioners must serve shall not exceed eighty days. It is also provided that water commissioners may be called out at any time the superintendent of irrigation may deem it necessary. The past two years have shown that eighty days will not cover the length of time during which the services of water commissioners are needed in many of the water districts. The boards of county commissioners, with one or two exceptions, have cheerfully paid for the services of the commissioners when called out by superintendents of irrigation, notwithstanding the eighty days mentioned as the time of service permissible had been exceeded. Water commissioners should be allowed



their traveling expenses in addition to their salary, and provision should be made for the examination of commissioners before their appointment.

A penalty should be attached to the failure of ditch owners to comply with the law requiring the erection of rating flumes and head-gates in their ditches, and there should be a severe penalty connected with the interference of head-gates after they have been arranged by the water commissioner.

There should be conferred upon the State Engineer the power to appoint deputies. It should be made a duty of the Attorney General to advise the State Engineer in matters connected with his department, and defend him, should necessity arise, as has arisen during the past two years, by reason of his official action. Attorney General Marsh, during the two years just passed, though not required by law, most kindly advised, and in some cases defended the officers of this department; so that this recommendation is made, not because necessity therefor has occurred, but because necessity therefor may occur to future incumbents of the office.

It is desirable that provision be made for the re-adjudication of ditch rights in certain water districts, where the law has not been complied with.

It is suggested that, as reservoir construction is becoming quite rapid in the State, there be created the office of inspector of reservoirs, and that laws be enacted looking to the protection of those living below and liable to injury from the breaking of dams and reservoirs.

A very considerable increase of the appropriation for assistants to the State Engineer is necessary, to enable that officer to perform the duties now intrusted to him. The same end may, in part, be accomplished by authorizing the State Engineer to charge a fee, sufficient to cover the expenses of filing, tabulating and exhibiting

upon demand, the statements and plats filed in his office.

It is suggested that, in place of making an equal appropriation to the office of the State Engineer for each of two years, the appropriation be made greater for the second than for the first year; that the appropriation not only include funds for assistants, but also for materials, as materials are needed in the establishment of gauging stations upon the streams.

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