ASSISTANT CHIEF
BUREAU OF IRRIGATION

TENTH BIENNIAL REPORT

OF

OFFICIAL OFFICE COPY

The State Board of Irrigation
Highways and Drainage

TO THE

GOVERNOR OF NEBRASKA

September 1, 1912 to September 1, 1914

TENTH BIENNIAL REPORT

OF

The State Board of Irrigation

Highways and Drainage

TO THE

GOVERNOR OF NEBRASKA

September 1, 1912 to September 1, 1914

The Claflin Printing Co., University Place, Nebr.

OFFICE OF THE STATE BOARD OF IRRIGATION, HIGHWAYS AND DRAINAGE

To His Excellency, John H. Morehead, Governor of Nebraska:

Sir:—I have the honor to submit herewith the following report of the work of this office during the past two years. Attention is called to the Hydrographic Report.

Yours very respectfully,

DONALD D. PRICE,

State Engineer,

Lincoln, Nebraska.

September 30, 1914.

SCOTTS BLUFF, SCOTTS BLUFF COUNTY, NEBRASKA

LIST OF OFFICERS OF STATE BOARD OF IRRIGATION, HIGHWAYS AND DRAINAGE, STATE OF NEBRASKA

Members of Board

JOHN H. MOREHEAD, Governor, President.
GRANT G. MARTIN, Attorney-General.
FRED BECKMANN, Commissioner of Public Lands and Buildings.

Office Force

DONALD D. PRICE, State Engineer.
C. P. MASON, Assistant State Engineer.
L. W. ERICKSON, Assistant Bridge Engineer.
GEO. K. LEONARD, Bridge Inspector.
W. F. CHALOUPKA, Bridge Inspector.
J. G. MASON, Bridge Inspector.
D. P. WEEKS, JR., Hydrographer.
MISS LAURA E. DARROW, Chief Clerk.
C. E. THORNTON, Stenographer.
W. M. JEFFERYS, Clerk.

Water Superintendents

R. H. WILLIS, Water Division No. 1, Bridgeport, Nebraska.
PAGE T. FRANCIS, Water Division No. 2, Crawford, Nebraska.

Water Commissioners

P. C. WADE
J. C. McCOY
G. F. PALMER
H. C. SCHADE
R. A. BLAKE
ROBT. OSBORNE
JAS. FERRIER
J. H. O'KANE
TOM GASS
JAMES D. SPEARMAN
M. J. GAYHART
WM. WILLIS
C. A. LILJENSTOLPE

WATER DIVISIONS AND WATER DISTRICTS.

Section 6780 of Cobbey's Annotated Statutes:

Irrigation and Water Power.—Water divisions:

"The State of Nebraska is hereby divided into two water divisions, denominated Water Division No. 1 and Water Division No. 2, respectively."

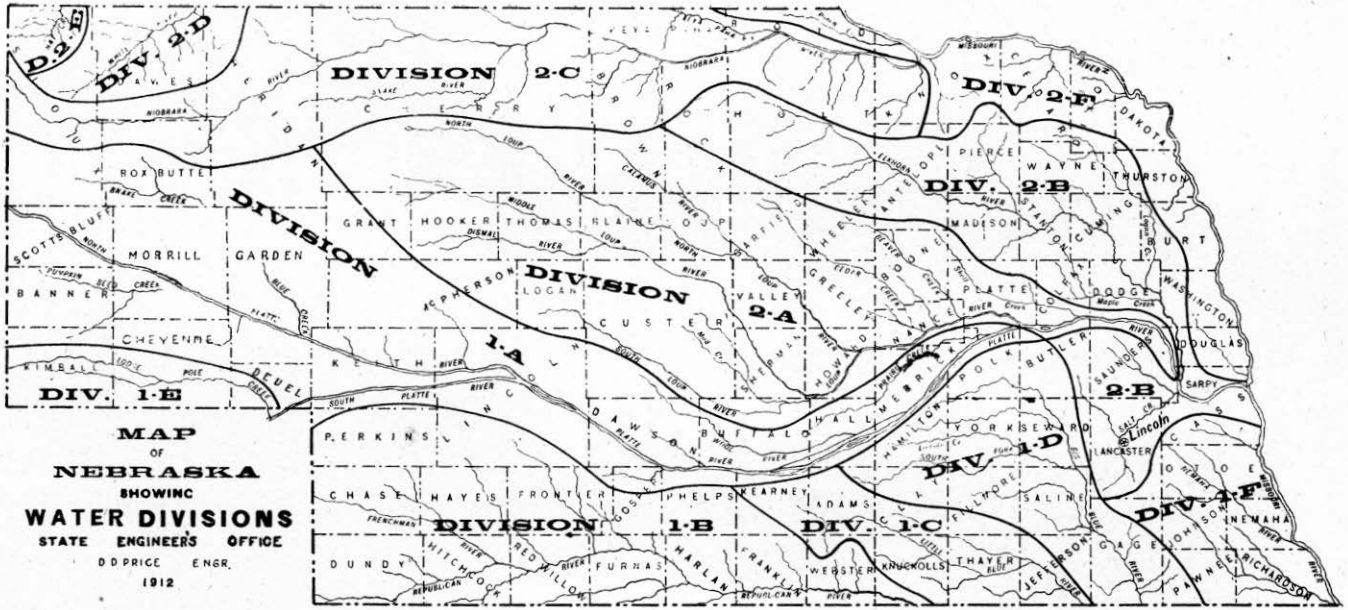
Section 6781—Boundaries of Division One:

"Water Division No. 1 shall consist of all the lands of the state drained by the Platte River; and also all other lands lying south of the Platte and South Platte rivers that may be watered from other superficial or subterranean streams not tributary to said Platte River."

Section 6782—Boundaries of Division Two:

"Water Division No. 2 shall consist of all lands that may be watered from the Loup, White, Niobrara and Elkhorn Rivers and their tributaries and all other lands of the state not included in any other water division."

For convenience in the adjudication of claims and in the distribution of water these divisions have been subdivided into twelve water divisions denominated 1-A, 1-B, 1-C, 1-D, 1-E, 1-F; 2-A, 2-B, 2-C, 2-D, 2-E, 2-F, as shown on the accompanying map.


DIV. 2-D
DIVISION 2-C
DIV. 2-F
DIV. 2-B
DIVISION 1-A
DIV. 1-E
DIVISION 1-B
DIV. 1-C
DIV. 1-D
DIV. 1-F
2-A
2-B
Lincoln
MAP
OF
NEBRASKA
SHOWING
WATER DIVISIONS
STATE ENGINEER'S OFFICE
D D PRICE ENGR.
1912

IRRIGATION

Irrigation throughout the state for the past two years has been carried on under average conditions. There has not been an abundance of water throughout either of the past two seasons, nor has there been what might be called an extreme shortage. At certain periods of the irrigation seasons there has been a quantity of water run to waste in all parts of the state. Also during parts of the seasons there has been shortages of water in the many streams for use for irrigation purposes, which shortages seemed at the time to be very acute and extreme, but when one stops and studies the conditions that have existed in the state since irrigation has been practiced it can be readily seen that the average conditions have prevailed during the past two years.

The rainfall has been such in the central and western portion of the state as to impress upon the farmers the great benefits to be derived from irrigation and there has been a great deal of talk and interest developed and shown in the re-opening, re-organization and rebuilding of old canals which had of late years fallen into an unused condition, and in several instances there has been considerable talk of building of entirely new projects. Perhaps the largest canals which recently have been re-opened lie in the Platte valley between North Platte and Kearney, while the largest proposed new project is known as the Tri-County project, comprising parts of Gosper, Kearney and Phelps counties.

Numerous small ditches have been built throughout the various irrigated sections of the state. In all there have been forty-six applications allowed for irrigation purposes, a great percentage of which have been either built or are under construction. There have also been many applications made for small reservoir sites, which have been built, the idea being to impound the water during the winter flow and spring floods and use the same on the land when it is most needed for raising of crops. Also many of the ditches have been built with the one idea of getting water on the land in the early fall and spring, and also at times of flood. In this way the sub-soil is wet up to a considerable depth which assures the raising of fairly good crops no matter what the season may be. Small ditches of this class are mostly found in the northwestern part of the state in Hat Creek and White River drainage area, where the summer flow is small and limited, but where the spring run-off is considerable.

There is still a large amount of water going to waste in the differents streams of our state, which could be used for further development of irrigation interests. Undoubtedly our water users have not realized to the fullest extent the benefits which might be derived or which will

probably be derived from the water resources which we now have available. In many cases the diversion dams from the stream are not in proper shape so as to adequately divert their portion of the water. Especially is this true at the season of the year when the water is very low. In other instances the ditches are in poor shape and considerable waste of water takes place while the same is being transported from the stream to the land where used. Then also there is a large percent of waste in some localities by the irrigator himself in the distribution of the water over the land while applying the water to the crop.

Some men make the water go farther than others and receive greater benefits. Sometimes too much water is used and sometimes not enough, but from the experiments that have been performed and the information that is available together with actual experience on the ground, the irrigator should be amply able to inform himself on this subject.

In driving over the state during irrigation season one often comes upon a place where the water from an irrigation lateral has been set to run over a piece of alfalfa or grain and the irrigator has gone away and has temporarily forgotten about it. Perhaps the lateral has broken or in some way the water has gotten across the field and is running upon the highway collecting in low places and making the road nearly impassable, and wasting a considerable amount of water. From this practice alone a large amount of water is wasted yearly. The time is fast approaching when the value of water will be such that everyone will deem it necessary to keep a man with a shovel on the job with the water, while irrigating, in order to get over the most land and to get the best work, thereby gaining good results.

The Legislature of 1911 passed a law making it compulsory for every person, corporation or association owning or controlling any ditch, canal or reservoir for the purpose of storing or using water for any purpose whatever to construct and maintain a substantial headgate at the point of diversion of a design approved by the State Engineer, and so built that it may be closed or partially closed and fastened at any stage with a lock or seal. Notices were sent out by mail from this office in April, 1911, to every ditch and canal owner as the same appeared upon the records of the State Board to comply with this section of the new law. As yet, however, very few canals have complied with this section of the statutes and it has been very hard to operate the gates in some of the canals in the distribution of the water as required by law for this office to do. Some of the old headgates and diverting works are in such shape that it is absolutely impossible to stop the water from flowing into the canals without the building of a dirt dam across the same. This measure was resorted to in a couple of instances during the past season.

The law above referred to further states that shall the person, corporation or association neglect or refuse for a period of ten days to put in such headgate and measuring device the Board shall refuse to allow

any water to be used through or by such ditch, canal or reservoir and if the State Board deem it necessary they may construct fills or dams or other obstructions to prevent such delivery or use. The officers in direct charge of the supervision of the delivery of water have been relunctant to enforce this provision strictly, realizing the hardship to be worked upon the water users under any canal which neglected to comply with the above section by putting in a substantial headgate as required, and further realizing that in order to comply with the section it was necessary for the expenditure of considerable money in some instances, they have put up as best they could with the structures that the canals have seen fit to use since 1911. However, it would seem as though four years has been plenty of time to allow for every canal to either repair or put in a new headgate such as to comply with the state law. Some companies are either very dilatory or else they are showing such absolute indifference to the requirements that it is feared that they will over tax the patience of this department. It is to be hoped that every canal that has not complied with this part of the law will promptly do so during the non-irrigating season, so that when the season of 1915 begins every canal will be in shape and properly equipped with headgates and measuring wiers. At present it is the intention to refuse water to every ditch that has not complied with this requirement beginning with April 1, 1915.

This same section also covers requirements relating to measuring devices. The time has come when all water diverted from streams in this state must be measured to the user and each user get exactly what he is entitled to and no more or no less. As soon as a measuring device as provided by the above section in conjunction with the headgate has been installed this office is ready to make an accurate gaging of the same and furnish the ditch operating it with a discharge table so that for given gage heights the ditch owners will know exactly how much water they are getting. This will greatly aid this department in overseeing the delivery of water. The penalty for non-compliance with this section is rather severe but it is to be remembered that in the future it will be strictly complied with.

Pursuant to the recommendations of this department in the Ninth Biennial Report a bill was introduced in the 1913 session of the Legislature asking for an appropriatoin of $20,000.00, to be used in establishing beyond doubt and protecting water rights on streams entering this state regardless of state lines. This bill, however, was entirely overlooked, and never got out of the House.

There is now pending in the Federal District Court at Denver, a suit by Samuel G. Porter of Haigler, Nebraska, to establish the priority of a right of an old ditch which has been built for a good many years, diverting the water from the Republican River in Colorado and watering land both in Colorado and Nebraska. Mr. Porter had his right adjudicated in Colorado and his right established in so far as the land in Colorado was concerned, but Colorado refused to allow any priority for lands

watered in Nebraska. Mr. Porter has had his right also adjudicated in Nebraska before this Board for the land which is in Nebraska and now he is trying to establish the priority to use of the water regardless of state lines. It is to be regrettted that Mr. Porter is having to make this fight by himself. Such an important fight as this should receive the full support of the state of Nebraska as it will be a precedent that will be hard to overcome if Mr. Porter loses the suit and one that will be well worth while if he wins it.

There is also still pending the case of Wyoming vs. Colorado on the upper Laramie River in which Nebraska is interested and should be represented. It is to be regretted that a state like Nebraska to whom irrigation is of so much importance, should hesitate to appropriate a sufficient amount of money to protect its people from the aggressive water users of adjoining states to the west.

It is recommended that if no specific appropriation is made for this purpose during the coming session of the Legislature that suffiicent amount of money be added to the Attorney General's appropriation that he may proceed at once to intervene in these suits in order to better protect the interests of our irrigators and to also authorize the beginning of a suit for the adjudication of the water rights on both the South and North Platte Rivers.

Accurate gaging stations have been established and kept up during the past biennium at the State Line on the North Platte River, at Julesburg, Colo., on the South Platte River, and at the State Line on the Republican River. No doubt some day this information will be valuable and of great assistance to the state.

The return flow of water by seepage and other means from irrigated sections will soon be a very important factor in this state. The South Platte River has caused some surprise during the past season when it flowed a large quantity of water during the early part of the irrigation season. In July this flow dropped to practically nothing at North Platte, but even during the hot dry weather of August, water could be seen in small channels east of Ogalalla. The flow in the early part of the irrigating season was undoubtedly caused by heavy rains and floods in the upper stretches of the stream and all the reservoirs in Colorado being full the surplus flood was allowed to come down. But the flow, though small, which was passing Ogalalla during the month of August can only be accounted for by reason of return seepage water from irrigated land along this valley in the eastern part of Colorado and the extreme western portion of Nebraska. Undoubtedly in time this flow in the South Platte Valley will increase, returning to the stream so far down that it will be impossible for use in Colorado, thus Nebraska will receive the benefit.

This same return flow of seepage water has already shown itself in various other streams of the state and especially is this true in the North Platte River in Scotts Bluff county where the large areas have been brought under irrigation by the numerous ditches including the

larger acreages under the Tri-State and Government Canals. In this locality there are now streams of water varying in quantity from five to fifty second feet where a few years ago it was merely a ravine or canyon down which for a short distance the water from springs would run and perhaps in times of heavy rains or flood the water would reach the river. Drainage ditches have been built so as to keep this water from spreading over the low land and carrying it to the river by a more direct route than the old water course.

The Legislature of 1913 passed a bill granting the right to anyone to collect or assist to collect any seepage water under any canal or an adjacent canal and to use the water so collected upon land covered by an original appropriation of the canal under which the water was collected while the same was being conducted toward the natural streams. It also limited the amount of water to be used on a piece of land to three acre feet and provides that it does not exceed the amount originally appropriated therefor, and further that when any seepage water was mingled with that of any natural stream it became the property of the state and subject to appropriation as provided by law.

Upon this bill being passed a number of applications were at once filed in this office, asking for the right to appropriate what the claimants called seep water. It is to be remembered while discussing this point that practically all of the present drainage ditches from the point where their well defined banks in the canyons left off to the North Platte River has been constructed prior to the passage of this law and were in operation, the water flowing from these through to the river, and that the water had become mingled with that of the springs which had been there prior to any irrigation in the country. Therefore the water was gathered up and kept in a well defined channel while seeking its way to the river, instead of being allowed to spread out and seep up a considerable area of ground as it naturally would have done owing to the topography of the country. It would be entirely proper to allow these applications for appropriations of seep water as an additional or supplemental appropriation to the lands which they seek to water but they should be governed by the law of priority which was an earlier law and by which all the irrigation rights are gaged in this state. If for any reason the law of priority is discarded or gotten rid of in any way it is going to work against the best interests of the state as a whole.

Undoubtedly appropriations have been asked for and granted to water users on the North Platte River in excess of the natural flow of the stream and also it must be admitted as an undisputed fact that the appropriators of the later applications have had in mind the fact that the flow of the river would be increased by return seepage at some future time. Therefore it is not at all improbable that large expenditures have been made for ditches at a time when an adequate water supply was not available, and depending upon nature to assert itself as it had in other irrigated sections (such as irrigation has done on the Poudre River in Colorado) these people had every reason to believe that their

water supply would become better as time went on due to return flow of seepage. Then it would not seem just to allow water users who had a fairly early priority in addition to their original appropriation from the river to use this return flow of water before it reached the river unless their priority had given them this right. For these reasons and also that the land desired to be watered by the above mentioned applications by seepage water was also covered by a prior appropriation the applications were dismissed and appeals have been taken and the cases are on now for a hearing before the State Board.

It will not be denied that the intent of the law is to give a person under a canal the right to go out and drain seeped lands and use the water so collected before it returned to a natural stream, for irrigation purposes but it would seem that the spirit of the law it not the letter had been over reached in the attempts to keep this water. It is recommended that the next session of the Legislature change this law so as to make it more clear in regard to the meaning of the same and also to make the law workable.

The number of irrigation districts is steadily on the increase, a number of the old canals having changed their form of operation from a mutual company or corporation to a district, so that now a majority of the larger ditches are under this system of operation. This, of itself, speaks best for the irrigation district law of Nebraska.

There are, however, a few changes in this law which are recommended for consideration.

First: That the law be changed so as to make it the duty of the county treasurer to keep an exact record of the date of the bond issue, the amount of said issue, to whom the bonds were issued, the amount of the levy for interest on bonds, the amount of the levy for payment of principal of bonds, the amount of taxes collected for payment of interest, the amount of taxes collected for payment of principal, and the amount of taxes collected for maintenance and operation. Said county treasurer should also keep a record of the coupons that are presented for payment and to whom he pays the money on said coupon. In a few of the counties where irrigation bonds are handled the county officers keep a record of this sort, but as it is not compulsory many of them fail to do so, and it is next to impossible to ascertain the amount of unpaid bonds outstanding against the district, or the amount of the issue or who owns the bonds from the records in the county offices and as the county treasurer handles this money for the district and is paid for the same it would seem only proper that a complete record of the entire transaction should be kept for public inspection.

Second: The present district law requires a copy of the original petition for the formation of the proposed irrigation district together with all maps and other papers which are filed with the county commissioners of the county in which the district is formed to be filed with the State Board of Irrigation, Highways and Drainage, and makes it the duty of the State Engineer to examine into said petition, maps and

papers and make such a report to the county commissioners as he deems advisable to submit. Then it further gives the Board of County Commissioners the right to change the boundaries of the districts in any way they see fit and in this way the original plans as reported on by the State Engineer can be changed.

It is recommended that the law be so changed as to require the district to file a map with the State Engineer showing the exact location of the boundaries of the proposed district as the Board of County Commissioners has passed upon the same and receive the approval of said officer before they can hold an election for the forming of said district. And further that at any time in the future that the district is changed that a map showing such changes shall be filed in the office of the State Board that the records may be kept up to date and show the conditions as they exist.

It is also recommended that the report required from the State Engineer upon the proposed bond issue of any irrigation district shall be received and shall be favorable to said bond issue of any district before a vote is taken upon the proposed issue.

The special attention of water users is called to the fact that many water rights have been taken out in the names of certain parties who have later conveyed them to other persons. The purchasing parties have failed to have their deeds to water rights recorded in the office of the State Board. This leaves the right on the records of the State Board in the name of the original owner. Many notices are sent out which are of vital interest to water users and of course the mailing list used is that showing the names and addresses of water users on the records of the office of the State Board. Where water rights have been changed the party who is now interested fails to receive the notice. Special stress has been laid upon the recording of these transfered rights during the past two years and the records are gradually being brought into proper shape. Everyone interested in this matter, however, is requested to look over the Biennial Report and see that the water right that they are interested in stands in the proper name. If not at once correspond with this office and see what should be done in order to have the change made.

The past irrigation season was the first one in which the officers in charge of the supervision of the delivery of water tried to get water down to the Kearney Water and Electric Powers Company's canal near Kearney, whose right was adjudicated during the past biennium and as determined by the State Board had a priority of September 1, 1886, and also granted one hundred forty cubic feet of water per second for power purposes and twenty-two second feet of water for irrigation purposes. Appeals from the decision in this matter were taken direct to the Supreme Court in accordance with the law of 1913, by both parties of the case and the decision of this Board sustained by the Supreme Court.

Under the findings of the State Board it was necessary for the state officers to see that the Kearney Canal was protected in their right to

the use of water as found in the Opinion handed down. No prior records were available on the handling of the stream as far down as Kearney, and it was practically guess work as to the amount of water which would have to pass Bridgeport and North Platte in order to furnish Kearney with the required amount of water for the past season. The weather conditions are such a strong factor governing the amount of water which is necessary to have passing both Bridgeport and North Platte that even with the records of the past season it is not possible to figure accurately the exact amounts. For instance, on August 6, 1914, there was several hundred feet of water passing the headgates of the Kearney Canal in excess of what they could use. On August 9, the river at Kearney was absolutely dry. No water was available for use by the Kearney Canal, yet during this period there had been from nine hundred fifty to twelve hundred cubic feet of water passing our gaging station at North Platte, and the intervening ditches between North Platte and Kearney were using not to exceed three hundred forty feet. This extreme decrease in the flow of the river is easily accounted for considering the wide expanse of the river bed and the four days of exceedingly hot south winds on August 6th, 7th, 8th, and 9th.

A report of Water Commissioner McNamara at North Platte contains the following statement: "My experience as Water Commissioner this season shows that we cannot supply water to the four irrigation ditches east of North Plattte and keep enough water flowing under the Elm Creek bridge for the Kearney Water and Electric Powers Company, with a volume here at North Platte of one thousand second feet unless weather conditions are favorable."

There are appropriations between the State Line and Bridgeport covering 3900 cubic feet per second; between Bridgeport and North Platte there are appropriations covering 2030 cubic feet per second; and from North Platte east to Kearney there are appropriations covering approximate five thousand fifty cubic feet per second. From this it can be seen the approximate proportion of water used in the different territories and the way it is divided. It will be remembered, however, that practically all of the ditches between the State Line and Bridgeport are alive and use water to the full amount of their appropriation. There are several ditches between Bridgeport and North Platte, which have not been in use during the past few years, and for this reason all the water provided for in the above statement between Bridgeport and North Platte during the past biennium was not used.

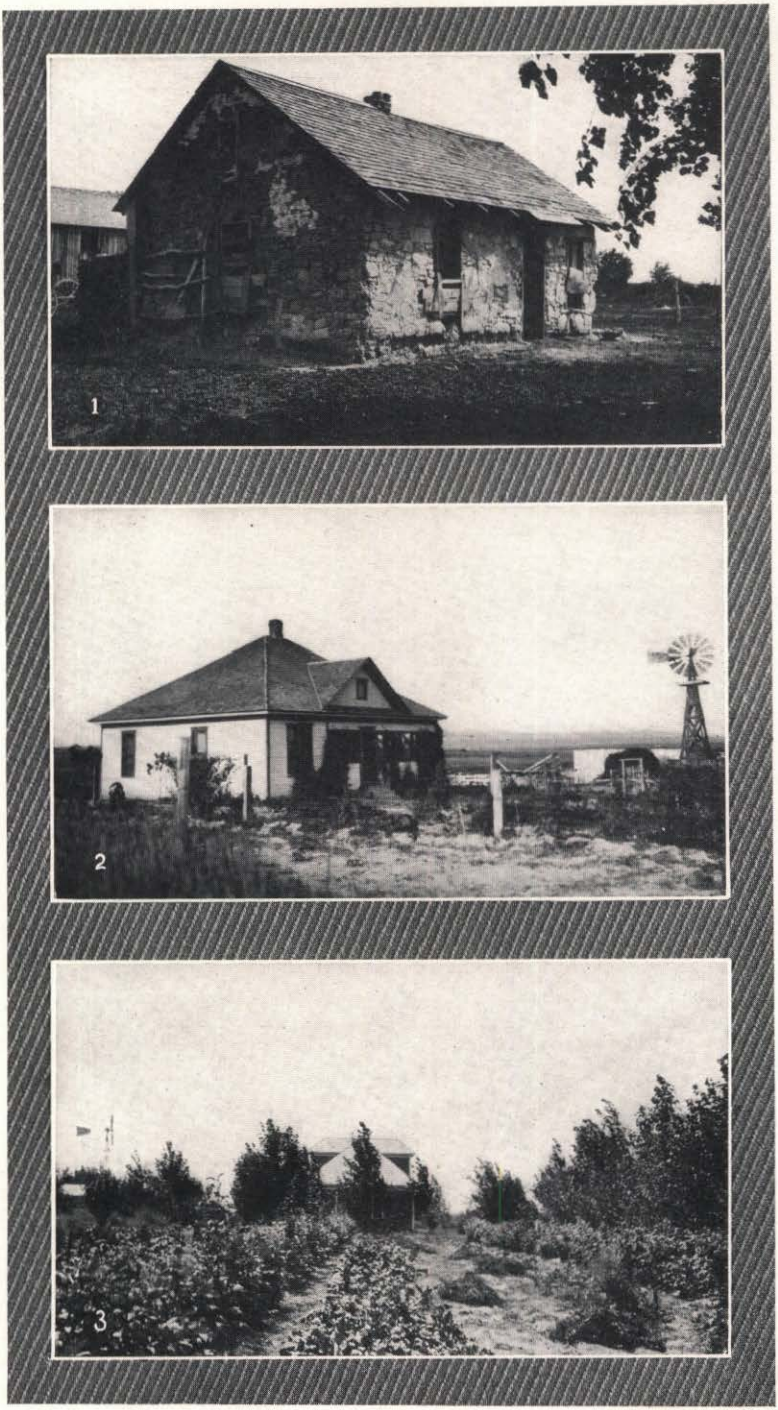
Also while there are appropriations covering appproximately five thousand fifty second feet between North Platte and Kearney, it has only taken about one thuosand cubic feet of water to take care of these during the past season. However, as spoken of before, there are several large ditches between North Platte and Kearney, which are being reopened and put in proper shape to use the water for irrigation purposes. The old Lexington Canal used a considerable amount of water when the same was available during the past season. This is one of the largest

canals in that territory, and it is thought that by the example of the benefits derived from the irrigation carried on during the past season that a larger acreage yet will be brought under this canal during this coming year.

It is also a fact that the irrigated acreage under the Gothenburg, Cozad and Six Mile canals has increased and considerable additions are expected for next year. Water was being used by all of these canals as late as the latter part of October, wetting up the ground for next year, because there was plenty of water in the river at that time. Work is now being carried on cleaning out and repairing the old Gothenburg South Side canal which irrigates a large acreage just south of Gothenburg. It is expected to have this canal ready for operation early next spring. These ditch companies have become convinced that it will pay them to operate their canals even though they only get water during the early spring and late fall months and perhaps for short periods of floods during the irrigating season.

It is conceded by all that the Pathfinder Reservoir is a wonderful improvement to the territory which it serves and that the benefits to be derived therefrom are nearly unlimited, when the reservoir is properly managed. It is also conceded that this reservior should store all the waste, surplus and unused water of the North Platte River that it possibly can for use for irrigation purposes during that portion of the irrigating season when the natural flow of the river is not large enough to meet the demands and needs of the water users. The greater part of this reservoir is filled from the run off and floods between April 1st and July 1st of each year. The irrigation season begins April 1st. Many irrigation companies, however, do not have their canals cleaned out and in readiness to carry water by that time of the year but are dilatory in this matter and perhaps the country is favored with a few spring rains during the month of April and water is not absolutely needed until about the middle or latter part of May when weather is liable to turn out hot and dry and all of the canal companies desire to draw water at once. Perhaps up to this time there has been what seemed to be plenty of water in the river, the most of which has been coming into the North Platte River from the Laramie River and other tributaries this side of the Pathfinder Reservoir, which is probably storing all the water available at that time. It can be readily seen from the total amount of the appropriations above given that if nearly all the canals began drawing approximately their full amount of water, there would be a very sudden drop in the river and perhaps a shortage and in some cases the river goes entirely dry. This has occurred at different parts of the years, for the past two seasons generally occurring between the 28th of May and the 10th of June. However, this year it did not occur until the latter part of June.

In order to better overcome this it is recommended that a law be passed requiring every canal company desiring to draw water to give a notice of the same stating the time at which they desire to draw water



VIEW SHOWING IMPROVEMENTS IN FARM HOUSES SINCE TERRITORY HAS BEEN BROUGHT UNDER IRRIGATION

and the amount they desire, to the superintendent of the water division in which they are located. This notice should be given to the Superintendent at least ten days prior to drawing water. This allowance of time is absolutely necessary in order that notices can be given to the Reclamation Service to let by so much of the natural flow of the river to take care of the Nebraska appropriators and in order for the water to get from the reservoir to the point of diversion.

There are also numerous floods which may either be caused by rainfall or the breaking of a large canal which arise below the Pathfinder Reservoir and thus are not controlled by it. Sometimes these floods occur when there has been a shortage of water and a large portion of the headgates of canals are closed down in order to furnish water to prior rights. By the method employed now it is a physical impossibility for a water commissioner to get around and serve notices on the different canal companies that they may open their ditches and use to their full capacity of the flood that is going down. During the past season a large quantity of water went past closed ditches notwithstanding the honest endeavors of the state officers to serve notice and allow the canals to use this water. It is therefore recommended that some change be made in the law whereby irrigation companies are placed upon their honor and authority be given to the superintendent of the Water Division to telephone any officer of any company and instruct him to either open or close the headgate of their canal as the occasion may demand. In this way when a flood happens every canal company can have their ditches open within a couple of hours and receive benefits to the full extent of any water that happens to come down. Also it will enable the State Officers to get quick action in closing the canals. This method of procedure is followed in other states where irrigation is practiced and there is no reason why it should not be followed in Nebraska. It must be admitted by all that there must be state supervision over the delivery and division of water for irrigation purposes and if this is conceeded, the choice of the manner in which the supervision is to be carried out must undoubtedly be for that way in which the results may be obtained the most quickly cutting out all red tape.

The former recommendation of this department that Water Commissioners be paid direct by state appropriation instead of by counties failed to pass at the last session of the Legislature. Scottsbluff county is the only county in the state of Nebraska that makes trouble in paying the Water Commissioners and refuses from time to time to settle for such work. This attitude of the officers of Scotts Bluff county will no doubt be a surprise to a large majority of the people of the state when it is known that this county has more irrigated land in it than any other county within the state; that more time is spent by this department supervising irrigation in it than in any other county within the state; and that the supervision and delivery of water to the different ditches according to their priority in this county means so much to the county. Some

way should be worked out by which water commissioners could either be paid by a different manner or else to insure them of prompt payment for their services, by the county in which the work is done.

Several canal companies during the past irrigation season refused to close their headgates and keep them closed when ordered to do so by officers of the state in order to furnish water to prior appropriators. In other instances gates were opened before permission was granted for doing the same thus in reality in both instances stealing the water they were not entitled to. This was done notwithstanding the fact of the severe criminal penalty for such actions. It is conceded in certain portions of the state that criminal prosecution could not be maintained against an irrigation company or its officers for refusing to follow the orders of officers of the State Board. This is a deplorable check and it is suggested that some change be made in the law whereby the penalty should either be changed, and the penalty fixed so that it would be workable and enforceable or the present law regarding criminal procedure changed so that the State Board in its criminal cases against water users could procure a change of venue. One thing is certain and that is that a more enforceable procedure must be secured.

Since the Government Reclamation Service offered for sale storage water from the Pathfinder Reservoir, over two years ago, there has been only six contracts entered into for permanent storage water rights.

On August 20, 1912, the Farmers' Irrigation District (Tri-State Canal) purchased a guaranteed flow of aproximately 180,000 acre feet. It was estimated by the Reclamation Engineers that the original appropriation of the Tri-State Canal would furnish at least 80,000 acre feet during the irrigation season, thus they in reality sold the Farmers' Irrigation District (Tri-State Canal) approximately 100,000 acre feet of stored water at a cost of $5.00 per acre foot, amounting to $500,000.00. According to the contract entered into the delivery of the stored water can be so changed as to best suit the demands of the purchasing company.

On March 6, 1913, the Chimney Rock Irrigation District purchased from the government a guarantee of 10,300 acre feet, of which the engineers of the Reclamation Service estimated that according to the priority of the appropriation of the Chimney Rock Canal, it would be supplied with 3,720 acre feet per season, leaving 6,580 acre feet which the government sold, at $5.00 per acre foot or $32,900.00.

In the same manner the Browns Creek Irrigation Canal entered into a contract with the government under the date of July 14, 1913, for a guarantee of 19,900 acre feet, of which the engineers of the Reclamation Service estimated that 7,520 acre feet would be furnished by the original appropriation leaving 12,380 acre feet which the canal company actually purchased at $5.00 per acre foot or $61,900.00.

Under the date of March 6, 1913, the Beerline Irrigating Canal Company purchased from the government a guarantee flow of 2,800 acre feet, of which the engineers of the Reclamation Service estimated that

750 acre feet would be furnished under their original appropriation, so that the canal company actually purchased 2,050 acre feet at a cost of $5.00 per acre foot or a total cost of $10,250.00.

Under date of the 6th of March, 1913, the Central Irrigation District purchased from the government a guarantee flow of 4,050 acre feet of stored water, of which the engineers of the Reclamation Service estimated that 1,595 acre feet would be furnished under their original river appropriation so that the district actually purchased 2,455 acre feet of stored water at a cost of $5.00 per acre foot or a total cost of $12,275.00.

Under date of January 17, 1913, the Gering Irrigation District purchased from the government a guaranteed flow of 35,500 acre feet of which the Reclamation Service engineers estimated that 15,500 acre feet would be furnished under their original appropriation, so that the District actually purchased 20,000 acre feet at a cost of $5.00 per acre foot or $100,000.00.

It will be noticed from the above that from the way of figuring each canal was charged $5.00 for every acre foot of storage water purchased. Other canals have under consideration the advisability of purchasing stored water from the government so as to insure a permanent water right, but for various reasons these contracts have not been entered into and signed up.

Storage water has been rented by the Reclamation Service to various other canals at a cost of thirty cents per acre foot per season.

That section of the law which provides for the cancellation of water rights which have not been used for three consecutive years is so drawn as to make it very expensive and hard to comply with. With the limited appropriation that the department has had during the past biennium it has been impossible to proceed to cancel any of the many water rights which have not been used for the past three years. The department has, however, made field inspections of practically every water right in the state and has a very complete record showing exactly the conditions that have existed during the past few years under each one. It is recommended that either an appropriation large enough to carry out the method of procedure as outlined by the law now be made or else that the law be changed in some way to make a similar method of getting at the same results.

REPORT OF SUPERINTENDENT OF WATER DIVISION NO. 1

Mr. Donald D. Price, State Engineer,
Lincoln, Nebr.

Dear Sir:—I herewith submit my report covering the past two years, omitting the usual discussion on general conditions, giving only such data as may be of interest on the Platte, North Platte and South Platte Rivers and their tributaries.

The flow of the North Platte River in Nebraska is regulated by the United States Reclamation Service at the Pathfinder Reservoir. It is the intention of the United States Reclamation Service to, at all times turn down out of the reservoir as much of the natural flow as may be necessary to supply all water users along the North Platte and Platte Rvers. A discharge of approximately five thousand second feet will at the present time furnish water for all users. However, an inspection of the following table shows the inflow to rapidly diminish during the months of July and August.

	1913	1914
May	5215	7148
June	4281	8408
July	1030	1715
August	394	994

The river falls rapidly beginning about July 1st, and usually on the 10th of July the demand will exceed the supply and at this time it becomes necessary to close the headgates of the irrigation canals having later priorities of right. Closing and opening the canal headgates is the duty of the Water Commissioner of the various districts and for their services they are paid by the county in which they act. The counties are negligent in this matter and it is suggested that some law be passed which will assure the payment of these bills.

The following table gives the areas irrigated and the sources of supply during the seasons of 1913 and 1914:

STREAM	1913	1914	
Platte River	10,107	32,221	acres
North Platte River	265,566	284,440	
South Platte River	2,407	17,638	
Birdwood Creek	125	.....	
White Tail Creek	3,730	6,560	
Lonergan Creek	231	847	
Sand Creek	335	500	
Otter Creek	1,538	1,249	
Blue Creek	7,140	7,802	
Pumpkin Seed Creek	2,349	3,740	
Spotted Tail Creek	280	160	
Total	293808	355,877	

The following table gives the names of the canals having entered into a permanent contract with the government for storage water together with the amount purchased in acre feet:

Canal	Amount
Gering	35,500 acre feet
Tri-State	180,000
Central	4,050
Chimney Rock	10,300
Browns Creek	19,900
Beerline	2,800

The Alliance and Belmont canals rented storage water from the government during the season of 1913 and the Alliance, Winters Creek and Enterprise Canals on the North Platte River and the Meeker, Blue Creek Irrigation District, Iowa Irrigation Company, and the Paisley Ditches on Blue Creek rented storage water during the season of 1914.

The canals having Blue Creek for their source of supply being later priorities are closed down during a water shortage and the Blue Creek Water permitted to flow to the river for the use of earlier priorities. The users on Blue Creek made arrangements with the government for the purchase of a sufficient quantity of storage water from the Pathfinder Reservoir to supplant the flow of Blue Creek and by so doing obtained the use of the Blue Creek water for themselves throughout the entire season of the year 1914. This arrangement will doubtless be duplicated in the future.

Scottsbluff county contains much of the land reported for irrigation. During 1914 this amounted to 80 percent of the total amount of the North Platte and Platte Rivers.

Respectfully,

R. H. WILLIS,

Superintendent Water Division No. 1.

Bridgeport, Nebraska, Sept. 30, 1914.

REPORT OF SUPERINTENDENT OF WATER

DIVISION NO. 2

Mr. Donald D. Price, State Engineer,
Lincoln, Nebraska.

I herewith submit my official report for the biennium ending September 30, 1914.

The situation in this district, in regard to irrigation, is very much the same as it was two years ago when I made my report. I am sorry I cannot report more improvement in the way of building of reservoirs, and the storing of flood waters, as that is the only way that the amount of land irrigated in this part of the state can be increased as the normal flow of the streams in the northwestern part of the state has been appropriated.

During the present season of 1914, the only stream that furnished any water for irrigation the last half of the month of July and all the month of August, was the Niobrara River.

The amount of rainfall this season has been very light. The government gauge established here in Crawford last spring showed the following amounts:

April	4.20	inches
May	1.57	
June	.51	
July	.20	
August	1.09	
September (first half)	.39	
Total	7.96	

Being 7.96 inches of rain since the first of April, over one-half of which fell in the month of April.

Owing to the good management of your commissioners, M. J. Gayhart in the Hat Creek District and J. H. Cook in the Upper Niobrara District, I have had very little trouble from either of these districts. I have not been able to get a commissioner for the White River and lower Niobrara that was satisfactory so that I have had to look after that part of the district myself.

I think there should be an amendment to the law in regard to the measurement of water, especially in this district, where the ditches are small. I think the commissioner should be allowed to distribute the water to each ditch according to their priority giving each ditch all the water it has capacity to carry until they have received the amount of water they are entitled to. And this should not exceed one acre foot for each acre irrigated plus the seepage. Or in other words I think that one acre

IRRIGATED OATS IN WESTERN NEBRASKA

foot of water to each acre irrigated is sufficient. Though I think that the best results would be obtained by applying one-half of it early in the season and the other half near the close of the irrigating season.

Yours respectfully,

PAGE T. FRANCIS,

Superintendent Water Division No. 2.

Crawford, Nebraska, September 30, 1914.

DRAINAGE

The Legislature of 1913 passed the following law relative to drainage: "All plans for proposed drainage districts shall be approved by the state board before any contract is let or begun. The state board through its representatives shall have authority to order any change they may see fit in said plans and require the drainage district to conform thereto, and shall at all times, during the construction, have the right to inspect said work and make recommendations pertaining to the same. Upon request of any interested party of parties of a proposed drainage district, the state board may prepare for them plans and specifications for any proposed drainage work at actual cost of doing the same."

This law has only been in effect during the past two years but it is believed that it is a good one as it assures the proposed drainage district of any recommendations or changes that a disinterested party acquainted with this work would have after a careful consideration of the plans and an inspection of the actual conditions in the field. It also insures proper plans for the building of the proposed drainage work to the district itself and the proper laying out of the work.

Several large drainage districts have been formed during the past biennium and plans for the same have been presented to and approved by this office. One of the largest of these is the Otoe and Johnson Counties Drainage District Number One, whose plans have been approved just recently and the contract for this work is expected to be let some time this winter.

Also under this law the state board is given authority to make surveys for interested parties. As yet no work of this kind has been done by the department for the reason that no requests have come in. It is expected that after the people of the state become familiar with this law and the workings of it that surveys of proposed drainage works will be made by this office and arrangements should be made for the proper carrying out of this work. The people of the state have not taken as much advantage of this portion of the law as they might.

The benefits which have been derived from drainage works constructed in the southeastern portion of the state have been very great. That section of the state has many streams such as the Nemahas and others that drain a large area of rolling land and these streams are very crooked, with timber and shrubs growing along the banks making it difficult for the flood water to get away quickly. By the building of proper drainage ditches, straightening out the channels, a good grade is secured with clean, straight banks which allows the water to run off

rapidly and keeps the bottom land along these streams from overflowing. Experience has taught that by the building of these ditches, the increase in crops on these bottom lands have been such that the improvements have been paid for in about two years' time. Also by draining this land the value of it increases very materially, more than paying for the cost of the drainage works constructed.

There is also a large field for drainage work to be carried on in the irrigated section of our state where large areas have been brought under irrigation and the return flow to the stream is seeping up the lower lands. A number of drainage ditches have been constructed in Scotts Bluff county draining land which would have otherwise become seeped.

IRRIGATION IN NEBRASKA

Prepared by Irrigation Investigations, Office of Experiment Stations, U. S. Department of Agriculture, under a co-operative agreement with the State Engineer of Nebraska.

ACKNOWLEDGMENTS

In 1908 O. V. P. Stout, irrigation engineer in the office of Experiment Stations, prepared a report on irrigation in Nebraska. The same year Adna Dobson, then state engineer of Nebraska, was commissioned by the Office of Experiment Stations to prepare a report on irrigation laws of Nebraska. F. W. Stanley, irrigation engineer, who was in charge of the work for the Office of Experiment Stations in Nebraska in 1911, and H. C. Diesem, irrigation engineer, who has been in charge of the work since 1912, revised the reports prepared by Messrs. Stout and Dobson, and brought the data down to include the year 1912. The present report was prepared by Mr. Diesem under a co-operative agreement between the State Engineer of Nebraska and the director of the Office of Experiment Stations and is based upon the former reports and upon data collected during 1914 by the State Engineer and Mr. Diesem.

INTRODUCTION

The state of Nebraska lies between 40° and 43° latitude north and the 95° 25′ and 104° longitude west being a part of the territory purchased from France in 1803 at an average cost of 2 3-5 cents per acre. The state is approximately 200 miles wide and the extreme length is about 460 miles. It has an area of 77,520 square miles, being nearly twice as large as Ohio and larger than the New England states combined. The state lies just north of the geographical center of the United States and, according to the census of 1910,* contained over 5 per cent of the improved lands in the United States.

TOPOGRAPHY

The state lies wholly within the region formerly known as the Great American Desert, but now called the Great Plains. The general slope of the land is from west to east, and is approximately seven feet to the mile. There is also a secondary slope from north to south in the eastern portion of the state. The altitude of the state varies from less than 830 feet in the extreme southeastern part to an average of nearly 5,000 feet along the Nebraska-Wyoming state line.

The state may be divided into three regions—the Loess, the Sand Hill and the High Plains.†

*Thirteenth Census, U. S., 5 (1910), pp. 67-70.

†The following descriptions of these regions have been compiled from papers of George E. Condra, professor of geography and economic geology in the University of Nebraska.

Loess Region

This region, so named because of the prevalent surface deposits, includes the eastern third of the state, and in the southern part extends westward along nearly the entire length of the state. It comprises about one-half the area of the state. The region is composed of smooth loess plains, broad alluvial plains, hill lands and small areas modified by bluffs and canyons. The subsoil is deep.

In the eastern part of the region the subsoil is of a glacial formation and consists of three fairly distinct drift sheets, namely: a bluish clay overlaid by sand and gravel, which in turn is overlaid by clay, changing from yellow to a brown color near the surface. Boulders are to be found in each drift sheet, but in relatively small numbers. The drift forms the core of most of the hill land of eastern Nebraska. Corn is the chief crop upon these lands, but the roughest of them are devoted to grazing and growing trees.

At various places in the Loess region, as south of the Platte river, the land is a smooth plain, the loess deposit having capped a portion of the glacial area. The deposits are deep and the soil is fertile and easily tilled except where the land is rough. Such land is more valuable than that of the glacial regions as it contains enough lime to make it sweet, and for this and other reasons, is well suited to alfalfa. Alfalfa, wheat corn, oats, and other cereals are grown throughout the Loess region, but in the middle part the leading crop is wheat. This is due to the fact that the smooth topography makes harvesting easy, and the precipitation —10 to 25 inches anually—is sufficient for wheat but is a little light for corn. There is comparatively little farming in the western part of the Loess region except in the valleys, and grazing is the chief industry.

The broad alluvial plains of the Platte valley are a feature of this region. This valley was formerly at a much lower level than at present, but the river has filled it in with sediment to the elevation of the present benches and then eroded a channel, leaving the benches on the sides of the valley. The upbuilding made the river unfit for navigation.

The Loess region is the richest agricultural district in the state. It is the most thickly settled and best improved section of the state, and is well supplied with good wagon roads, towns and railroads.

Sand Hill Region

The Sand Hill region is located between 98° and 103° latitude between the Niobrara river on the north and the North Platte and Platte rivers on the south. In addition, there are some scattered, detached areas lying south of the South Platte river. This region comprises an area of approximately 20,000 square miles. The soil is chiefly dune sand. Throughout the region dunes, ridges, basins and valleys are the prevailing land formations. The rivers are few, but there are several groups of small lakes. Drainage is principally underground, the water coming to the streams through springs. The soil is poor except on

the firmer lands in the larger valleys where good wild grass lands are found. This region supports a thin growth of hard-stem grasses and low shrubs, which form a basis of the leading industry—cattle raising. What little agricultural land there is usually is to be reached only by heavy roads leading across the dune sand. The region is very sparsely settled. The lack of development in this section is due to the quality of the soil rather than to the lack of precipitation.

High Plains Region

The western portion of the state formerly was smooth table land or high plains but the continual eroding action of the streams has cut deep valleys across the plain, producing small provinces each having distinct features to topography, drainage, water supply, vegetation and industries. These provinces are the Pierre and White River plains, Pine Ridge, the Box Butte plains, the Platte valley, the Wild Cat range, and the Cheyenne plains. Pine Ridge lies between the White River and Hat Creek drainage basins on the north and the Niobrara river on the south. It is about 100 miles in length, has an area of approximately 5,000 square miles, and rises to an elevation of 5,100 feet. Wild Cat range is located between the North Platte and Pumpkinseed valleys and extends eastward from the Wyoming line about 40 miles. The highest point of this range is Hogback mountain, which rises to an elevation of 5,082 feet. Cheyenne plains is located south of the Pumpkinseed valley and extends south to the state line. This plain has been modified by the eroding of a shallow valley by Lodge Pole creek. The highest point in the state is northwest of Kimball in this plain, and rises to an elevation of over 5,340 feet.

Most of the High Plains region is capped by tertiary deposits—clay below the sandy to pebbly above. The original surface is in the process of destruction by rivers and wind. The North Platte river has eroded a valley several miles wide to a depth of 600 to 800 feet below the bordering plains, but at the present time is apparently refilling its bed. Between the tables and the bottom lands are benches and steep valley slopes, the latter in the process of dissection. The smooth uplands are covered with buffalo grass and other gramma grasses and are known as the short-grass country.

The water supply, although at considerable depth below the surface is of good quality. The soils vary from fine to coarse in texture and produce grazing, but as a rule are not sufficiently drouth-resistant for farming. Small areas, where the soil is of close texture and deep, grow good crops, thus showing that the type of soil is of as much importance as the amount of rainfall.

Most of the steep valley sides are bare, but in some places they support thin stands of pines and cedars. The more gradual slopes grow bunch grass, prairie grass, blue stem and sagebrush and are given over almost exclusively to grazing. The alluvial and other smooth lands along the valleys grow native hay. Much of the bottom and bench

lands, especially along the North Platte river, are farmed under irrigation. These irrigated sections, with their settlements and towns, are a distinct contrast to the retarded development of other sections of this region.

CLIMATE

The earliest climatological records of the state were those kept at the various army posts, the earliest being those at Fort Kearney, which were begun in 1849. Records were kept by settlers at Omaha in 1857, at Bellevue in 1858, and at Nebraska City in 1859. It was not until 1878, however, that an organized attempt was made to study the climate of the state, at which time Professor Gilbert E. Bailey, of the State University, organized the observers into what he called a volunteer weather service "for the purpose of collecting facts and securing an accurate and complete history of the weather of Nebraska." The organization thus formed has existed much the same to the present time, and for more than thirty years a monthly report of the weather has been issued without a single omission. Sufficient data has been collected to show the error in the belief of the early settlers that the climate was rapidly changing. Observations extending over half a century show no evidence of a change in climate. The variations observed in the half century would have occurred the same in all probability had the land been uninhabited, and are similar to those occurring elsewhere. The climate of the state is determined by its position on the continent, independent of anything within its borders except altitude.*

TEMPERATURE

The highest mean annual temperature—52°—occurs in the southeastern portion of the state. There is a decrease westward to 50° in Dundy county at an elevation of 3,250 feet; that for the most southern tier of counties being about 51°. There also is a decrease to the north at the rate of about 1 degree for each 38 miles, so that the mean annual temperature along most of the northern boundary is about 46°. It falls below 45° in the extreme northwest. The lower temperatures in the western and northern parts of the state are due in part to the higher elevations. January is the coldest month, with a mean temperature of 25° in the southeast, and 20° or a little less in the northwestern part. February is almost as cold, averaging about 3 degrees warmer, while December is next, with an average of about 2 degrees higher than February. While the coldest weather of the year may occur in any one of these months, it is most likely to occur during the last half of January. Temperatures of 10° and 20° below zero, and on rare occasions 30° below, occur on the coldest days. In the elevated portion of the northwestern part of the state as low as 47° below zero has been recorded. The temperature rises during March, April, May and

*Newspaper articles and data from G. A. Loveland, director of Nebraska section, U. S. Weather Bureau.

June at the rate of about 10 degrees each month. July is the warmest month, with a range in mean temperature from 78° in the southeast to 72° in the northwest. The hottest days in summer most frequently occur during the last half of July, but the hottest period of the year sometimes comes in August and September. The temperature commonly reaches 100° on the hottest day of the season, while in the extreme heat of 1913, temperatures of 106° to 112° were recorded in several places. The high temperatures seldom last more than a few hours in the middle of the day. Usually there is a wind blowing and the air is quite dry, making the high temperature less oppressive than the figures would seem to indicate. In the evening there is always a drop in temperature, so that even in the hottest weather the nights usually are comfortably cool.

The last killing frost in the spring generally occurs in the southeastern part of the state during the last ten days of April. In the greater part of the agricultural section of the state the last killing frost occurs about May 1, while in the northwest, the more elevated section, the season is about two weeks later. The first killing frost in the fall occurs in the northwestern portion of the state generally during the last week of September and five to ten days later in the South Platte valley district. The average number of days without killing frost during the growing season is 155 to 165 in the southeastern portion of the state; 145 to 155 in the northeastern, central and southwestern portions; and 130 to 135 in the northwestern portion.

RAINFALL*

Probably to the average person more interest centers around the question of rainfall than all other climatic factors combined. A larger proportion of each inch of rainfall is absorbed by a cultivated soil than by prairie sod. This fact accounts for the tales of early settlers who relate how the draws ran bank full after each heavy shower. Thus, the same rainfall furnishes more moisture available for vegetation now than before cultivation. This has induced a firm belief in the minds of many that somehow in spite of the rain gauges and statistics, the rainfall is increasing. The precipitation of Nebraska is chiefly in the form of rain. The snowfall for a year averages about 25 inches, equal to about 2½ inches of water, or about one-tenth of the annual precipitation. The moisture precipitated over Nebraska comes largely from the Gulf of Mexico and is brought by the prevailing southerly and southeasterly winds of spring and summer. The total annual precipitation slightly exceeds 32 inches in the southeastern part of the state. It decreases northward to 28 inches in Dixon county near the northeast corner, and westward at a rate of approximately 1 inch for each 25 miles to about the 100th meridian; thence westward the decrease is

*Notes and data by G. A. Loveland, director of Nebraska section, and H. P. Harden, local observer, North Platte, U. S. Weather Bureau.

VIEW OF LITTLE NEMAHA RIVER, SOUTHEASTERN NEBRASKA, SHOWING DIFFICULTY THAT FLOOD WATER WOULD HAVE IN GETTING AWAY

about one inch for each 30 miles, so that in Kimball, Banner and Scotts Bluff counties the rainfall is but little more than 15 inches. It is a trifle more in the extreme northwest, where it seems to be influenced by the Black Hills.

Very little rain or snow falls during the winter months, the average being less than 1 inch of water per month from November to February inclusive. A slight increase is manifested in March, but the spring rains begin in April when 2 to 2½ inches is the normal for the western portion of the state. May, June and July are the months of greatest rainfall. The normal rainfall for the entire state in May is 3.69 inches; June, 3.89 inches, and July, 3.59 inches, making the total for the three months 11.17 inches, or 46 per cent of the annual precipitation. Expressed in a more detailed form, the normal rainfall for the southeastern portion of the state in May is 4.85 inches; June, 4.61 inches, and July, 5.25 inches, a total of 14.71 inches, or 43 per cent of the annual precipitation for that section. In the northeastern portion the normal rainfall in May is 4.24 inches; June, 4.42 inches, and July, 3.35 inches, a total of 12.01 inches, or 42 per cent of the annual precipitation in that section. The normal rainfall in Dundy county in May is 2.40 inches; June, 2.97 inches, and July, 2.93 inches, or a total of 8.30 inches, which is 50 per cent of the annual precipitation. In the northwestern portion of the state the normal for the year increases slightly, but the normals for June, July and August show a slight decrease, being 2.69 inches in May; 2.91 inches in June, and 2.04 inches in July, a total of 7.61 inches, which is 46 per cent of the annual precipitation.

June is the month of heaviest rainfall, and in the average month rain falls at any one place on 8 or 9 of the 30 days. In the past 40 years of observations at North Platte 21 Junes have had periods of five or more days without rain; ten had periods of ten or more consecutive days without .01 inch or more of rain; ten had periods of fifteen or more consecutive days without sufficient moisture to benefit vegetation, and on three occasions drouthic conditions extended throughout the entire month.

While the average monthly rainfall for May and July is nearly the same as for June, there is a greater liability to variation from the normal. In May this variation is less likely to be important as the temperature is lower than in July, and also the rainfall is less likely to occur in heavy thunderstorms with the accompanying large percentage of run-off. Rain falls in May on the average on about the same number of days as in June, yet drouth periods are more likely to appear in May than in June. In the observations for forty years at North Platte, 27 Mays have had periods of five or more consecutive days without rain; 11 have had periods of ten or more consecutive days without .01 inch of rain; 15 have had periods of fifteen or more consecutive days without sufficient rainfall to benefit vegetation; and drouthic conditions existed throughout the entire month on seven occasions.

In July the showers are slightly farther apart than in June, but with a greater rainfall in each shower. In the average July, rain falls at any one place on seven or eight of the thirty-one days. In 40 years at North Platte, 26 Julys have had periods of five or more consecutive days without rain; 11 have had periods of ten or more consecutive days without .01 inch or more of rain; 9 have had periods of fifteen or more consecutive days without sufficient rainfall to benefit vegetation; and drouthic conditions have extended throughout the entire month on five occasions.

The decrease in rainfall after July is rapid in the western portion of the state. The normal rainfall for August is only about three-fourths that of July, and the September normal is only about 65 per cent of that of August. Not only are the showers in August farther apart than in June and July but the amount of rainfall in the average shower is less. Heavy rains are less likely to occur in August than in June or July and drouth periods are more common.

During the summer months a very large proportion of the rainfall in Nebraska occurs in thunder showers. A shower usually lasts but a short time but frequently there is a heavy rainfall. A slight or moderately heavy all-day rain rarely occurs. During September, light rains lasting 12 to 24 hours, accompanied by little or no lightning, become more common. Rain falls on the average four or five days during the month. In fact, two-thirds of the September rainfall usually occurs in one wet period, lasting from two to four days. In October the dry season is rapidly approaching. Rain falls at any one place on an average of four of the thirty-one days. Drouth periods are frequent and including parts of the adjoining months periods of 20 to 60 days have occurred without sufficient rainfall to benefit vegetation.

HUMIDITY*

The average relative humidity for the state is near 70 per cent. In the western portion of the state it frequently falls below 10 per cent during the afternoon of the spring and summer months.

WINDS*

The prevailing direction of the wind is from the northwest unless influenced by local conditions. The wind blows from the south and southwest the greater portion of the time during the warm months of June, July and August, and with more or less frequency during the rest of the year, but from the middle of September to the middle of May the preponderance of wind is from the northwest. The normal mean velocity of the wind for the state is 10 miles per hour. Storm ve-

*U. S. Dept. Agr., Weather Bur. Summary of the Climatological Data for United States by Districts, sects. 35, 36, and 37.

locities of 30 to 50 miles are frequently recorded. Velocities of 70 to 80 miles per hour have occurred at rare intervals, but for short periods of time, and in the eastern portion of the state usually are accompanied by severe thunder storms.

WATER RESOURCES

The rainfall in the eastern half of the state is usually sufficient to produce crops and irrigation is not practiced, but in the western third or possibly half of the state, farming without irrigation is a hazardous undertaking. Generally the direct flow, during the spring and early summer months, of the streams located in the western part of the state greatly exceeds the demand for irrigation, but in the latter summer months it rapidly diminishes and is inadequate for the acreage now under irrigation canals. These streams are subject to periodic floods during the early spring months, due to the melting snows and heavy spring rains and, if these floods could be stored in reservoirs, lands that are now lying practically idle could be reclaimed and made productive.

The general course of all the drainage within the borders of the state is in an easterly direction. The physical features of the state are such that the streams have eroded valleys into the high plains that formerly traversed the western portion of the state, leaving high divides between the adjacent drainage basins. The three principal drainage basins are those of the Niobrara, the Platte and the Republican rivers, located in the northern, central and southern portions of the state respectively. The largest of these is the Platte river and its branches, the chief of which are the North Platte, the South Platte, Loup and Elkkhorn rivers. There are few minor areas drained by the following streams: Hat creek, in the extreme northwest corner of the state; White river, draining an area lying between Hat creek and the Niobrara river; and the Big Blue, Little Blue and Nemaha rivers, drainings areas in the southeastern portion of the state. There also are many small creeks in the eastern and northeastern parts of the state that flow directly into the Missouri river.

STREAM MEASUREMENTS. Gauging stations have been maintained upon many of the streams by the office of the state engineer which, to a great extent, has worked in conjunction with the U. S. Geological Survey.* With very few exceptions these gauging stations have not been operated during the winter months and the records do not show the entire flow of the stream. Approximately 2,000,000 acre-feet of water flows from the semi-arid portions of the state each year as follows:

*Reports of state engineer, and U. S. Geol. Survey Water-Supply Papers 27, 37, 49, 66, 75, 84, 99, 130, 131, 172, 208, 246, 266, 286, and 306.

	Acre-feet
Hat Creek	50,000
White River	100,000
Niobrara River	500,000
Platte River, less 1,070,000 acre-feet stored in Pathfinder dam	930,000
Republican River	400,000
	1,980,000

Since the state laws allow 3 acre-feet per acre, over 600,000 acres could be irrigated with the above water supply, provided it could be stored and put upon the lands.

NORTH PLATTE RIVER. Numerous small streams having their sources in the high mountain ranges that surround North Park, located in the north-central portion of Colorado, and flowing toward the center of the park, which lies 4,000 to 5,000 feet below the bordering ranges, form the headwaters of the North Platte river. The river flows northward into Wyoming, but near Casper on the north side of the Casper range, turns to the east and southeast, crossing the Nebraska-Wyoming state line 70 miles south of the northwest corner of Nebraska, and maintains a southeasterly direction to its junction with the South Platte river a few miles east of the town of North Platte. The river crosses the Colorado-Wyoming line at an elevation of about 8,000 feet, the Wyoming-Nebraska line at an elevation of 4,040 feet, and at its junction with the South Platte river is 2,760 feet above sea level. It has a length of about 650 miles and a total drainage area of 28,800 square miles, of which 1,800 square miles are in Colorado, 20,000 square miles in Wyoming, and nearly 7,000 square miles in Nebraska. The principal tributaries in Wyoming are the Medicine Bow, Sweetwater and Laramie rivers, which, together with the smaller tributaries, drain practically all of the southeast quarter of that state.

From just north of Guernsey, Wyo., the river flows through a valley which has been eroded out of the high plain. This valley gradually widens toward the east, attaining a width of 10 to 15 miles in Nebraska. The stream bed is broad and shallow, and lies about 700 feet below the bordering divides. The stream is bordered by benches or tables which usually rise abruptly from one to the other. The higher benches are marked by cliffs and buttes of various forms and heights. Numerous small tributaries have cut similar valleys from the divides through the benches to the river bed. The principal tributaries within Nebraska are the Pumpkinseed, White Trail, Blue and Birdwood creeks. The soil of the valley is an alluvial deposit with some outcroppings of Brule clay, and is usually termed a sandy loam.

The precipitation along the river ranges from 20 inches and over in the high mountains, to about 11 inches in the lower mountains, and from

15 inches at the Nebraska-Wyoming line to nearly 19 inches at North Platte. The melting snows in the mountains cause periodic floods, which reach their maximum stage during the latter part of May, or in June. At such times the discharge of the river often exceeds 20,000 second-feet and has reached a maximum of 29,600 second-feet. The flow diminishes rapidly during the latter portion of the summer months and the discharge is less than 100 second-feet during the months of August and September.

Irrigation is practiced quite extensively along the North Platte river. During the spring and early summer months the water supply is adequate, but during the later growing months the demands for irrigation far exceed the natural flow of the river. There are excellent reservoir sites to be found along the upper course of the river and the U. S. Reclamation Service has developed the most notable one, the Pathfinder reservoir, by building a dam 218 feet high which stores 1,070,000 acre-feet of water for use upon the North Platte project.

The office of state engineer has maintained numerous gauging stations along the river, the records of which are to be found in the hydrographic report of the state engineer for 1914.

PUMPKINSEED CREEK. This tributary of the North Platte drains a valley between the Wild Cat range and the Cheyenne plains. The valley is 50 miles long, about 12 miles wide at the upper end, and gradually narrows to a width of about 4 miles. The bed of the creek lies 200 to 400 feet below the crest of the Wild Cat range and 300 to 500 feet below the crest of the divide on the south.

The creek rises in the northwestern portion of Banner county from springs and seeps on the south face of the Wild Cat range and flows eastwardly along the base of the range for a distance of 40 miles, where it turns abruptly to the north for a few miles and empties into the North Platte river several miles east of the town of Bridgeport.

There are many small tributaries from the south, but these supply water only during the rainy portions of the spring months. During the low stages of the flow the water sinks into the sand and gravel of the stream beds. The principal tributaries are the Lawrence Fork and Greenwood creeks. The tributaries from the north are all short, and although some small springs are to be found at the heads of the canyons, no water flows down the canyon except during flood periods.

The creek and its tributaries are subject to early spring floods, due to the melting snows, and dams built for diverting water for irrigation are often washed out. The annual rainfall within this drainage area ranges between 15 and 16 inches.

Considerable irrigation is practiced along the course of the stream and during the growing season there is a scarcity of water. A few guagings have been made on the creek. The highest discharge, 30 second-feet, was recorded during the month of June, 1907. The early

spring floods exceed this discharge but no guagings have been made at flood stage. With the few gaugings on record it would be useless to attempt to estimate either the discharge of the stream or the run-off from the valley. If the spring floods could be stored, quite an additional area could be brought under irrigation.

BLUE CREEK. There are many who advocate the theory that the true scource of Blue creek is Snake creek, which rises in the sand hills in the southeastern portion of Sioux county and flows in a southeasterly direction through a shallow valley on the table land north of the North Platte river and which, upon entering the sand-hill region, in the southeastern portion of Box Butte county, disappears. They base their belief upon the fact that successive valleys and lakes are encountered between the place where Snake creek disappears and Beaver lake which is the source of Blue creek. From Beaver lake the creek flows in a southeasterly direction for a distance of about 35 miles and empties into the North Platte river west of the town of Lewellen.

The annual rainfall in this section is about 17 inches. The rainfall from the precipitation that falls in the sand-hill region, which acts as a storage reservoir, reappears in the form of springs. The creek is spring-fed and has a very steady flow throughout the entire year. Guagings made from time to time show the average flow to be approximately 90 second-feet. The highest discharge recorded was measured in March, 1897, when the flow was 115 second-feet. Considerable irrigation is practiced in the lower end of the valley and some water is diverted and used on the land lying contiguous to the North Platte River.

There are several reservoir sites on this creek which can be developed at a reasonable cost. The construction of one or more of these would insure water for irrigation purposes during the latter part of the season when all of the direct flow of the creek is needed to supply canals along the North Platte river having earlier priorities and would make possible the bringing of a larger area under irrigation.

WHITE TAIL CREEK. White Tail Creek has its source in the northern part of Keith county from springs in the sand-hill region north of the North Platte river and flows in a southeasterly direction for 10 or 12 miles, and empties into the North Platte river a short distance west of Keystone. The annual rainfall in this vicinity is about 18 inches.

The flow of the creek is supplied from springs and is quite uniform throughout the year. Some gaugings of this creek have been made. The highest discharge measured was during the month of May, 1902, when the flow was 36 second-feet. Measurements during the months of August and September, 1910, showed a flow of 23 second-feet. The flow is diverted and used in irrigating lands that lie contiguous to the North Platte river.

BIRDWOOD CREEK. Birdwood creek rises in the southern portion of McPherson county, from springs located in the sand-hill region, flows

in a southerly direction for about 28 or 30 miles, and unites with the North Platte river northwest of Hershey. The annual rainfall in this section is a little over 18 inches.

The creek is fed by springs and is noted for its constant flow. It is the most important tributary of the North Platte river in Nebraska. Some guagings have been made at various times. The highest discharge, 183 second-feet, was recorded in August, 1901, and the lowest discharge, 123 second-feet, recorded in May, 1898. The office of the state engineer has maintained a guaging station upon the creek during the past year. The flow of the stream is diverted and used in irrigating the bench lands bordering the North Platte river.

SOUTH PLATTE RIVER. The headwaters of the South Platte river drain the high mountain peaks surrounding South Park, a basin near the center of the State of Colorado, and the eastern slope of the mountains forming the Continental Divide. These mountains vary in altitude from 9,000 to 14,000 feet.

The general course of the stream is eastward to Lake George, thence northward through a deep canyon in the Frontal range known as Platte canyon, for a distance of 30 or 40 miles. It enters the plains about 20 miles southwest of Denver, flows northward through Denver, to its junction with the Cache la Poudre river near Greeley, and thence eastward across the Colorado-Nebraska state line at a point 8 miles west of the northeast corner of Colorado and on until it unites with the North Platte river east of the town of North Platte.

The tributaries of the South Platte river may be divided into two classes: Those having their sources in the mountains where the drainage area is rough and precipitous and covered with forests; and those having their sources in and draining the Great Plains east of the mountains. The latter are more or less intermittent in their flow.

The precipitation along the course is 25 inches, falling mostly in the form of snow, along the Continental Divide; 14 inches at Denver where the river emerges upon the plains; 16 inches at Julesburg, Colo., just before the river enters Nebraska; and 19 inches at North Platte, Nebr., where the river joins the North Platte river.

The flow of the tributaries rising in the mountains is perennial, but because of diversions little, if any, water reaches the South Platte river except in times of flood. The tributaries having their sources in the plains furnish water only during times of heavy precipitation. This results in floods during the months of May and June, the volume of which depends upon the seasons.

The drainage area above Julesburg, Colo., is 20,600 square miles. The flow at that point varies from nothing up to 12,000 second-feet.

The South Platte valley within Nebraska is about 80 miles long and averages several miles in width. The river bed lies over 100 feet below the bordering uplands. The river skirts the base of the hills on the

north, which rise much more abruptly than those on the south. The bed is wide and sandy and contains numerous islands, forming many channels all of which flow during flood stages. During the low stages the water flows in a few channels, changing channels from time to time on account of the shifting sand.

At one time considerable irrigation was practiced in Nebraska along this valley, but the area has diminished considerably due to the shortage of water. The State of Colorado refuses to recognize the priorities in Nebraska and subsequent water rights in Colorado now divert practically all of the flow of this river. With the exception of flood periods the river bed at North Platte is practically dry for the entire year.

The U. S. Geological Survey maintained a guaging station at Orchard, Colo., from 1898 to 1900. In 1901 this station was discontinued and a new station located at Kersey Colo. There is only one break in the records, during the year 1904, when the Kersey station was not maintained. The station was established at Julesburg, Colo., in 1902. The records for the flow of the river for these stations can be found in U. S. Geological Survey Papers.*

LODGE POLE CREEK. This creek has its source in the Laramie mountains in Wyoming, approximately 75 miles west of the Nebraska-Wyoming state line, and flows in an easterly direction entering Nebraska 13 miles north of the Colorado line. The stream winds its way through Nebraska for a distance of 90 miles and then enters Colorado 19 miles west of the northeast corner of that state, and unites with the South Platte river 6 miles south of the state line.

Within the state of Nebraska the creek is located on the divide between the North Platte and the South Platte rivers and is a narrow, winding stream, not over 20 feet wide at its widest point, that has cut its way into the high plains to a depth of approximately 300 feet. The valley is 1 to 3 miles wide and contains two benches. The lower bench produces wild grass. The upper bench, containing the greater area, has a gradual rise back from the creek and then an abrupt rise to the table lands.

The creek disappears and then reappears three times along its course. Eighteen miles west of the Nebraska-Wyoming line the flow disappears in the sand and the bed remains dry for a distance of 15 miles. About 30 miles east of the state line it disappears a second time and the bed remains dry for a distance of 10 miles, and about 24 miles farther east it disappears again for a distance of 5 miles. At the points where the flow disappears, the creek bed widens out, is very sandy and gravelly, and is covered with vegetation. Only during flood times is water known to flow through these dry sections of the stream.

*U. S. Geol. Survey Papers 27, 37, 49, 75, 84, 99, 131, 172, 208, 246, 266, 286, and 306.

VIEW OF COMPLETED DRAINAGE DITCH IN SOUTHEASTERN NEBRASKA, SHOWING STRAIGHT DEEP CHANNEL AND FREE GETAWAY FOR FLOOD WATERS

Lodge Pole creek drains a long, narrow valley having a total drainage area of 2,200 square miles, of which 850 square miles are in Wyoming, and 1,350 square miles in Nebraska. The water supply is derived almost entirely from springs, as the only tributaries, with the exception of a few spring-fed ones less than one mile in length, are dry draws.

The creek enters the state at an elevation of 5,000 feet and crosses the Nebraska-Colorado line at an elevation of 3,500 feet, and has an average fall of 17 feet per mile in Nebraska. Numerous gaugings have been made from time to time. These show the discharge to range between 1 and 48 second-feet. During short flood stages, however, the flow greatly exceeds these amounts. The creek is noted for its early spring floods due to melting snows and heavy spring rains.

Irrigation is practised extensively along the valley, and taking into consideration the size of the creek, more is accomplished in this valley than from any other stream in the state.

PLATTE RIVER. The Platte river is formed a few miles east of the town of North Platte by the junction of the North Platte and the South Platte rivers and winds eastward across the state for a distance of 250 miles, uniting with the Missouri river about 15 miles south of Omaha.

The stream bed, which lies 50 to 400 feet below the crest of the bordering bluffs, is broad, shallow and contains numerous channels that have been cut between permanent islands. The river flows through a broad, level valley, which is 15 to 20 miles in width, except east of Ashland where it is confined between limestone bluffs. The river practically has no drainage from the south, but a large area in the north-central and the northeastern portions of the state are drained by its two principal tributaries, the Loup and Elkhorn rivers.

The precipitation along the course ranges from 19 inches at North Platte, to about 30 inches at Ashland, the average precipitation for the entire valley being about 23 inches, of which over 15 inches fall during the growing season and about one-half of the remainder is in the form of snow. The river is subject to periodic floods, caused by melting snows on the headwaters of the North Platte and South Platte rivers. These floods reach their maximum in June and July, when a discharge of over 34,000 second-feet has been recorded. During the early nineties considerable irrigation was undertaken along the entire valley. Since that time the irrigated acreage has diminished until at the present time it is only a fractional part of what it formerly was. There is no irriagtion undertaken east of the vicinity of Kearney.

REPUBLICAN RIVER. The Republican river is formed about 6 miles east of the Colorado-Nebraska line by the junction of the North Fork and the Arickaree or Middle Fork. The North Fork has its source in springs in the sand-hill region, about 24 miles west of the state line, and flows in an easterly direction, entering the state about 4½ miles north of the southwest corner. The Arickaree has its source in the arid

plains of eastern Colorado, about equi-distant from Denver and Colorado Springs, about 90 miles west of the east line of Colorado, flows in a northeasterly direction, and drains a very narrow territory. Crossing the northwestern corner of Kansas, it enters Nebraska 3 miles east of the southwest corner, and in conjunction with the North Fork, just below the town of Haigler, forms the Republican river. These tributaries enter the state at an elevation of approximately 3,300 feet. The river itself flows in an easterly direction almost parallel with and never more than 21 miles distant from the south line of the state for a distance of about 240 miles, then turn to the southeast in the vicinity of Superior and crosses into Kansas at an elevation of approximately 1,500 feet. The average fall across the state is 7½ feet per mile.

The river, which is wide and shallow, is principally confined by low, sandy banks, which, in the western portion of the state, are devoid of timber. The stream bed lies from 200 to 400 feet below the bordering uplands and is largely composed by shifting sand. The valley bordering the stream is approximately 3 miles in width, and the soil is a heavy alluvial deposit. The rise from the valley to the uplands is rather abrupt.

The river is fed by numerous springs and spring-fed tributaries along its course. Practically all of the larger tributaires flow from the south, as it is not far to the Platte and the South Platte rivers on the north. The principal tributaries are the South Fork, Frenchman river and Medicine, Sappa and Prairie Dog creeks.

The South Fork rises in the same vicinity and flows parallel to and not far from the Middle Fork. It drains a large area in both Colorado and Kansas, enters Nebraska 26 miles east of the southwest corner, and flows into the Republican river just east of the town of Benkelman.

The annual rainfall along the course of the Republican river ranges from about 17 inches at the western line of the state, to 28 inches where the river crosses the state line into Kansas.

Irrigation is practised in the western portion of the valley. During the early growing season the flow is adequate to supply the demand for irrigation, but during the hotter growing months of the summer the flow diminishes to such an extent that there is always a shortage of water. If the normal flow during the winter months and the spring floods could be stored in suitable reservoirs, irrigation could no doubt be more generally practiced in the western portion of the state and there would be a possibility of bringing more acres under cultivation.

During the years 1903 to 1906, inclusive, guaging stations were maintained upon the Republican river and the South Fork at Benkelman. The drainage areas above this point are 3,965 square miles for the Republican river, and 5,910 square miles for the South Fork, making a total of 9,875 square miles. The records of the above stations are to be found in the hydrographic report of the state engineer for 1914. These records show that the flow of the South Fork ranges between 0 and 397 second-feet as a maximum, with a possible normal flow of 55 second-

feet; that the flow of the Republican river ranges between 0 and 398 second-feet as a maximum with a possible normal flow of 65 second-feet and that during the summer months the flow of the river becomes very low, and that at times the bed was dry. Residents along the stream claim that it is nothing unusual to see the river bed above the mouth of the Frenchman river dry during the summer months.

FRENCHMAN RIVER. This stream has its source upon the plains east of Sterling, Colo., but springs in the vicinity of Holyoke, Colo., furnish the first running water. The river flows in a southeasterly direction crossing the Colorado-Nebraska line about 38 miles north of the southwest corner of Nebraska, and empties into the Republican river east of the town of Culbertson.

The valley through which the stream flows varies in width in different portions of the course. Just northwest of the town of Palisade it begins to widen perceptibly and averages several miles in width for the balance of the distance to the junction with the Republican river valley.

The river is a narrow, winding stream, but as the valley widens out in the lower course, the bed becomes wide, shallow and sandy. The river lies about 100 feet below the bordering uplands.

Frenchman river, being fed by springs, has a very steady flow and this is increased to some extent by the continuous flow from Stinking Water creek, which flows from the north and is the principal tributary.

The annual rainfall in this valley ranges from 17 inches at the Colorado-Nebraska line, to about 20 inches at the mouth of the river. This valley is subject to heavy rains, of short duration, the intensity of which almost border upon that of cloudbursts.

Along the upper courses some irrigation is practiced, but the highest irrigation development is to be found in the portion of the valley lying between Palisade and the mouth of the river. Many gaugings have been made along the river and the least discharge of record at Palisade is 50 second-feet in June 1895, while the maximum of record is 800 second-feet in June 1896. Three hundred and twenty-three second feet was measured on August 2, 1905, the latter flow being recorded four days after the peak of the flood had passed. The normal flow of the river below the junction with the Stinking Water creek must be in the neighborhood of 100 second-feet.

NIOBRARA RIVER. Niobrara river rises in eastern Wyoming, about 30 miles west of the Nebraska-Wyoming line, and flows eastward, crossing the line 24 miles south of the northwest corner of Nebraska. This stream enters the state as a continuously flowing stream, from which fact it derives its Indian name "Niobrara," meaning "running water." The settlers located upon the headwarters still call it Running Water.

The river enters the state at an elevation of 4,700 feet, flows southeasterly for a distance of about 20 miles, where it turns to the eastward and, flowing near the northern boundry line, empties into the Missouri river in Knox county, near the city of Niobrara, at an approximate elevation of 1,200 feet. The upper course of the river has a fall of 13 feet to the mile, while that of the lower course is very much less, the average fall for the entire distance across the state being about 10 feet per mile.

In the upper course the river flows through a relatively shallow valley on the summit of the high table lands lying between the Platte and the White rivers. The bottom of this valley is 400 to 500 feet below the crest of the bordering Pine Ridge, and yet it is 300 feet above the level of the North Platte river and 500 feet above the valley of the White river. The valley bordering the river averages about ½ mile in width and generally has gentle slopes to the uplands.

Throughout the middle course, the stream flows through a deep canyon 100 to 300 feet below the bordering table lands. The large sandhill area of the north-central portion of the state borders the river on the south through Sheridan, Cherry, Brown, Rock and Holt counties. This area acts as a storage reservoir for the rainfall and afterwards supplies the run-off through springs, thus equalizing and making the flow very constant.

The rainfall along the course of the river ranges from less than 16 inches at the west line of the state to 24 inches where the river empties into the Missouri river.

As the flow of the river in the upper course is small, the acreage now under irrigation utilizes the normal flow. There would be a possibility of increasing this acreage through the development of suitable reservoir sites and the storage of the normal winter flow and the spring floods. For the records of the flow at different points on the river see hydrographic report of the state engineer of Nebraska for 1914.

WHITE RIVER. White river has its source west of Andrews, from springs which supply a continuous flow throughout the entire year. The river flows in an easterly direction along the face of Pine Ridge for a distance of about 20 miles, then turns to the northeast and crosses the state line into South Dakota, 61 miles east of the northwest corner of Nebraska.

The river rises at an approximate elevation of 4,800 feet, and in the first 20 miles it has a fall of 1,100 feet, but for the remainder of the distance the fall is very much less and the river crosses the state line at an approximate elevation of 3,000 feet. To the west of Crawford the valley begins to widen out and soon merges into a rolling plain at the foot of Pine Ridge.

Many tributaries, having their sources from springs in the deep canyons on the north face of Pine Ridge, increase the flow of the river. The principal ones are White Clay, Ash, Indian, Chadron, Bordeaux and Beaver creeks. The tributaries from the north and west rise in the

rolling country and supply only an intermittent flow as they are usually dry during the summer months. Soldier, Little Cottonwood and Big Cottonwood creeks are the principal tributaries from the north and west.

Irrigation is practiced along the river and most of its tributaries, but the small flow of these streams during the summer is the determining factor in the number of acres actually brought under irrigation.

This section of the state is subject to periodic floods during the early spring months that cause considerable damage to dams built for diverting water for irrigation. By the storage of these flood waters a much larger area could be brought under irrigation. One storage reservoir in the vicinity of Crawford was partially completed and then abandoned on account of difficulties encountered. This site could be utilized by building a new intake canal on a lower level and the flood waters stored for use upon lands lying around Crawford. No guaging station has been maintained on the river, but many guagings have been made. These show the flow to range from 5 to 400 second-feet, the latter having been taken at some flood peak.

HAT CREEK. Hat creek has its source from springs in a deep canyon on the north face of Pine Ridge a short distance east of the town of Harrison. It flows in a northerly direction for a distance of 20 miles and crosses the Nebraska-South Dakota line 19 miles east of the northwest corner of Nebraska. There are many tributaries which also rise from flowing springs in deep canyons on the north face of Pine Ridge, but the supply of water coming from each is small. The depth of these canyons diminishes rapidly to the north and the canyons soon give place to a rolling country.

Hat creek rises at an approximate elevation of 4,700 feet and falls very rapidly, crossing the state line at an elevation of 3,650 feet. This creek is usually frozen over during the entire winter. The flow of the creek and its tributaries is small, but the streams are all subject to periodic floods, due to melting snows and heavy showers, at which times large quantities of water flow down the courses. The normal flow during the summer months is entirely utilized for irrigation and domestic purposes, but if the flood waters could be stored and utilized great benefits could be derived.

LOUP RIVER. The Loup river is formed by the junction of the Middle Loup and North Loup rivers near the town of St. Paul. The North Loup, Middle Loup and South Loup rivers have their sources in springs and lakes located in the sand-hill region of the north-central portion of the state. The principal tributaries are Beaver Creek and Cedar, Calamus and Dismal rivers. The soils in the valleys is an alluvial deposit of loam, sand and gravel, and is very fertile.

The rainfall varies from 14 to 20 inches along the headwaters of the principal tributaries to about 27 inches at Columbus, near the junction

with the Platte river. These streams are subject to a succession of floods during the spring and early summer months. While these streams have a good flow, but little water is actually diverted for irrigation.

ELKHORN RIVER. The Elkhorn river has its source in the sand-hill region in the north-central portion of the state, and winds its way through an alluvial plain to the southeast, uniting with the Platte river a few miles west of Ashland. The rainfall ranges from 24 inches along the headwaters to 30 inches at the mouth. During the early nineties irrigation enterprises were undertaken on quite an extensive scale, but no water is now diverted for that purpose.

THE LITTLE BLUE, BIG BLUE AND NEMAHA RIVERS.—These streams drain the southeastern portion of the state, but as the rainfall in that section ranges from 28 to over 30 inches, practically no water is diverted for irrigation.

STORAGE

In the western portion of the state, as has been previously noted, immense quantities of water pass down the stream at flood stages and are lost so far as irrigation is concerned. Approximately 2,000,000 acre-feet capable of irrigating and reclaiming about 600,000 acres thus flow down the streams and out of the state.

The U. S. Geological Survey has published topographical maps of part of the western portion of the state lying along the Platte and North Platte rivers. A careful study of these maps followed by a field investigation may result in the location of some available reservoir sites. Whether reservoir sites can be found along the rivers remains the subject of special investigation. Some small reservoir sites have been located and developed. The U. S. Reclamation Service has located three sites northeast of Scotts Bluff and has constructed two reservoirs, the combined capacity of which is 81,000 acre-feet. The Kimball Irrigation District has constructed one reservoir on Lodge Pole Creek, with a capacity of 7,000 acre-feet, and has located and filed upon another site and intends to build a reservoir having a capacity of 5,000 acre-feet.

In 1896 a company was formed at Crawford and undertook the construction of an irrigation project which included the construction of a reservoir near the town of Crawford. The intention was to use the direct flow of the river and draw upon the reservoir only as a secondary supply. The reservoir, which was practically completed, was located 14 miles from the headgates of the canal on a lower level than the canal, and drops would have been necessary. This project was abandoned for various reasons. This reservoir site could be utilized to store the flood waters of the White river by building a new intake canal several miles long.

No systematic search for large reservoir sites has ever been undertaken but the development of small reservoirs would greatly increase the acreage under irrigation.

UNDERGROUND WATERS

Water available for domestic use can be obtained from wells in nearly all portions of the state in sufficient quantities to insure a permanent supply. The years 1891 to 1894, inclusive, were exceedingly dry ones, and the rainfall fell far below the normal. Professor Sweezey of the State University, made investigations of the water supply from wells during 1894, when the rainfall for the state was less than 13 inches. In the extreme eastern counties he found that 33 per cent of the wells were wholly unaffected, 52 per cent showed a lowering of the water table without failure of supply, while only 16 per cent had to be abandoned or dug deeper. In the western four-fifths of the state a still more favorable condition was found to exist, and 82 per cent of the wells were wholly unaffected, 12 per cent only partially, and only 6 per cent failed entirely.

A good water supply can be obtained in all of the valleys of the different streams in the western portion of the state at depths ranging from a few feet to about 40 feet. The depth of the water is fairly uniform in each valley, but increases rapidly upon ascending the table lands, where it may be found to vary in the same locality.

UNDERFLOW

The underground waters along the Platte, Republican, Niobrara and White rivers and Lodge Pole, Pumpkin Seed and Hat creeks lies in sand and gravel strata and have a slow movement down the valley, which gives rise to the term "underflow."

The conditions of the underflow of the South Platte valley were investigated in July, 1905, by the U. S. Geological Survey.* The water-bearing strata were found to contain a large per cent of coarse gravels, and the mean velocity through these strata as determined was over 6 feet in 24 hours. This valley is supposed to have the strongest underflow to be found within the state. Two attempts have been made to tap this underflow by surface ditches. The Kimball Underflow Ditch, located on the south side of that river south of Big Springs, was constructed in a manner similar to that of a surface water ditch, but when the river bed was reached an open ditch or water-way, practically one mile in length, was opened up below the level of the river through one of the channels on the south side. In order to prevent floods from entering this channel and filling in the open ditch, a dam was built across the upper end and the water diverted into other channels. About 50 acres have been irrigated from the water supply derived. Willows have made a rapid growth

*U. S. Geol. Survey, Water Supply Paper 184.

in the ditch, and for the last few years have greatly interfered with the flow of the water. The Hollingsworth Ditch was built on the south side of the river at Ogallala by Dr. A. Hollingsworth. The upper one and three-fourths miles of the ditch was built with a 12-foot base, which lies below the level of the river, a maximum depth of 5 feet being attained at the upper end. Weirs were installed and the flow measured and found to be a trifle over 3 second-feet, with which at one time Dr. Hollingsworth irrigated between 300 and 400 acres.

There is a good underflow found in the North Platte valley. Many small tributaries have their sources in the bluffs on the south or the high table lands on the north, but the flow entirely disappears in the sandy beds before reaching the river.

The Kearney Water and Electric Powers Company is now trying to develop some flow from underflow of the Platte river, but while the undertaking has shown some indications of success it is still in the experimental stage.

The underflow of Lodge Pole creek is demonstrated by the manner in which at different places the flow disappears in the sandy bed and later reappears farther down the stream. This is also shown by the fact that all of the surface flow may be diverted at some point, yet, farther down, the stream will again be flowing the same as if no water had been diverted. This increase occurs in a direct ratio to the amount of water diverted. Owing to the increase in the flow from the underflow and from seepage a much larger acreage is actually irrigated from this stream than could be accomplished from the normal flow of the creek.

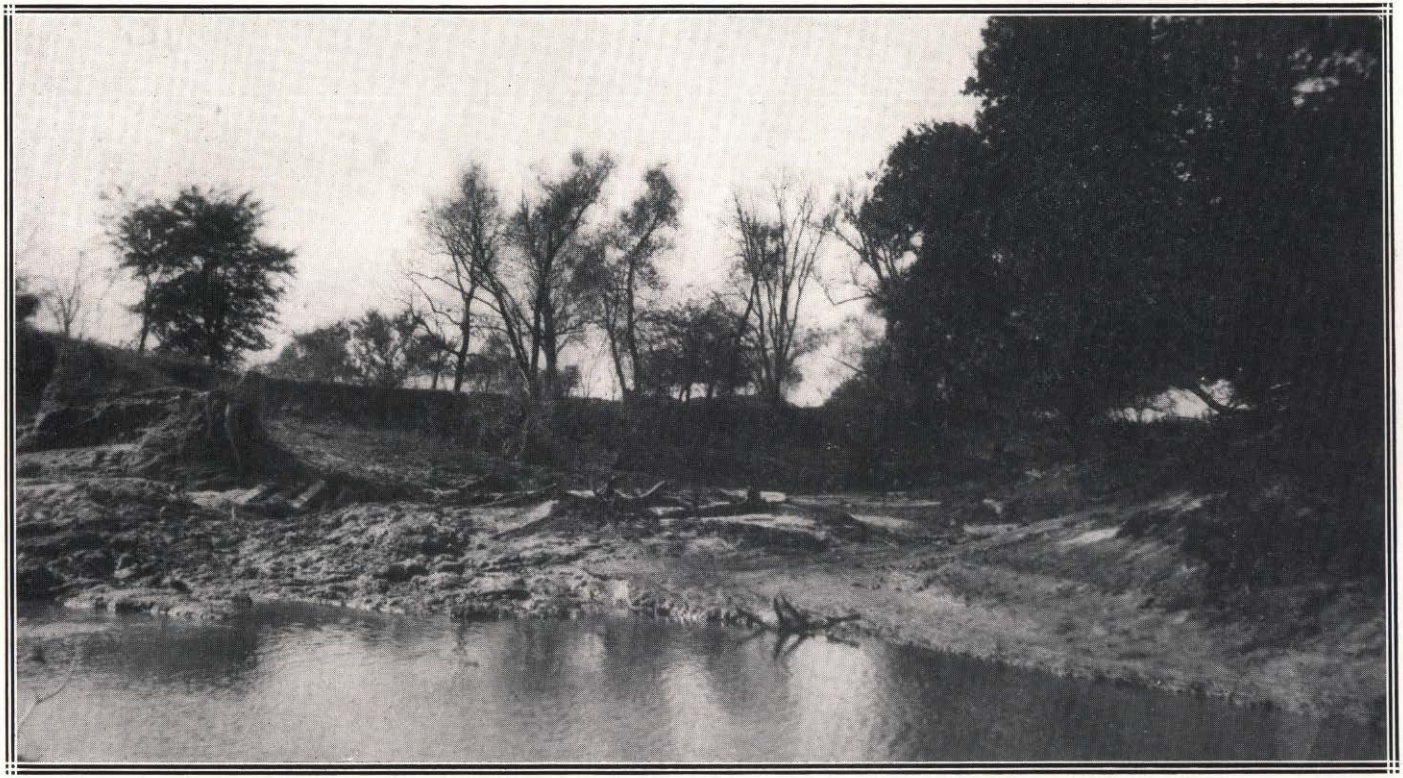
Pumpkinseed valley is underlaid by a hardpan stratum, which in turn is overlaid with a stratum of coarse sand and gravel into which the water sinks during the dry seasons of the year. This is especially true of the lower two miles of the course of the Lawrence Fork, the principal tributary.

The presence of the underflow of the Republican river has been demonstrated in the digging of wells for irrigation. A good water-bearing stratum of coarse gravel approximately 20 feet in depth has been encountered.

Springs along the course of the Niobrara river and the sandy nature of the soil indicate an underflow but no investigations along this line have been made in this valley. There are numerous springs along all of the headwaters of White river and Hat creek, but the presence of an underflow in sufficient quantities to warrant development is questionable.

SEEPAGE AND RETURN WATER

Water diverted from a stream has a tendency to percolate through the soil and seek its way back to the stream bed. The rate at which seepage takes place depends almost entirely upon the structure of the soil and the slope of the land. This movement of the water is very slow



VIEW SHOWING HOW OLD CHANNEL OF CREEK IS FILLING UP AFTER NEW DRAINAGE DITCH HAS BEEN CUT THROUGH

and it may take years for the water again to reach the main stream, but when once accomplished it becomes a source of more or less constant flow to the waters of the stream.

In the past, some investigations of the loss from seepage in canals have been made within the state. Some observations were made by the office of Experiment Stations of the U. S. Department of Agriculture on the Culbertson canal diverting water from the Frenchman river in 1901.* These observations, covering 16 miles of the canal, showed that a flow of 80.62 second-feet at the headgate was reduced to 25.19 second-feet by the time it reached the lowest point of observation.

The Mirage Canal on Niobrara river was constructed in a loose, sandy soil, and then abandoned, seepage being one of the causes, the losses from seepage being such that when 18 second-feet were diverted at the headgates only 4 second-feet could be delivered at the end of the 14th mile.

The upper end of the Crawford Citizen's Canal on White river was built in the side of the bluffs bordering the river, and the loss from seepage was such that while 18 second-feet were diverted at the headgates, no water was ever delivered below the fourteenth mile of the canal.

The loss from seepage can be so excessive as to destroy the usefulness of a canal, yet the two cases mentioned are extremes and if those same canals could have been operated for a series of years the loss from seepage might have become less. Sufficient experiments to determine the exact loss from seepage have not been made, and on account of the different formations of substrata encountered, each locality presents its own individual case for investigation. It may be estimated roughly that in the old canals about 30 per cent of the amount of water to be diverted at the headgates is lost in conveyance.

In addition to the actual loss of flow encountered, seepage has other features which prove objectionable. Returning waters from more or less of a gradient back to the main stream, and whenever low lands are encountered seepage water rises to the surface and forms lakes. The return of seepage water has become a serious factor in the irrigated districts along the North Platte river.

During the fall of 1912, the U. S. Reclamation Service made a series of observations on the seepage from the North Platte project and found a flow of over 100 second-feet. This had gathered in the natural draws and was returning to the North Platte river as surface flow.

HISTORY OF IRRIGATION DEVELOPMENT

At the beginning of the Civil War there were less than 25,000 people residing in the area now included in the State of Nebraska, and most of the settlement was in the lowlands along the Missouri river. At the close of the war thousands of men, mustered out of the army, turned

*U. S. Dept. of Agr., Office Expt. Stas. Bul. 119, p. 303.

their faces toward the life of adventure and excitement to be found in the west, and by March 1, 1867, when the state was admitted into the Union, it had a population of not less than 100,000.

These pioneers encountered numberless hardships peculiar to the country, such as devastation of crops by grasshoppers and failure by drouth. As civilization pushed on westward it encountered a decrease in the rainfall and the growing of crops was a speculation or gamble, as in many cases it was impossible to harvest more than one crop in two or three years. Some of the early settlers, formerly residing in irrigated sections or having heard of what was being accomplished by irrigation, made investigations and then proceeded to apply irrigation to alleviate the conditions encountered.

The first irrigation within the borders of the state was undertaken in the spring of 1866, when John Burke, residing near of Fort McPherson, located about 22 miles east of the present town of North Platte, built a ditch about four miles long, which tapped the Platte river on the south side about 16 miles east of the present site of North Platte. Mr. Burke irrigated only a small area, raising vegetables and corn which he sold to the soldiers at the fort and to immigrants on their way westward. Early settlers claim that the soldiers also used this ditch to grow some vegetables used at the fort.

No further attempt at irrigation was made until 1871, when enterprises were undertaken along the South Platte river and Lodge Pole creek. Josiah B. Parks and Guy C. Barton incorporated an irrigation company, the first organized within the state, and built a ditch which tapped the South Platte river on the north side, about three miles west of the town of North Platte. This ditch was used for a period of years, then followed a few seasons of heavy rainfall and then a period of nearly ten years of inactivity in irrigation in this section. A fort was established on the present site of North Platte and many claim that the soldiers dug a lateral from the ditch constructed by Parks and Barton and irrigated a garden patch at the fort. The lines of the ditch and of the laterals can be traced by the rows of large trees which remain.

During the same year, 1871, General Dudley employed the soldiers garrisoned at Fort Sidney in building a dam across Lodge Pole creek and in digging a ditch which was used for irrigation. Each company was allotted a tract of ground and there was great rivalry to grow the finest garden. The soldiers had the reputation of taking the first prizes at the state fairs whenever they made a display. A tract of 10 acres was irrigated and enough produce was raised to supply 250 enlisted men, the officers and their families, and in addition several hundred dollars worth of produce was sold each year in the town. When the fort was abandoned in 1894, trees two to three feet in diameter were flourishing.

In the late seventies and early eighties irrigation development began in other sections of the state. In 1879, the Bay State Cattle Com-

pany built a ditch to divert water from Pumpkinseed creek to flood wild-hay lands. The extreme northwestern portion of the state followed next, the West Hat creek ditch in Sioux county being built in 1880 by B. R. Brewster. This ditch is still in operation. In 1882, the Phelan Ditch was built from Rock Creek, a tributary of the Republican river in Dundy county. In 1883, enterprises were undertaken in the North Platte and White river valleys. M. Jacobson built a small ditch on the headwaters of the White river and used water for irrigation for many years. Isaac Dillon, T. J. Foley and others, organized the North Platte Land and Irrigation Company and built the North Platte Canal, the first irrigation enterprise of any magnitude in the state, during the years 1883 and 1884. This canal is still in operation and is described in detail on page ——.

The Lakota Ditch, built by B. Richards in 1884, was the first irrigation enterprise undertaken in the Niobrara valley. In 1887, the Harlem and Aberdeen ditches were built in the upper valley of the Frenchman river, and 1888 Andrew Carson built the Carson Ditch No. 1, which was the first to divert water from the Republican river.

With very few exceptions, the first attempt at irrigation within any one valley was undertaken as a private enterprise. As the practice of irrigation developed and larger and more costly ditches were built, farmers organized into partnerships and mutual companies wherein each party bore his share of the expense of building the canal. An era of speculation followed. Many parties rushed in and posted notices of appropriation and in some cases did a little construction work, and then organized companies to which they sold their rights at exorbitant prices. This soon led to a period of wild speculation which reached its height along the North Platte and Platte rivers. If all of the landowners under some of the canals could have been induced to purchase water rights the stockholders of these companies could have retired wealthy. One cattle company having large land holdings made surveys and started construction work on a few scattered portions of a large canal and then placed their lands on the market as irrigable lands located under a large irrigation project, but as soon as all of the lands were disposed of at good prices the company stopped work on the canal and withdrew from the field.

In some cases ditches were commenced out of spite or to force other ditches to certain terms. Such a case was that of a small ditch started for the purpose of forcing the owners of a larger ditch to terms over the price of water rights. The small ditch was abandoned as soon as terms were agreed upon.

A considerable number of canals were built at different places throughout the state during the latter eighties, but the greater portions of the irrigation systems were built during dry years from 1891 to 1895. In fact, appropriations amounting to three times the normal flow of the North Platte river were filed during these years. This drouth was particularly disastrous in Nebraska, as there were practically no crops of any kind harvested during the years 1891-92-94.

The years immediately following the period of drouth were years of copious rainfall, and crops were raised through the greater portion of the state without irrigation. During this period many farmers refused to keep up the payments on the thousands of dollars of bonds that had been expended in the construction of the various enterprises in which they were directly interested. Many others refused to rent water from the stock companies that had built canals for the purpose of annually renting or selling water to the farmer. As a result, many ditches, especially those located across the center of the state, were allowed to deteriorate and in some cases were actually abandoned.

The comparative drouths during the years 1910, 1911 and 1914 have been instrumental in reviving interest in irrigation, and there has been considerable talk of opening up and utilizing some of the old canals that have been practically abandoned, thus reviving the water rights before they had become void through non-use.

An important factor in the irrigation development of the state was the passing of the Irrigation District Law of 1895. More and more districts are being organized under this law each year, and the general acceptance of this law throughout the irrigated sections of the state will result in better and settled communities, more intensified farming and richer and more prosperous localities.

THE FOLLOWING TABLE SHOWS BY STREAMS THE NUMBER, ACREAGE COVERED, MILEAGE, AND COST OF IRRIGATION SYSTEMS CONSTRUCTED AND OF SYSTEMS IN OPERATION IN 1914; AND THE ACREAGE IRRIGATED IN 1912

	CANALS			MILEAGE			COST	ACREAGE			
	Number Built	Number Operated, 1914	Per Cent Operated, 1914	Total Built	Operated, 1914	Per Cent Operated, 1914	Construction	Under Canals Built	Under Canals Operated 1914	Per Cent 1914	Irrigated in 1912
North Platte River	57	39	68	783.0	649.0	83	$ 9773014	421911	368159	87	185800
Pumpkinseed Creek	42	36	86	67.2	57.1	85	26839	10881	10361	95	5420
Other Tributaries	72	56	78	145.7	115.8	79	71666	39950	34805	87	15961
	171	131	76	995.9	821.9	82	9871519	472742	413325	87	207181
South Platte Valley	18	4	22	108.0	39.5	37	97417	33832	20492	61	9200
Lodge Pole Valley	90	71	79	146.0	122.4	84	300294	21060	19855	94	10090
Platte Valley	27	10	37	233.6	103.0	44	371889	224177	153035	68	9700
Republican River	40	9	22	164.1	62.0	38	175998	41640	23140	56	8625
Frenchman River	25	14	56	108.0	79.0	73	206446	24986	19056	76	12596
Other Tributaries	28	8	29	46.8	16.1	34	33405	10651	4716	44	1125
	93	31	33	318.9	157.1	49	415849	77277	46912	61	22346
Niobrara River	39	31	80	130.8	81.8	63	151798	20574	13543	66	6646
Tributaries	59	5	8	51.4	2.0	4	17897	6930	293	4	180
	98	36	37	182.2	83.8	46	169695	27504	13836	50	6826

THE FOLLOWING TABLE SHOWS BY STREAMS THE NUMBER, ACREAGE COVERED, MILEAGE, AND COST OF IRRIGATION SYSTEMS CONSTRUCTED AND OF SYSTEMS IN OPERATION IN 1914; AND THE ACREAGE IRRIGATED IN 1912. (Continued)

	CANALS			MILEAGE			COST	ACREAGE			
	Number Built	Number Operated 1914	Percent Operated 1914	Total Built	Operated, 1914	Per Cent Operated, 1914	Construction	Under Canals Built	Under Canals Operated, 1914	Per Cent 1914	Irrigated in 1912
White River	26	11	42	62.4	25.9	42	180765	10233	5270	52	2538
Tributaries	105	58	55	87.0	46.7	54	50415	7893	6121	78	2935
	131	69	53	149.4	72.6	49	231180	18126	11391	63	5473
Hat Creek	7	6	86	7.6	7.3	96	4610	1135	1125	99	305
Tributaries	57	28	49	43.3	25.9	60	21785	3810	2890	76	1497
	64	34	53	50.9	33.2	65	26395	4945	4015	81	1802
South Loup River	4	1	25	2.9	0.0	00	$ 6000	416	300	72	00
Tributaries	1	0	00	.2	0.0	00	300	30	00	00	00
	5	1	20	3.1	0.0	00	6300	446	300	67	00
Middle Loup River	11	2	18	98.7	4.0	4	158350	32511	761	2	150
Tributaries	3	0	00	8.0	0.0	0	5775	250	00	00	00
	14	2	14	106.7	4.0	4	164125	32761	761	2	150
North Loup River	6	0	00	68.0	0.0	00	89850	26900	00	00	00
Tributaries	5	1	20	12.1	3.0	25	4060	1520	600	40	250
	11	1	9	80.1	3.0	4	93910	28420	600	2	250

THE FOLLOWING TABLE SHOWS BY STREAMS THE NUMBER, ACREAGE COVERED, MILEAGE, AND COST OF IRRIGATION SYSTEMS CONSTRUCTED AND OF SYSTEMS IN OPERATION IN 1914; AND THE ACREAGE IRRIGATED IN 1912. (Continued)

	CANALS			MILEAGE			COST	ACREAGE			
	Number Built	Number Operated 1914	Per Cent Operated	Total Built	Operated 1914	Per Cent Operated, 1914	Construction	Under Canals Built	Under Canals Operated 1914	Per Cent 1914	Irrigated in 1912
Loup River	1	0	00	11.0	0.0	00	50000	.....	.....	00	.....
Tributaries	5	1	20	13.4	0.6	4	52300	450	120	37	00
	6	1	17	24.4	0.6	2	102300	450	120	37	00
Total for Loup Drainage Basin	36	5	14	214.3	7.6	3	366635	62077	1781	3	400
Elkhorn River	6	0	00	15.1	0.0	00	20750	9260	00	00	00
Totals for State	734	391	53	2414.3	1441.1	60	$ 11871623	951000	684642	73	273018

Fifty-three per cent of all of the canals built within the state and 60 per cent of the total mileage constructed were in operation during 1914. There were over 684,000 acres lying below the 1,441.1 miles of canals in operation, but only approximately 50 per cent of this acreage was irrigated during 1914. The causes for this condition vary on different streams, and in some cases even in different sections of the same stream. Thus along the upper portions of the North Platte river, 87 per cent of the canals built and 99.2 per cent of the mileage constructed were in operation during 1914; 230,257 acres could have been irrigated from the canals and mileage in operation, yet only approximately 50 per cent of that acreage was irrigated. This condition was due to several causes: The normal flow of the river is not sufficient to supply the entire acreage under canals; some canals cover lands for which water rights have not been granted, and while the lands lie below the canals water can not be used upon them; and some of the bottom land which was formerly irrigated is now either subirrigated and no water is applied or has become seeped and drainage is necessary to make it productive. In the middle section of the North Platte river where most of the unused ditchs are located, the non-use is due chiefly to the construction of canals for an acreage larger than could be supplied by the normal flow of the river and to the subirrigating of lands.

Lodge Pole creek is the most completely utilized stream within the state, yet the percentages, while high, show that acreage under canals can not be supplied by the normal flow of the creek.

The Frenchman river is in a class by itself, as while only a small percentage of the canals built were in operation, a high percentage of the acreage lying under the canals in operation was irrigated. This is explained by the fact that the small canals covering small areas were not operated while the few canals that were in operation covered large areas, the greater portion of which were irrigated.

The canals along the South Platte river were constructed at a period when there was a sufficient flow in the river to supply them. Later diversions were made in Colorado and the part of the river in Nebraska is dry for the greater portion of the year. There is little, if any, prospect of increasing the irrigated area under these canals.

The conditions along the Republican, Niobrara and White rivers and Hat creek may be attributed to the construction of too many canals for the normal flow of the streams, and it is very doubtful if the acreage irrigated during 1912 could be increased to any appreciable extent during the normal year.

The abandonment to so great an extent of the canals along the Platte and Loup rivers is due to the fact that these streams are located within that portion of the state where fair crops can be raised without irrigation. It has been demonstrated, however, that the practice of irrigation practically doubles the yield in this region.

IRRIGATED WHEAT IN WESTERN NEBRASKA

Irrigation along the Elkhorn river was practiced only for a few years during the great drouth of the early nineties, and was then completely abandoned.

The year 1914 was unfavorable for the irrigated sections of the state. Practically no rain fell after the middle of May, and thus, together with a shortage of the flow in the streams, reduced the acreage actually irrigated. It is doubtful whether the normal flow of the various streams during a normal year would be sufficient to supply enough water for any perceptible increase in the acreage irrigated.

IRRIGATION DEVELOPMENT

The development of irrigation has brought out much ingenuity, and many schemes and plans for obtaining and using water have been tried. The most noteworthy of these, mentioned in the order of their prominence, are: Gravity canals, pumping plants, windmill irrigation, underflow ditches and sub-irrigation systems.

GRAVITY DITCHES. In the early days, before irrigation was thought of, the most of the streams had some normal flow throughout the entire year. When artificial methods of applying water to the soil were attempted the cheapest manner was followed. A ditch with a lighter grade than that of the stream was built from the land up the valley and the water was diverted and carried to the land. Generally, at first, only lands bordering the banks of the stream were irrigated, but as irrigation development advanced, lands lying farther from the stream were brought under irrigation either by extension of existing ditches or by building larger, longer and more costly ditches.

PUMPING PLANTS. Pumping water for irrigation with large pumps was attempted as early as 1891, at which time a canal was built and a pumping plant installed on the North Platte river near Gering, and quite a large acreage irrigated. The price of coal and the expense of hauling it, and the other expenses of operating a steam plant ran the cost of operation, as compared with that of gravity ditches in that vicinity, so high as to be almost prohibitive. At the end of the first season the pumping plant was abandoned and the canal extended up the valley and changed to a gravity ditch.

The development of the gasoline and fuel-oil engines during the past decade has revolutionized the pumping industry. The cost of gasoline, coal oil or crude oil is comparatively low, and in addition, much labor needed for a steam plant can be dispensed with in the operation of one of these plants. The water supply is now the determining factor in the location of these plants, and many plants pumping either direct from running streams or from wells are now being installed where a decade ago a pumping plant would have been impracticable. Most of the plants are to be found in localities where the surface flow of the streams can not be depended upon to supply gravity ditches. A large acreage is now under irrigation from pumping plants, and it is im-

possible to foretell the development that will be attained in the future through the use of such plants.

WINDMILL IRRIGATION. The dry years of 1890-94 forced the farmers to resort to almost any means in order to raise crops upon which to live. Windmills were used to pump water for small plots of ground, and immediately following this period windmill irrigation reached its height. Windmills of all kinds and descriptions, both patented and home-made, were used in all portions of the state and a great many small tracts of land were brought under irrigation. The U. S. Geological Survey made an investigation of the development of windmill irrigation in Nebraska, and Prof. E. H. Barbour, of the State University, prepared a bulletin which was published in 1899.*

The practice of windmill irrigation has retrograded during the last decade and there are comparatively few windmills used for irrigation purposes at the present time.

UNDERFLOW DITCHES. Many theories have been advanced for tapping the underflow of the various streams. Two open ditches have been built in the South Platte valley and while the underflow developed was not as great as anticipated, some good results were obtained. The Hollingsworth Ditch, costing about $3,000, furnished enough water to irrigate between 300 and 400 acres during a season. The Kimball Underflow Ditch has not proven as successful an undertaking, but when the ditch was kept in order it furnished enough water for about 50 acres during an irrigating season.

SUB-IRRIGATION. Sub-irrigation by the use of pipe lines placed below the surface of the ground is still in its infancy. Such systems cannot be installed and profitably operated unless the conditions are favorable, consequently before a system is installed, careful investigation should be made to determine whether the soil and subsoil are adapted to it. The irrigator also must decide what type and kinds of crops are to be grown. The water in a system designed for deep-rooted crops is applied too far below the surface for shallow-rooted crops, and if deep-rooted crops are grown when the system has been designed for shallow-rooted crops there is danger of the roots damaging the system. The first cost of installing a system ranges from $100 to $200 per acre.

Several sub-irrigation plants have been installed in different localities in the state. An experimental plant was installed several years ago by a company at Alliance and operated during one season. The water was pumped from a well by a windmill and stored in a tank which had a capacity of about ten barrels. The tank was connected to the mains and the water supply regulated by valves at the tank and at various places in the field. The results of the experiment could not be obtained for this report as the plant has been entirely abandoned. Statements have

*U. S. Geol. Survey Water-Supply Paper 29.

been made that the failure was due to the water supply in the well being insufficient, and to the capacity of the tank being too small. The real cause, however, probably was due to the fact that the local soil conditions were not adapted to sub-irrigation. A sub-irrigation plant covering five acres has been installed near Lincoln, but the results obtained have not proven very satisfactory.

DUTY OF WATER

"Duty of water" is a term used by irrigation engineers and irrigators to denote the relation between the quantity of water used and the acreage irrigated. It is expressed either in acreage per unit of flowing water, as 70 acres per cubic foot per second, or, in quantity of water per unit area of land, as 3 acre-feet per acre.

The laws of Nebraska formerly granted a maximum of 1 second-foot, continuous flow for every 70 acres, which was equivalent to about 6 acre-feet per acre during the irrigation season. This law was amended in 1911, so that while a water right is still based upon 1 second-foot for every 70 acres the amount which can be applied during one calendar year is limited to 3 acre-feet per acre.

Most of the best irrigators in the state formerly resided in irrigated districts of some other state and the suggestion and operations of these persons are followed by the beginner in irrigation without question. In most irrigated districts throughout the United States the normal flow of the streams have been over-appropriated several times, and the amount of water an irrigator is permitted to use is limited except in exceptional years. After removing to Nebraska where the amount of water that could be used was not so limited, these same persons advance the theory that the more water applied the greater will be the yield of crops. This has resulted in water being applied in Nebraska without much regard to what is the most beneficial or economical amount. But few experiments have ever been made in the state with a view of showing the farmer what is the right amount of water to use. With very few exceptions none of the ditch companies or persons interested in irrigation have ever attempted to measure the water used, so that comparisons could be made. The best records are those of the Interstate Canal, operated by the U. S. Reclamation Service. Under that canal the water used by every farmer is measured at his lateral headgate, but no further attempt has been made to measure or determine the amount of water used upon the various crops. During the growing season of 1911, when the rainfall from October 1, 1910, to October 1, 1911, was 10 inches, an average of 4.26 acre-feet per acre was measured to the acreage irrigated. Thus sufficient water was applied and fell as rain to cover the lands to a depth of 61 inches. During the growing season of 1912, when the rainfall from October 1, 1911, to October 1, 1912, was 20 inches, an average of only 2.25 acre-feet was measured to every acre irrigated, making a depth of 47 inches of rainfall and water applied. For the same period of the years 1913-4, 2.49 acre-

feet were applied, which, together with the rainfall of 15.90 inches, made a total depth of 45.78 inches during the year.

During the irrigating season of 1914, the Gering Irrigation District diverted 43,837 acre-feet from the North Platte river. Assuming transmission losses to have been 30 per cent—1 per cent per mile of the main canal—only 30,686 acre-feet were applied to approximately 12,000 acres irrigated, or approximately 2.56 acre-feet per acre, or a depth of 30.7 inches. Some of the canals in the vicinity of Kimball rotate in the use of the flow of the stream. In one of the rotation periods one user used the entire flow of the creek, 200 acre-feet, upon only 70 or 75 acres. Early in the spring of 1912, a ditch holding a subsequent right from White river used the flow of the river for three weeks before the prior rights along the river demanded the flow of the stream. Parties having lands under this ditch, when asked how much water had been used, replied that they had not covered the land more than 1 inch deep, yet enough water had passed through the headgate to have covered every acre irrigated during the period to a depth of 36 inches.

In addition to injuring a crop, an excessive use of water is very apt to injure the land. This may occur in several ways, namely: The land may become seeped or water-logged and the soil become cold and unproductive; or the white or the black alkali salts in the soil may be dissolved, brought to the surface, and deposited, thus destroying the fertility of the soil.

The best amount of water to apply varies in different localities, and depends among other things, upon the soil, subsoil, the water supply, the seasons, and the crops grown. It can be determined only by careful observation, investigation and experiments.

IRRIGATION LEGISLATION

The first law relative to irrigation was passed by the Legislature of the state in 1877. This law enabled corporations formed to construct and operate canals for irrigation and other purposes to acquire rights of way; and declared such works internal improvements.

The Saint Raynor law, the first general irrigation law, was passed in 1889. It provided for the appropriation of running waters for useful or beneficial purposes by posting a notice at the point of diversion, a copy of the notice to be filed with the county clerk of the county in which the diversion was located, and construction to be begun within 60 days and prosecuted diligently and uninterruptedly to completion. The law provided that irrigation works should be exempt from taxation; that the same land should not be covered by more than one ditch or lateral without the owner's consent; that irrigation works were internal improvements; that water from one stream should not be turned into another stream; that righs of way could be condemned for irrigation purposes; that excessive amounts of water should not be used; and that the waters appropriated should be distributed in certain ways. Under this law

there was no way of knowing the value of a right except by going into court, and a right was always open to attack.

The people of the western portion of the state wished to have some state control over water rights, and in 1891 an irrigation convention was held at Lincoln and drafted a bill. This bill was introduced in the Legislature that winter but was defeated. Another bill almost identical with the first was introduced in the legislature in 1893, but was defeated after a spirited fight, and the friends of irrigation had to be contented with an amendment to the Saint Raynor law allowing water rights to be filed on streams 20 feet or over in width, and permitting water, under certain conditions, to be turned from one stream into another. The members of the Legislature from the eastern portion of the state feared that the passage of an irrigation code would be looked upon as an advertisement to the outside world that the rainfall in the state was not sufficient to produce crops, and that this would have a tendency to check settlement. The complete failure of all crops because of the drouth in 1894, caused the question of adopting an irrigation code to be made a campaign issue that fall. The Legislature in 1895 passed an irrigation code modeled after the Wyoming code, and also an irrigation-district law modeled after the Wright irrigation district law of California. The irrigation code created a state board of irrigation, consisting of the governor, the attorney-general and the commissioner of public lands, the governor being ex-officio president of the board, and divided the state into two water districts.

The law provided that at the first meeting of the state board it should elect a secretary, who should be a hydraulic engineer of theoretical knowledge and practical skill and experience, and an under secretary for each of the water divisions, and that it could employ an assistant secretary and such other assistants as might be necessary. The board, either directly or through its secretary or under secretaries, was charged with the measurment of all streams in the state; the determination of priorities and amounts of all claims initiated prior to the passage of the law, and the issuance of certificates of appropriation for claims found valid the distribution of all waters appropriated; the receiving, recording and considering of all future applications for permits to appropriate water; the granting of permits, if there was any unappropriated water in the streams and the appropriation asked for would not in any other way be detrimental to the public welfare; and the issuance of certificates of appropriation when satisfied that the applications had been perfected according to law.

This law, besides granting the board certain police powers and fixing penalties, defined standards of measurement, dedicated the water of the state to public use; fixed the date of priority of applications and the order of preference in using water for different purposes; granted the right of eminent domain for irrigation works; exempted irrigation works from taxation; and provided for mutual irrigation companies.

In 1895 to 1911 a number of minor changes were made in the irrigation code, most of which were for the purpose of assisting the state board

in its administrative work. At the sessions of the legislature in 1911 and 1913 practically the entire code was revised and re-enacted, with amendments. Among some of the more important changes made were the following:

The "State Board of Irrigation" was changed to the "State Board of Irrigation, Highways and Drainage;" the board was charged with the duty of examining into the condition of all water appropriations and of holding hearings and cancelling rights where the water had not been used for beneficial purposes for more than three years; the maximum amount of water that a tract could receive was limited to 3 acre-feet per acre per year; irrigation works were declared common carriers and the rates for water were to be determined by the state railroad commission; and the lists of all lands to be irrigated were required to be filed with the superintendent of each water division April 1 of each year.

The irrigation-district law has been amended from time to time since its passage in 1895. The main provisions at present are as follows:

A majority of the electors, who also own or hold by leasehold a majority of the lands in the district susceptible of irrigation from a common system of works, may petition the county commissioners of the county in which the land, or the greater portion of it, lies, asking that an irrigation district be created including all the land. A copy of the plans, etc., submitted to the county commissioners must be filed with the state engineer, who must examine them and submit a report to the board of county commissioners at the meeting set for the hearing of the petition. If the petition, either in its original form or in the amended form, is approved by the board of county commissioners, the board divides the proposed district into three divisions, and calls an election to vote upon the organization of an irrigation district and to elect a director for each division, if the vote is favorable to organization. If upon canvassing the vote the county commissioners find a majority favorable to organization, the district is declared organized, and the directors elected meet and organize. The board of directors has control of the affairs of the district in a general way and is authorized to make surveys, acquire rights of way, and to secure lands, water or other property by purchase or condemnation. All surveys, maps, plans and estimates must be made under the direction of a competent engineer and sent to the state engineer, who shall file a report upon them with the board of directors. Having determined the amount of money required, the board of directors calls a special election to vote on the question of issuing bonds, and if a majority of the votes are in favor of issuing bonds, a special proceeding is begun in the district court to have the bonds examined, approved and confirmed. If the bonds are confiirmed they are sent, together with a history of the district, to the auditor of public accounts for registration if he finds the law has been conformed with in all respects. When registered, the bonds may be sold at 95 per cent of their face value, or if not sold, can be used to pay for property or for construction at their par value. The bonds and interest are paid from the revenues

derived from an annual assessment upon the real estate in the district. They bear interest at 6 per cent, and unless otherwise provided by a majority vote at the time of issuance, a certain per cent is payable each year, beginning with the expiration of the eleventh year. This per cent can not be less than 5 at the end of the eleventh year. After the eleventh year the minimum increases 1 per cent a year through the eighteenth year, and is 15 per cent in the nineteenth year. All the bonds must be paid upon the expiration of the twentieth year. The secretary of the board of directors certifies to the county clerk the amount of money needed each year for the payment of interest, bonds and for operation and maintenance, and the taxes are collected by the county treasurer at the same time that other county taxes are collected.

The administration of the irrigation laws of the state is in the hands of the state board of irrigation, highways and drainage, the executive member of which is the state engineer. The state is divided into two districts, each in charge of a water superintendent, and each district is divided into divisions in charge of water commissioners, who report to the superintendent and are paid from the general funds of the counties in which their services are rendered.

Information concerning water rights can be obtained by inspecting the records of the state board and by consulting the state engineer. The irrigation laws have been published in pamphlet form, and copies may be obtained by addressing the state engineer.

IRRIGATION ENTERPRISES

There is no Carey Act project within the state, and with the exception of the Interstate Canal, built and operated by the U. S. Reclamation Service, all the canals in the state are operated under the following organizations:

1. Individual or partnership ownership.
2. Mutual irrigation companies. These are corporations or associations organized under the laws of the state for irrigation purposes, and deriving no revenue from the operation of such works.
3. Stock companies. These are corporations, and in some cases the stock is owned entirely by non-landowners; in others, chiefly by non-residents, of which only a few own land under the canal; and in other cases, by only a part of the landowners under the canal.
4. Irrigation districts.

Along small streams where only a small amount of water can be diverted, nearly all the canals fall under the first class. On the larger streams, canals operated under each of the different types of organization are to be found. Each type of organization has been attended with success and with failures. The results in each case usually can be traced to the circumstances and conditions encountered, and the methods employed in surmounting them.

Owing to the great number of enterprises that have been under-

taken, it is not practicable to undertake to describe them all. In the following pages the more important ones within each drainage basin will be discussed, pointing out the early history, location, principal features of the system, and the success or failure, if of such a nature as to be out of the ordinary. The order of the priority of canals is not discussed, but the docket and application numbers are given in the tables.

Irrigation in the North Platte Drainage Basin

The irrigable lands of the North Platte valley lie in three distinct sections. Extending eastward from the Nebraska-Wyoming state line to the vicinity of Bridgeport there is a very narrow strip of bottom lands adjacent to the river, beyond which there is a series of benches each of which lies fairly level and is higher than the previous one. The soil of these upper benches is very fertile and upon the application of water becomes very productive. This portion of the valley embraces the most important irrigated section of the state.

In the vicinity of Bridgeport, the bottom lands begin to widen, the ascent to the bluffs bordering the valley is rather abrupt, and there are no benches similar to those found in the western portion of the valley. On the north side of the river this condition extends down the river to the junction with the South Platte river, and on the south side to the vicinity of Sutherland, where the North Platte and South Platte valleys begin to merge. In this portion of the valley the water table lies close to the surface of the ground and the soil is of a more alkaline character. Most of the ditches that have been abandoned within the valley are to be found here and those still in operation, of which none is a large enterprise, are operated in a more or less indifferent manner. On the south side of the river and east from the vicinity of Sutherland to the junction of the North Platte and South Platte rivers, the lands rise and the water lies farther from the surface. The soil here resembles, to some extent, that to be found on the upper benches of the upper valley, but is not quite as fertile or productive.

There are 69 existing appropriations from the river, with a total appropriation of 5,815.62 second-feet. Of this number 19 appropriations either have been abandoned or have not been used for a number of years; 11 are merely for extensions or enlargements of existing canals. In addition, there is one canal which has its headgate across the state line in Wyoming, for which no appropriation has been made.

Fifty-seven canals have been built along the river. During 1914, thirty-nine of these were in operation, 15 being operated by irrigation districts; 11 by mutual stock companies; 2 by corporations; 5 by private enterprises; 3 by partnership and one, the largest within the state, by the U. S. Reclamation Service. Data regarding the ownership of one could not be obtained.

During the early growing months of each season the flow of the river greatly exceeds the demand for irrigation, but during the hot months of summer the flow of the river diminishes to such an extent that the

VIEW SHOWING PATHFINDER RESERVOIR NEARLY FULL

demand for irrigation usually exceeds the supply. This condition will be greatly relieved by the delivery of stored water from the Pathfinder reservoir to those canals that have taken advantage of the proposals of the Department of the Interior and have purchased stored water.

The early part of the season of 1914 was very favorable, but after the latter part of May the rainfall was below normal and there was a shortage of water. Notwithstanding this fact, the 39 canals in operation had 649 miles of ditch in operation, and this mileage covered 368,159 acres susceptible of irrigation.

This acreage was planted to various crops, each section of the valley producing those best adapted to that section. Thus in the western section the principal crops are alfalfa, sugar beets, grain and wild hay; in the middle section some general farming is done, but most of the section is given over to the production of wild hay; in the eastern section, alfalfa, wheat, corn, oats and sugar beets are the principal crops.

Alfalfa raised by irrigation is usually cut three or four times each season.

The Scotts Bluff Sugar Company has a factory located at Scotts Bluff, and in 1913, 19,051 acres were harvested and 216,353 tons of beets were delivered to the factory. In 1914, 21,035 acres were in beets and an estimated tonnage of 222,854 tons will be delivered at the factory. The factory at Scotts Bluff makes contracts for a flat rate of $5 per ton and in case the beets are siloed an additional 50 cents is paid for this extra work. The contracts also contain a clause offering a bonus of 50 cents per ton in the event that the tonnage delivered to the factory reaches a given amount. Some beets are grown in the eastern section of the valley, and these were contracted at a flat rate of $5 per ton by the American Beet Sugar Company, which has a factory located at Grand Island. Irrigated grains yield as heavily as unirrigated grains in the eastern portions of the state.

Fruit is grown on a small scale for personal use throughout the valley. The Hunter Orchard located near Sutherland under the Keith and Lincoln Counties Irrigation District canal, is the only commercial orchard in the valley. It contains 36 acres, planted to the following varieties of apples: Ben Davis, Winesap, Missouri Pippin, Janet, Grimes Golden, Dutchess of Oldenburg, Utters Red and several other varieties of both fall and winter apples in small quantities. The Winesap, Grimes Golden, Janet, Missouri Pippin and Ben Davis have proved to be the most prolific and profitable varieties. One and one-half acres are planted to cherries, of which the most profitable varieties are Early Richmond, Montmorency and English Morello. One and one-half acres are planted to plums, the Hawkeye, Wyant and Lombard being the most prolific. The orchard is pruned every other year, is kept in a thorough state of cultivation and is irrigated whenever the trees need moisture. It is sprayed three times each season.

The Union Pacific railroad has a branch line extending up the valley which places this territory tributary to the main line of that road. In

addition, the Chicago, Burlington and Quincy railroad has a branch traversing the upper section, thus giving the entire valley fairly good railroad facilities.

CANALS ALONG THE NORTH PLATTE RIVER

Irrigation is practiced in this valley on a more extensive scale than in any other portion of the state, and owing to the great area now under irrigation more of the individual canals will be discussed than will be in considering other sections.

North Platte project of the U. S. Reclamation Service (A-768).*

Soon after Congress passed the Reclamation Act (Approved July 17, 1902, 32 Stat. 388) investigations were started to ascertain the irrigation possibilities in the North Platte drainage area. These investigations showed that it was possible to construct an extensive irrigation system along the North Platte river in Wyoming and Nebraska. An irrigation project for the valley was then approved and immediate steps were taken to develop the system.

Two reservoir sites were investigated along the North Platte and Sweetwater rivers, but only one of them was found to be large enough to supply a project of any considerable size. The site selected for a dam was in a narrow canyon about 50 miles southwest of Casper, Wyoming. The building of the dam was approved in 1904 and construction was started early in 1906. The dam is of the arch masonry type with a maximum height of 218 feet and a crest length of 432 feet and contains over 60,000 cubic yards of masonry. The completed reservoir has a capacity of about 1,070,000 acre-feet and when full, submerges about 22,000 acres. In addition to the masonry dam there is an earth dike, made necessary by a low pass a short distance south of the dam.

The discharge of water into the river below the dam is regulated by means of two tunnels equipped with gates or valves. The lower, or north tunnel, was built in 1905, and is fitted with valves operated by oil-pressure pumps run by motors and gasoline engines. The higher, or south tunnel, was completed in 1912, and is fitted with gates of the balanced valve type.

Several tracts along the river were investigated with the view of building irrigation systems, all but two, however, have been abandoned. The first and larger of these two units is on the south side of the river, and extends from Guernsey, Wyo., to a point south of Bayard, Neb. This tract contains approximately 250,000 acres of irrigable land, of which about 150,000 acres lies in Wyoming, and 100,000 acres in Nebraska. The construction of the Goshen Hole canal, a high line canal, that is, one

*The information concerning the North Platte project was furnished by Mr. Andrew Weiss, Project Engineer, of the U. S. Reclamation Service, in charge of the project.

high enough to water the whole tract, has been found to be too costly to be undertaken at the present time.

The second of the two tracts is known as the Interstate Unit, and as approved extends from Whalen, Wyo., to the divide between Red Willow and Indian creeks in Nebraska. The water from the Interstate Unit is diverted from the river at Whalen, Wyo., by a diversion dam, consisting of a 300-foot concrete overflow crest and an earth dike about 2,000 feet long, built by the U. S. Reclamation Service in 1907 and 1908.

The designed capacity of the Interstate Canal at the headworks is 1,400 second-feet. This capacity is maintained for about 45 miles, and then reduced to 1,200 second-feet. Successive reductions are made in canal capacity thereafter, in accordance with the requirements, until the carrying capacity at the end of the 95th mile is 743 second-feet. The actual carrying capacity of the canal has been found to be 8 to 20 per cent more than the designed capacity. At the end of the 95th mile the main canal connects with a chain of three reservoirs, of which the first and third are now under construction, and supply the Low Line Canal and laterals, in the vicinity of Winters Creek and eastward from Red Willow creek. Reservoir No. 1, called Lake Alice, has a capacity of 14,000 acre-feet, and Reservoir No. 3, known as Lake Minatare, is built to a capacity of 67,000 acre-feet. The High Line canal is a continuation of the main canal beyond Lake Alice to a point in the northeast quarter of section 36, township 22 north, range 52 west, a distance of 36 miles from the diversion point of Lake Alice. The total length of the Low Line canal from its headgate at the outlet of Lake Minatare to its end is 42 miles. The above reservoirs are formed by means of earthern dams, containing a total of about 1,130,000 cubic yards of earth fill and 52,000 cubic yards of paving. The total length of canals now constructed is about 131 miles of main canal and about 550 miles of laterals and sub-laterals, of which about 52 miles of main canal and 14 miles of laterals are located in Wyoming. The above figures do not include the length of laterals covering the land operated by the North Platte Canal and Colonization Company, in Wyoming, as these are built and maintained by either the individual water users or associations of water users under the segregation.

The Interstate Unit is divided into four districts. The first district, located between Whalen and the sand-hills region of Torrington, Wyo., is a Carey Act segregation, containing 17,837 acres of irrigable lands under the control of the North Platte Canal and Colonization Company. The United States, under a special arrangement, delivers the amount of water for which the company has an appropriation to its lateral headgates, but has not control over the operation of the system.

The remainder of the land under the Interstate Unit is divided into three lateral districts. The first lateral district was opened to irrigation in 1908 and extends from near the state line in Wyoming to Dry Spotted Tail creek in Nebraska, and contains 36,760 acres of irrigable land. The second lateral district, with the exception of a few acres added in

1910, was opened to irrigation in 1909. This district lies wholly within Nebraska and embraces the territory between Dry Spotted Tail and Winters creeks and contains 34,100 acres of irrigable land. The third lateral district, contains about 38,000 acres of irrigable land in the vicinity of and east of Winters creek. About 15,600 acres in this district were opened to irrigation in 1911 and 1912. The remainder of the district will be opened in the season of 1915. In addition, there are some smaller detached tracts, covering about 2,570 acres of irrigable land, which will be brought under irrigation within the next few years.

The following table shows the division of the land in the districts under the canal:

	Acres.
Land of North Platte Canal & Colonization Company (Wyoming)	17,837
First lateral district, U. S. Reclamation Service, (Wyoming-Nebraska)	36,760
Second lateral district, U. S. Reclamation Service, (Nebraska)	34,100
Third lateral district, U. S. Reclamation Service, (Nebraska)	38,000
Miscellaneous tracts of United States land	2,570
Total	129,267

Of the above, 107,530 acres are in Nebraska and 21,737 acres in Wyoming.

The following table shows the land opened to irrigation from 1907 to 1914:

	Acres.
Nebraska	89,434
Wyoming (U. S. Reclamation Service)	2,229
Wyoming (North Platte Canal and Colonization Co.)	17,837
Total	109,500

Of the above, 59,000 acres under the Reclamation Act and 6,000 acres under the North Platte Canal and Colonization Company were in crop in 1914.

In accordance with the Act of Congress of February 21, 1911 (36 Stat. L. 925) known as the Warren Act, and the Act of the Nebraska Legislature of 1911 (Sec. 3451 Rev. Stat. 1913, Nebr.) the United States has sold perpetual storage rights in the Pathfinder Reservoir to six ditch systems west of Bridgeport at the cost of $5 per acre-foot. This charge is to be paid in ten annual graduated payments without interest, and has enabled the ditches to supplement their river appropriation with adequate storage rights at small cost.

During the past season the United States also rented storage water to several other systems in western Nebraska at 30 cents per acre-foot for the season. But for this, many of the systems would have suffered greatly when there was not sufficient natural flow to supply the needs of their priorities. In addition to passing the inflow into the Pathfinder Reservoir, the United States, during the irrigation season, endeavored to turn out from 500 to 1,000 second-feet more water than was necessary for the Government's project and its sale and rental projects.

The present rate of payments for land under the Reclamation Act is governed by the provisions of the Act of Congress of August 13, 1914, known as the Reclamation Extension Act. In accordance with this Act, all lands which have heretofore been subject to the Reclamation Act are subject to the building charge of $55 per acre of irrigable land, payable in twenty annual installments, without interest, the first four of which shall be 2 per cent, the next two each 4 per cent, and the next fourteen each 6 per cent. On lands which may hereafter become subject to the terms and conditions of the Reclamation Act, and on new entries, the entryman must pay at the time of making water-right application, 5 per cent of the construction charge fixed for the land as an initial installment, and shall pay the balance of the charge in fifteen annual installments, the first five of which shall each be 5 per cent and the remainder shall be each 7 per cent of the construction charge. The first of the annual installments shall become due and payable on December 1 of the fifth calendar year after the initial installment. In addition to the building charges, operation and maintenance charges, amounting to approximately $1.10 per acre per annum, are due and payable on December 1 of each season. This rate is regulated by the actual cost of this service and in accordance with Section 5 of the Reclamation Extension Act. The total cost of operation and maintenance of the project is distributed over the entire area per volume of water delivered, so that the careful user of water is required to pay proportionately less operation and maintenance charges than his neighbor, who may be less skillful or painstaking. It is expected that the operation and maintenance cost will diminish further, as the entire area under the project is put under irrigation and the system becomes thoroughly seasoned throughout.

The Fort Laramie unit, the construction of which has been conditionally approved by the Department of the Interior, will comprise a canal system on the south side of the North Platte river, which will cover about 107,000 acres of irrigable land, situated between Whalen, Wyo., and a point south of Minatare, Nebr. The main canal will take water from the river directly opposite the intake of the Interstate Canal, at the Whalen diversion dam. The capacity of the canal at the intake will be about 1,370 second-feet, which capacity will be gradually diminished to the end of the canal. The land covered by this canal will include 59,000 acres in Wyoming and 48,000 acres in Nebraska, of which 7,000 acres in Wyoming and 37,400 acres in Nebraska are in private

ownership. On account of the large proportion of the land in private ownership, the unit is approved only on condition that 95 per cent of the private landholders will pledge their land to pay their portion of the building charges of the irrigation system, and to dispose of their holdings in excess of 160 acres to parties qualified to make water-right application under the Reclamation Act.

The land under the North Platte project is divided into farm units of approximately 80 acres of irrigable land. Under the Reclamation Act a person can not obtain water for more than 160 acres of land in private ownership, nor for more than one farm unit, unless the building charges are paid up in full on each such farm unit. There probably will continue to be available for the next one or two years a number of desirable farm units, and persons interested may obtain further information relative thereto by addressing the U. S. Reclamation Service at Mitchell, Nebr.

Practically all the land under the Interstate Unit has been entered under the Reclamation Act. There are still unentered lands, as pointed out in the preceding paragraph, and also some lands located under the Low Line Canal north of Bayard and Minatare, Nebr., which are withheld from all forms of entry in accordance with the Act of Congress of June 25, 1910 (36 Stat. 847) providing that no lands shall be entered until the water is available therefor. It is expected that these remaining lands will be available for entry during the calendar years 1915 and 1916. In addition there are frequent opportunities to purchase private land or lands upon which final proof as to residence and cultivation has been made. Purchasers or intending settlers should, prior to making settlement or purchases, familiarize themselves with local conditions, the Reclamation Act, and the various public notices relating to the lands. Such preliminary investigation may save much misunderstanding and resulting troubles and difficulties. All intending purchasers should acquaint themselves with the status of the payments on any tract of land they may desire to purchase, which information is furnished free of charge by the Reclamation office at Mitchell, Nebr. As a rule it is advisable for the intending settler or purchaser to inquire of the local Reclamation Service officials regarding any tract of land or the rules and regulations of the Interior Department. The necessary information will be furnished either by letter or personally, as may be requested. Some settlers make the error of attempting to settle with too small working capital and soon find themselves in financial difficulties. It must be remembered that the cost of improvements, farm equipment, etc., necessary to start on an unimproved tract of land may easily consume several thousand dollars, and also that the returns fom these barren western soils usually are light for several years, while the expense of preparing the ground, irrigating, seeding to alfalfa, etc., is correspondingly heavy during this early period.

The following table shows the percentage of the project completed, and the cost of the same to July 31, 1914:

Status of North Platte Project, July 31, 1914

	Complete Per Cent	Amount
Storage Works:		
Pathfinder Reservoir	99.7	$1,795,330.43
Lake Alice Reservoir	97.0	209,730.19
Dam No. 3	63.0	343,451.49
Diversion Works:		
Whalen Dam	100.0	235,010.54
Canal System:		
First division main canal	99.8	1,021,276.26
Second division main canal	100.0	849,340.29
Third division main canal	83.0	361.444.65
Lateral System:		
Rawhide Lateral District	100.0	3,819.31
First Lateral District	99.8	371,892.13
Second Lateral District	99.9	299,275.23
Third Lateral District	78.0	242,102.67
Drainage System	29.4	88,030.56
Miscellaneous:		
Real Estate and Right of Way	82.0	26,796.14
Secondary Projects	100.0	51,531.40
Water-right Adjudications, North Platte river	100.0	9,473.18
Project Buildings	99.0	29,135.18
Fort Laramie Unit	.3	20,109.76
Preliminary operation and maintenance (building)	85.0	423,300.38
Total		$6,381,050.79

MITCHELL IRRIGATION DISTRICT. The Mitchell Canal and Irrigating Company was incorporated on June 20, 1890, and on the same date a notice of appropriation was posted on the south bank of the river in Laramie county, Wyoming, and on June 25 a copy was filed with the county clerk of that county. Construction started on August 18, 1890, and continued until July 1891, by which time 28 miles of canal had been built. Practically all the construction work was done by the subscribers, who were paid in stock. The total cost of building the canal was $37,500, of which about 10 per cent was used in the construction of the headgates and flumes. Cash items for these structures amounted to $3,700, which amount was raised by a bond issue authorized by the company. During the succeeding years more or less money was raised by assessments upon the stock and put into extensions and betterments.

By an agreement made in 1897, the Gering Irrigation District was

granted the right of running water through the entire length of the canal, and in return it enlarged the ditch to two and one-half times its former capacity and agreed to pay 25 per cent of the superintendent's salary and 55 per cent of the operating expenses of the joint ditch.

On June 26, 1897, twenty-three of the landowners under the ditch presented a petition to the county commissioners of Scotts Bluff county, praying for the organization of an irrigation district. On the same date the commissioners approved the petition and issued a call for an election to be held on July 24. On August 2, the commissioners met as a canvassing board and finding 22 votes "yes" and 5 votes "no," declared the district duly organized. The district had a bond election on December 20, and voted bonds in the sum of $58,000 for the purchase of all the rights and title to the Mitchell Canal and Irrigating Company. These bonds were issued under date of July 1, 1898.

The headgate of this canal is just across the state line in Wyoming, but all of the land susceptible of irrigation lies within Nebraska. While a notice of appropriation was filed in Laramie county, Wyoming, it seems that neither the former company nor the district has ever had the rights adjudicated under the laws of Wyoming and likewise never has made any application for a right under the laws of Nebraska, and consequently the appropriation is held merely under the vested right of continuous beneficial use.

Under the original company the farmers had to build their own laterals—this sometimes was done by several farmers building joint laterals—but the company built and maintained the lateral headgates and delivered the water.

The district contains approximately 16,280 acres of irrigable land, and is one of the best developed irrigated tracts in the state. Land values in the valley depend upon the improvements on the land.

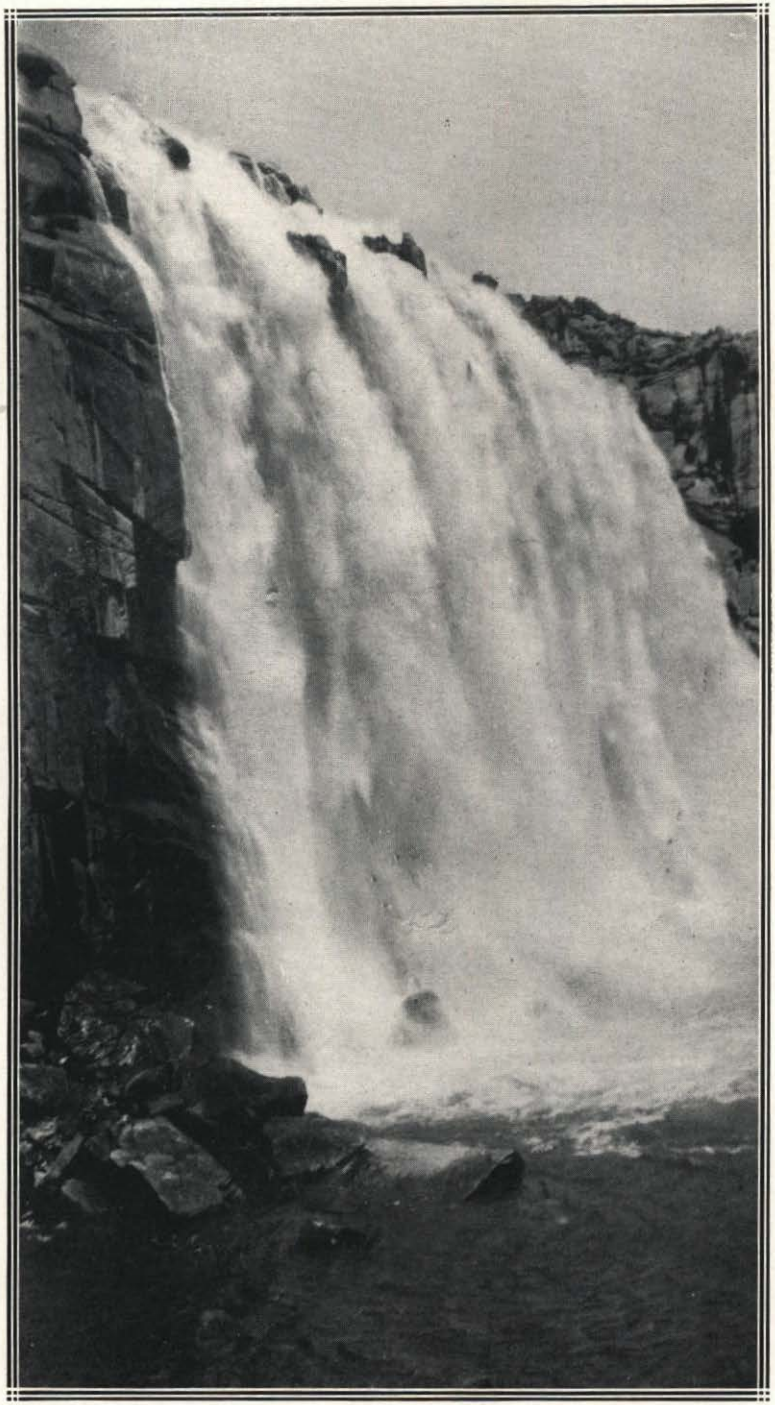
For the purpose of levying assessments to meet maintenance and operation charges, provide a bond-sinking fund, and pay interest on the bonds, the land is classified and divided into three grades, which are assessed on valuations of $5, $10 and $15 per acre, respectively. The levy for maintainence and operation for 1914 was 45 mills and that covering bonds was 55 mills, making the charges for water per acre as follows:

Land Valuation	Maintainence and Operation	Bonds and Interest	Total
Dollars	Cents	Cents	Dollars
5	22½	27½	.50
10	45	55	1.00
15	67½	82½	1.50

The principal crops raised are alfalfa, sugar beets, potatoes, oats and other small grains.

This district is cited as the most successful and prosperous districts within the state.

GERING IRRIGATION DISTRICT (A-365). On July 8, 1895, fifty-seven landowners filed a petition with the county commissioners of



WATER WASTING OVER WASTEWAY OF PATHFINDER RESERVOIR, SEASON 1914

Scotts Bluff county praying for the organization of an irrigation district and on the same date the commissioners met, approved the said petition, and called an election to be held on August 3. On August 12, the commissioners met as a canvassing board and finding 48 votes "yes" and 1 vote "no," declared the district duly organized. Completed surveys showed that some non-irrigable land had been included within the borders of the district as organized, and after due process of law, this was excluded and the final boundaries established embracing an irrigable area of 14,700 acres.

The district court of Scotts Bluff county passed upon and confirmed the legality of the district in 1897. During the same year an agreement was made with the Mitchell Canal and Irrigating Company, under which it was possible for the Gering Irrigation District to build headgates just east of the state line and turn the water through a short ditch into the Mitchell Ditch, taking it out again at the ending of the Mitchell Ditch. In return, the Gering Irrigation District agreed to pay 25 per cent of the superintendent's salary and 55 per cent of the operating expenses of the joint ditch.

During 1912 these items were: 25 per cent of superintendent's salary, $200; 55 per cent of operating expenses of joint ditch, $449.03.

Construction work was begun in 1898 and the ditch was completed in 1900. In addition to enlarging the 28 miles of the Mitchell Ditch, 25 miles of new canal were built. From the end of the Mitchell Ditch to just west of the town of Gering the canal had to be built through a very rough stretch of country, locally called "Bad Lands," and the cost of construction ran high. There also is one wooden flume 64 feet high just west of the town of Gering.

The ditch was built at a time when it was hard to float bonds and all construction work was paid for with bonds. From November 6, 1897, to May 31, 1902, four bond issues, aggregating $217,000 were issued as follows:

Amount	Authorized	Issued
$115,000	November 6, 1897	November 8, 1897
62,000	July 7, 1900	July 9, 1900
20,000	February 1, 1902	February 3, 1902
20,000	May 31, 1902	June 2, 1902

These issues all bear interest at 6 per cent. The bonds, instead of being retired serially, read that a percentage of each bond was to be retired each year after the tenth year. As all construction work was finished during the year 1900, it is reasonable to assume that only the first two issues, totalling $177,000, went into actual construction charges, and that the last two issues were made to meet accrued interest and betterment charges.

On September 11, 1909, an election was held and refunding bonds were issued in the sum of $217,000 to refund all previous issues. Of the refunding bonds $19,800 have not been issued, due to the fact that

part of the face value of the old bonds had been paid, and to the fact that a few of the old bonds are still outstanding.

On January 17, 1913, the district purchased for $100,000 a perpetual right to 35,500 acre-feet of stored water annually from the Pathfinder Reservoir.

For the purpose of levying an assessment to meet maintenance and operation charges, bond issues and interest on bonds, the land is classified according to its quality and valued for taxation at $10 to $20 per acre. As the water is pro-rated to the land in accordance with the assessment levied, the greater portion of the land is valued between $15 and $20 in order to gain the benefit of receiving plenty of water. The levy in 1914 for maintenance and operation was 41 mills and that for covering bonds and interest 59 mills, thus making the charge for water per acre for the best land 82 cents for maintenance and operation, and $1.18 for bonds and interest, a total of $2.

While the bond issues against this district have been high, the district is a striking example of the difficulties that can be overcome and the great cost that can be assumed, as the farmers of the district have been successful.

During the year 1914, water was applied to about 12,000 acres. The principal crops grown are alfalfa, sugar beets, potatoes and some small grain.

FARMERS' IRRIGATION DISTRICT (D-918; A-660). The Farmers' Irrigation District, or Tri-State Project as it is called, is second in size and importance in the state, and by far the largest enterprise constructed by private capital.

On August 31, 1887, some settlers, who formerly had lived in the irrigated sections of Colorado, organized the Farmers' Canal Company, and on September 16 posted notices of appropriation on the north bank of the river in Section 10, Township 23 north, Range 58 west. Copies of the notices were filed in the office of the county clerk of Cheyenne County, which at that time included the territory now in Scotts Bluff county. This was the first instrument making claim for irrigation purposes to be filed within the state.

Construction was begun in 1888 and continued until 1890, at which time the canal had been completed for a distance of 10 miles, at a cost of about $7,800. The work was done by the stockholders, each being assigned a certain stretch of work which was estimated to represent the amount of the stock subscribed by him. In 1891, these farmers, finding that they were not financially able to complete the work, sold the canal, reserving perpetual water rights to themselves, to a company which was promoting a much larger project, and wished to use the line of the canal as its right of way.

This succeeding company authorized a bond issue of $250,000 and proceeded to enlarge and extend the canal by opening up detached stretches through a distance of 25 miles. It was forced to cease construction in 1893 on account of the inability to float more bonds. The

actual cost of construction undertaken amounted to about $86,000, which, together with the accrued interest, brought the total to approximately $100,000. Not being able to meet the accrued interest or the bonds falling due, foreclosure proceedings were brought in 1898, and the canal sold by an order of the court in 1901.

On March 4, 1897, twenty-eight landowners under the canal filed a petition with the county commissioners of Scotts Bluff county, praying for the organization of an irrigation district, and on March 17 the commissioners approved the petition and called an election to be held on April 10. On April 19 the commissioners met as a canvassing board and finding 29 votes "yes" and 1 vote "no," declared the district duly organized, but this organization did not obtain control of the canal at this time.

The Tri-State Land Company, with an authorized capital stock of 160,000 shares of the par value of $100 each, was organized in 1904 and purchased the rights of the Farmers Canal Company. In 1905 they began to enlarge and extend the canal. To supplement the appropriation from the river this company in 1912 purchased at a cost of $500,000 a perpetual right to 180,000 acre-feet of stored water annually from the Pathfinder Reservoir.

On October 14, 1912, the landowners within the irrigation district as organized in 1897, held an election and voted bonds in the sum of $2,550,000, with which to purchase the canal system and water rights of the Tri-State Company. At this election, additional bonds in the sum of $153,000 were voted to be used in making some improvements and meeting the accrued interest at the end of the first year. These bonds were issued under date of January 1, 1913. The district comprises an area of about 65,000 acres of irrigable land, most of which is situated on the table-lands and includes some of the finest irrigated farm lands to be found within the state.

The headgate of the canal is 1 mile east of the Nebraska-Wyoming state line. The canal has a bottom width of 90 feet for 2 miles, a width of 46 feet for the next 35 miles, and then is gradually reduced in size to the end. The present length is 73 miles and there are approximately 300 miles of laterals. The cost of construction was about $2,500,000, which was met by the paid-up capital of the company and a bond issue of $1,700,000.

The needle dam at the intake, the concrete headgates and the elaborate concrete wasteway are the most interesting features of the project. The wasteway is located two miles below the headgates and is so constructed that the accumulation of sand and sediment can be flushed out without trouble or extra expense. The secondary structures are nearly all of concrete, most of the laterals are fitted with measuring devices and, where necessary, with concrete drops. Laterals have been constructed to practically every 80-acre tract under the canal.

For the purpose of levying assessments to meet maintenance and operation charges and to cover bond issues and interest on bonds, the land is assessed at $35 to $45 per acre. The levy for maintenance and oper-

ation for 1914 is 20 mills and that covering bonds is 70 mills, making the charge for water per acre as follows:

Land Valuation	Operation and Maintenance	Bonds and Interest	Total
$35	$ .70	$2.45	$3.15
45	.90	3.15	4.05

The principal crops grown are alfalfa, sugar beets ,potatoes, and small grains of all kinds. The land is particularly productive after it is thoroughly subdued and properly cultivated.

RAMSHORN CANAL (D-945). On March 24, 1893, a notice of appropriation was posted by individuals on the north bank of the river in the southeast quarter of the southeast quarter of Section 12, Township 23 north, Range 58 west for the Ramshorn canal and a copy of the notice was filed with the county clerk of Scotts Bluff county. They began construction in April 1893. During 1893 the landowners under the ditch incorporated into a mutual stock company and before April, 1894, completed the canal to a length of 6½ miles at a cost of $6,250.

About 2,542 irrigable acres lie below the line of the ditch, but of this acreage only 480 acres have been irrigated during the past few seasons. The maintenance and operation assessments have been averaging about 35 cents per acre. The principal crops irrigated are alfalfa and small grains.

ENTERPRISE IRRIGATION DISTRICT (D-920). A preliminary meeting was held on January 19, 1889, at which time the landowners, residing within the territory now comprising the district, were invited to subscribe for stock in the Farmers' Canal Company, described above. This proposition was accepted at this meeting, but on February 9, 1889, the decision was reconsidered and the organization of the Enterprise Ditch Company was decided upon. Stock was subscribed for and the company organized on March 7, 1889, as a mutual stock company, with an authorized capital stock of 500 shares, with a par value of $100 each. Surveys were made and a notice of appropriation posted on the north bank of the river in Section 28, Township 23 north, Range 57 west, prior to the latter part of March, 1889, a copy of the notice being filed with the county clerk of Scotts Bluff county on March 30. Construction on the ditch was started at once, but as the projected ditch was quite long and there were not many stockholders, it was not completed until 1895, by which time the ditch had been built for a distance of 24 miles at a cost of $31,306, divided as follows: Headgates, $1,500; earthwork, $28,806; other expenses, $1,000. Water was first diverted from the river and used along the upper portion of the canal during the latter part of the season of 1890.

On May 2, 1898, twelve of the landowners under the canal presented a petition to the county commissioners of Scotts Bluff county praying

for the formation of an irrigation district, and on May 23, the commissioners approved the petition and called an election to be held June 18. On July 27, the commissioners met as a canvassing board, and finding 18 votes "yes" and 8 votes "no," declared the district duly organized. On August 15, the district voted bonds in the sum of $45,000 for the purchase of the stock of the old company. The bonds were issued under date of October 5, 1898, and the transfer to the district was made March 17, 1900. On August 7, 1910, a second issue of bonds was voted in the sum of $15,000, for the construction of a permanent headgate. These bonds were issued under date of September 1, 1910.

This district has an irrigable area of 7,275 acres, of which about 6,000 acres were irrigated during the season of 1914. The area was planted to diversified crops; alfalfa and sugar beets predominating.

For the purpose of levying assessments to meet maintenance and operation charges, and bond issues and interest on bonds, the land is classified into four grades, which are assessed on valuations of 25 cents, $10, $15 and $20, respectfully. The levy for maintenance and operation for 1914 was 50 mills and that for bonds and interest was 50 mills. Thus the charges for water per acre were as follows:

Land Valuation	Operation and Maintenance	Bonds and Interest	Total
$10	$ .50	$ .50	$1.00
15	.75	.75	1.50
20	1.00	1.00	2.00

WINTERS CREEK CANAL (D-952). The Winters Creek Irrigation Company was incorporated October 1, 1888, with a capital stock of $10,000, represented by 100 shares of the par value of $100 each. Sixteen persons subscribed for 80 shares, each share representing 40 acres of land. Surveys of the canal were completed during November 1888, and construction was undertaken the same month. No contract was let for the construction, each shareholder being allowed to work out 90 per cent of the par value of the stock subscribed; the other 10 per cent was paid in cash. During the winter the number of stockholders increased to thirty, and by May 1, 1889, about ten miles of the canal had been built. Water was diverted and was run the entire length of the canal that season. In the winter of 1889-1890, the authorized capital stock was increased to $10,700 by issuing seven more shares. The canal was enlarged and extended to its present length of 12 miles.

On January 1, 1911, the company was re-incorporated with a capital stock of $96,000, represented by 960 shares of the par value of $100 each. A large portion of this stock is now held by the Imperial Land Company, a subsidiary of the Scotts Bluff Sugar Company.

The company acts merely as a common carrier, and makes an annual charge of $2.50 per acre for the service of delivering the water to the headgate of the lateral. The laterals were built almost entirely by the farmers.

The headgates are located in Section 17, Township 22 north, Range 55 west, on a bend in the north bank of the river, and during the past, drifting sand has entered the headgates and settled in the upper portions of the canal interfering greatly with the operation.

There are 5,840 acres of irrigable land lying below the canal and during the season of 1914 water was supplied to approximately 5,000 acres. The principal crops grown are alfalfa and sugar beets, the latter predominating, as the greater portion of the land lies close to the beet-sugar factory at Scotts Bluff.

CENTRAL IRRIGATION DISTRICT (D-926). The Mutual Irrigation and Water Power Company was organized and incorporated under the laws of Nebraska. This company posted a notice of appropriation on the south bank of the river in Section 26, Township 22 north, Range 56 west, on June 23, 1890, and construction was started shortly afterward. By July 1, 1891, 4½ miles of canal had been completed, a large pump and boiler to pump from the river had been installed, and water was run through the ditch. This project is the only one in the state which has attempted to pump water on a large scale. Quite an acreage was irrigated, but the operation of the pumping plant proved very costly.

The Mutual Irrigation and Water Power Company sold to the Central Irrigation and Water Power Company in November 1891. The latter company discarded the pumping plant and extended the ditch up the river through the "Bad Lands," making a gravity ditch. A notice of the change of the point of diversion was posted in Section 27, Township 22 north, Range 56 west, and a copy filed in the office of the county clerk of Scotts Bluff county on November 11, 1891. Construction was started and during the winter the canal was extended to a length of seven miles.

On April 26, 1901, a petition signed by four landowners was presented to the county commissioners of Scotts Bluff county, praying for the organization of an irrigation district, and on May 9, the commissioners approved the petition and called an election to be held on June 1. On June 10, the commissioners met as a canvassing board and finding a unanimous vote in favor of the district, declared the district duly organized. On August 27, bonds in the sum of $17,000 were voted for the purchase of the canal, and on March 15, 1902, bonds in the sum of $4,000 were voted for the purpose of installing structures along the canal. On October 15, 1910, the board of directors met to hear objections to issuing refunding bonds in the sum of $21,000 to take up all the older bonds. Refunding bonds were issued under date of January 1, 1911. On April 1, 1913, the district purchased for $12,275, a perpetual right to 4,800 acre-feet of stored water annually from the Pathfinder Reservoir.

For the purpose of levying assessments to meet maintenance and operation charges, and to cover bond issues and interest on bonds, the lands are assessed on a valuation of $10 to $30 per acre. For the year 1914, the maintenance and operation levy was 70 mills and that for the bonds 20 mills, making the charges for water per acre as follows:

Land Valuation	Operation and Maintenance	Bonds and Interest	Total
$10	$ .70	$ .70	$ .90
30	2.10	.60	2.70

The district embraces an area of 2,611 acres, practically all of which was irrigated in 1914.

MINATARE DITCH (D-919). During the year 1887 a public meeting was held at Minatare to discuss the question of building one large ditch to supply water to the entire valley. This proposition met with disfavor and the Minatare Canal Company was organized. On January 14, 1888, a notice of appropriation was posted on the north bank of the river in section 32, township 22 north, range 54 west, and construction was started shortly afterward. About eight miles of the ditch were completed and water was diverted and applied to the lands during the late summer of 1888. This was the first ditch in the upper valley of the North Platte river that actually diverted and used water upon the land. During the year 1889, the company extended the canal, completing high and low-line ditches. The length of each line is about nine miles. The system cost $26,500.

The Minatare Mutual Canal and Irrigation Company was incorporated with a capital stock of $25,000, and purchased the canal from the Minatare Canal and Irrigation Company on May 14, 1895.

There are 9,316 acres of irrigable land lying below this canal, and during the average year about 4,000 acres are irrigated. The crops grown are alfalfa, sugar beets, wild hay, wheat and potatoes. The average annual maintenance and operation charges are in the neighborhood of 75 cents per acre. There is quite a large acreage of seeped land lying below this ditch which is now being ditched and drained to make it more productive.

STEAMBOAT DITCH (A-186; A-350). The Steamboat Ditch Company was organized by the farmers as a mutual stock company. Each share in the company represents the water right for ten acres of land. The canal, which is six miles long and diverts the water from the river in Section 4, Township 21 north, Range 54 west, was built during May, 1896, at a cost of $2,500, and water was diverted and 300 acres were irrigated that season.

This company has been decreed a right to water for 830 acres by the district court of Scotts Bluff county, but of the acreage only 644 acres, planted to alfalfa, sugar beets and potatoes, were irrigated in 1914. The average annual maintenance and operation charges are 50 cents per acre.

CASTLE ROCK IRRIGATION DISTRICT (D-921). The Castle Rock Irrigation and Water Power Company was incorporated with a capital stock of $20,000 in April 1889, and during that month a notice of appropriation was posted on the south bank of the river in Section 4,

Township 21 north, Range 54 west. Construction was started the same summer and continued until the summer of 1896, by which time 17 miles of main canal and three miles of a low-line lateral had been completed at a cost of about $20,000.

On May 3, 1898, a petition signed by nine landowners was presented to the county commissioners of Scotts Bluff county, praying for the organization of an irrigation district, and on May 5, the commissioners approved the petition and called an election to be held on June 4. On June 13, the commissioners met as a canvassing board and finding 19 votes "yes" and 18 votes "no" declared the district duly organized. The district did not obtain possession of the canal until 1912. On September 14, 1912, a bond election was held, at which bonds in the sum of $30,000 were voted. These bonds were issued under date of October 1, 1912, and $20,500 worth were used to purchase the canal from the old company, and $6,801.96 worth to retire water rights of the old canal and repair and build lateral headgates, and $2,698.04 worth to pay for the construction of a headgate.

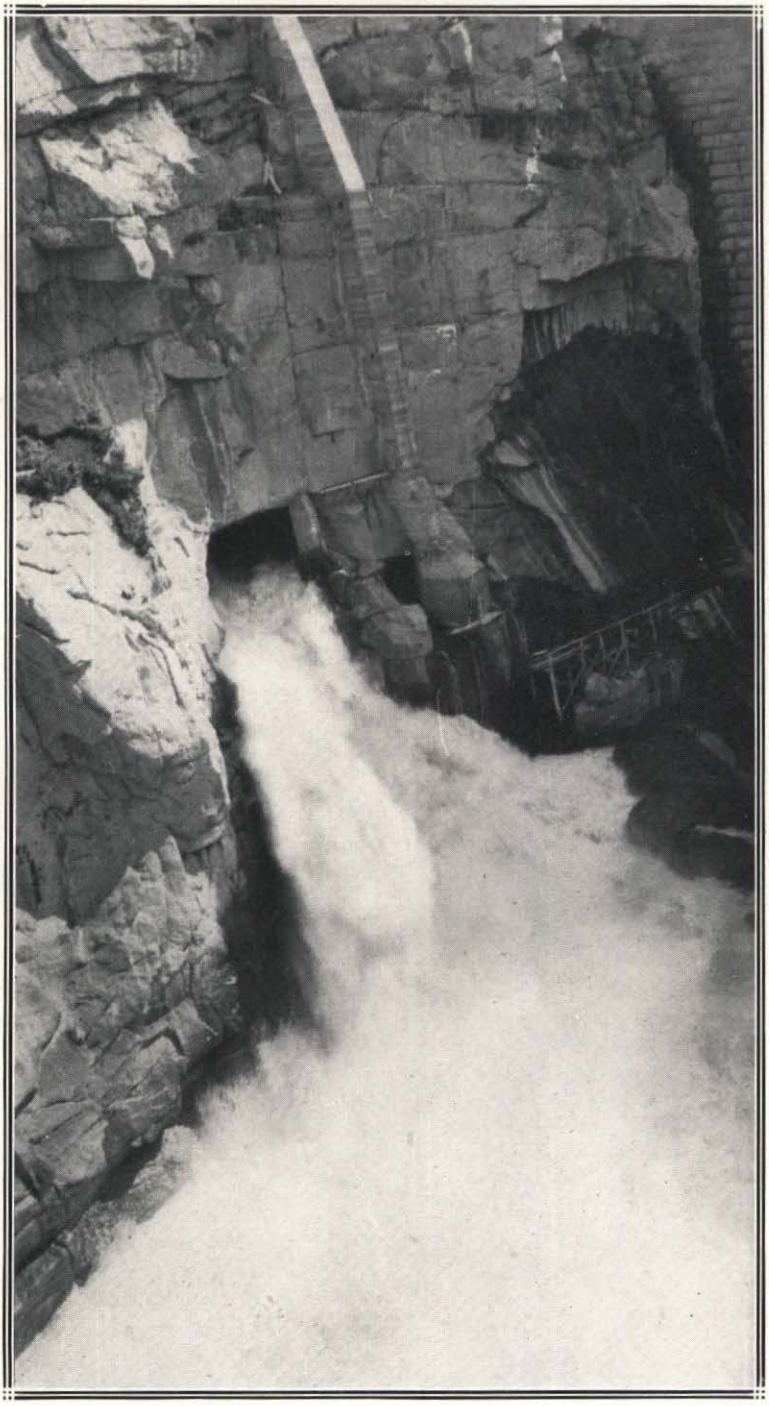
For the purpose of levying assessments to meet maintenance and operation charges, bond-sinking fund, and interest on bonds, the land is assessed on a valuation of $15 to $25 per acre. The levy for maintenance and operation for 1914 was 40 mills and that covering bonds was 15 mills, making the charge for water per acre as follows:

Land Valuation	Operation and Maintenance	Bonds and Interest	Total
$15	$ .60	$ .225	$ .825
25	1.00	.375	1.375

There are about 7,000 acres below this canal, but the district has been decreed a right for only 5,780 acres by the district court of Scotts Bluff county. The principal crops grown are alfalfa, sugar beets, potatoes, wild hay and grain.

NINE MILE CANAL (D-925). The Bayard Irrigation Canal and Water Power Company was incorporated during 1890, and on November 28, 1890, posted a notice of appropriation on the north bank of the river in Section 18, Township 21 north, Range 53 west, and started construction, but owing to financial difficulties, was forced to cease work during the summer of 1891. In August, 1893, the Nine Mile Canal and Reservoir Company was incorporated and purchased the rights of the Bayard Irrigation Canal and Water Power Company. It filed new notices of appropriation and completed the canal to a length of 21 miles at a cost of about $15,000, of which $1,500 was used in the construction of the headgates. The farmers were required to build their own laterals, but the company built the measuring boxes, the cost being charged to the irrigators.

On May 15, 1906, a petition signed by sixteen landowners was presented to the county commissioners of Scotts Bluff county, praying for the organization of an irrigation district, and on June 5, the commission-



ONE OF THE OUTLET TUNNELS, PATHFINDER RESERVOIR

ers approved the petition and called an election to be held July 17. On July 30, the commissioners met as a canvassing board and finding 31 "yes" votes and 5 "no," declared the district duly organized. On November 7, bonds in the sum of $18,000 were voted to take over the stock of the company at par. These bonds were issued under date of November 12. The district embraces an area of 6,328 acres, approximately all of which was irrigated in 1914.

For levying assessments to cover maintenance and operation, bond issues, and interest on bonds, the land is assessed on a valuation of $2.50 to $15 per acre. The levy in 1914 for maintenance and operation was 115 mills and that for bonds was 25 mills, making the charges for water per acre as follows:

Land Valuation	Operation and Maintenance	Bonds and Interest	Total
$ 2.50	$ .2875	$ .0625	$ .35
15.00	1.725	.375	2.10

A large portion of the acreage is in wild hay, but a narrow strip adjacent to the canal at the upper end and a considerable acreage at the lower end is in alfalfa, sugar beets, corn and small grains.

SHORT LINE CANAL (D-946). The Short Line Irrigation Company was organized as a stock company by the farmers and each share represented the water right for forty acres and had a par value of $100 The authorized capital stock of the company was $6,000. All the stock was worked out by farmers subscribing for it. Five miles of canal were built at a cost of about $6,000.

On April 15, 1912, a petition signed by eight landowners was presented to the county commissioners of Scotts Bluff county, praying for the organization of an irrigation district, and on July 12, the commissioners approved the petition and called an election to be held on August 10. On August 19, the commissioners met as a canvassing board and finding all nine votes cast in favor of the district, declared it duly organized. On April 18, 1914, bonds in the sum of $15,582 were voted, of which $9,700 were for the purchase of 97 shares of stock of the old company, $5,800 to be used in betterments, and $882 for paying the first year's interest. These bonds have not been issued, and while the district is practically operating the canal, no transfer has been made.

For the purpose of paying the maintenance and operating expenses during the year 1914, the land was assessed on a valuation of $15 and $20 per acre. The levy was 27 mills, making the charges for water per acre as follows: 40½ cents for the $15 land, and 54 cents for the $20 land.

The tax roll shows that the taxes have been levied on a basis of 2,537 acres, although the canal covers approximately 3,000 acres, practically all of which has been irrigated each year.

CHIMNEY ROCK CANAL (D-844). The Chimney Rock Irrigation Canal and Water Power Co. was incorporated under the laws of Nebraska.

In June, 1889, it posted a notice of appropriation on the south bank of the river in Section 6, Township 20 north, Range 52 west. Construction was begun soon afterward, and was continued until June, 1895. It was resumed in 1896, and the canal completed. At the lower end, the canal divides into a high-line and a low-line canal. The main canal, or high-line, is 13 miles long and the low-line four miles, making the total length 17 miles. The cost of building the system was $16,000.

Eighty-two shares, with a par value of $100 each, each representing the water right to 40 acres of land, were subscribed by farmers who had the privilege of making payment in work. Before the completion of the canal, it became necessary to assess this stock $100 per share.

On June 17, 1912, a petition signed by twelve landowners was presented to the county commissioners of Morrill county, praying for the organization of an irrigation district, and on October 3, the commissioners approved the petition and called an election to be held November 12. On November 22, the commissioners met as a canvassing board and finding all the 14 votes cast in favor of the district, declared it duly organized. On July 15, 1913, bonds in the sum of $83,000 were voted, of which $41,000 were for the purchase of the canal, $31,000 for taking up contracts of the old company with the U. S. Reclamation Service for stored water (6,580 acre-feet annually), $4,500 for taking up the accrued interest for the first year. The bonds were approved by the district court November 8, 1913. These bonds have not been issued, but the canal company and the district will hold a joint meeting in the near future for the purpose of trying to arrange for the transfer of the canal to the district.

For the purpose of levying an assessment to cover maintenance and operation, bond-sinking fund, and interest on bonds for the year 1914, the land has been assessed on valuations of $15 to $40 per acre. The levy for maintenance and operation is 13 mills and that for bonds, 32 mills. Although no bonds have been issued the cost of the water per acre is as follows:

Land Valuation	Operation and Maintenance	Bonds and Interest	Total
$15.00	$ .195	$ .48	$ .675
40.00	.52	1.28	1.80

There are about 7,000 acres under the ditch, but water rights for only 5,976 acres have been decreed to the company. This acreage is in alfalfa, sugar beets, corn and wild hay.

ALLIANCE CANAL (D-874). The Alliance Irrigating Canal and Water Power Company was incorporated in 1892. The articles of incorporation were amended in 1894. The capital stock was $10,000. On December 26, 1892, a notice of appropriation was posted on the north bank of the river in Section 5, Township 20 north, Range 53 West. The canal was built by the stockholders, who were allowed to work out their stock. Construction work was begun in 1893, and by July 1895, nine miles of the canal had been completed. During the following years the canal was

extended until at present it is fourteen miles long. The cost of construction was $12,000. Each irrigator built his own laterals and measuring box at the point of diversion from the main canal. The company has been decreed a right for 7,000 acres by the district court of Scotts Bluff county.

On October 28, 1912, a petition signed by twenty-one landowners was presented to the county commissioners of Morrill county, praying for the organization of an irrigation district, and an election was called for March 29, 1913. On April 7, the commissioners met as a canvassing board and declared the district duly organized. Bonds in the sum of $45,000 were voted for the purchase of the canal and to meet the accrued interest at the end of the first year. For the purpose of making assessments to meet maintenance and operating charges, bond-sinking fund, and interest on bonds, the lands are assessed on valuations of $4 to $15 per acre. For 1914, the levy for maintenance and operation was 41 mills and that for bonds was 55 mills, making the cost of water per acre as follows: Land valued at $4, 19.2 cents; and that valued at $20, $1.44.

BELMONT CANAL (D-828; A-902). The first agitation concerning this project was for the organization of a mutual enterprise. This movement was succeeded by the incorporation of the Belmont Canal and Water Power Company in 1889, with a capital stock of $450,000. It posted a notice of appropriation on the south bank of the river in Section 18, Township 20 north, Range 51 west, on December 19, 1889, and filed a copy with the county clerk of Cheyenne county, December 23. Con struction on the canal was started early in 1890, and continued until December 1892, during which time 41 miles of main canal had been completed. In the succeeding years a lateral system comprising about 110 miles of laterals was built. The total cost of construction of the irrigation system was $120,000.

Water was diverted in July, 1892. The maximum acreage irrigated was 18,500 acres in 1894, after which time the acreage irrigated gradually diminished, until in 1914 only 6,650 acres were irrigated. This is accounted for through a peculiar condition that existed under this project. The company was organized for the purpose of building the canal and selling water rights to the 27,320 acres lying below the canal. At first, water rights for 40 acres were placed on the market at $10 and $15 per acre. Rights for about 16,000 acres were contracted for under this plan, but the settlers under the canal, being mostly cattlemen instead of farmers, soon turned their attention almost entirely to stockraising and allowed many of the rights to lapse. This forced the company to buy in the land under the canal so that in future sales a water right could be attached to the land. The company floated a bond issue of $250,000 for this purpose. After the purchase of the lands the company operated them as a livestock company. At the present time they still own 9,000 acres and water rights for 7,000 acres are still held by private parties. The

price of water rights at the present time is $25 per acre. The company has been decreed a water right for 18,500 acres by the district court of Scotts Bluff county, which includes the 7,000 acres already sold. Lands holding a water right merely pay an assessment to the company. Water also is rented to non-water right holders at $1.50 per acre per annum.

This company has built several inverted concrete siphons, one across Pumpkin Seed creek, 300 feet long, with inside diameter of 5 feet, and another across Deep Holes creek, 325 feet long, with a 4-foot square opening.

At the present time there is a movement toward the organization of the land lying below the canal into an irrigation district.

BROWNS CREEK CANAL (D-857). The Browns Creek Canal Company was incorporated in 1891, with a capital stock of $20,000. A notice of appropriation was posted on the north bank of the river in Section 28, Township 20 north, Range 50 west, and a copy filed with the county clerk of Cheyenne county, on July 6, 1891. Construction of the canal was begun in August, 1891, and continued until 1895, at which time about 23 miles of canal had been completed at a cost of $22,000.

The company has been decreed a water right for 9,500 acres by the district court of Scotts Bluff county, but only 6,540 acres were irrigated during the season of 1914. No water rights were sold by the company, but water was rented annually at 75 cents per miner's inch. A miner's inch is fixed by the state law as 1-50 cubic foot per second.

No attempt was made to measure the water to the land, as the shortage during the dry months and the excessive seepage at the lower end of the canal make it impossible to apportion the water. Practically all of the land is in wild grass.

On September 16, 1912, a petition signed by twenty-seven landowners was presented to the county commissioners of Morrill county, praying for the organization of an irrigation district, and on the same date the commissioners approved the petition and called an election. The election was held and the district duly organized. The district has purchased a perpetual right to 19,900 acre-feet of stored water annually from the Pathfinder Reservoir at a cost of $61,900.

For the purpose of levying assessments for maintenance and operation charges, the land is valued at $35 and $40 per acre. For 1914, the levy for maintenance and operation was 21 mills, making the cost of water per acre, 73½ cents for the $35 land, and 84 cents for the $40 land.

LISCO CANAL (D-856; A-991) AND NORTH RIVER IRRIGATION CANAL AND WATER POWER COMPANY (A-243). These two enterprises are so closely related that it will be best to consider them together. In July, 1893, Reuben Lisco posted a notice of appropriation for 32.86 second-feet of water on the north bank of the river in Section 14, Township 18 north, Range 47 west, and built the Lisco canal, which was five miles long, for the purpose of irrigating his own lands. In 1896, the North River Irrigation Canal and Water Power Company was organ-

ized and made an application for a water right for 168.29 second-feet of water. This company proposed to irrigate a stretch of territory east of that watered from the Lisco ditch and desired to use the same right of way. A contract was entered into whereby the company enlarged the Lisco canal, and in return agreed to carry free of charge the water to which Lisco was entitled. The company was composed entirely of farmers, who worked out the stock subscribed for upon the following basis: The entire yardage to be removed was estimated, from which the number of yards to be moved for each 40-acre tract was determined. The farmers built 33 miles of canal, in addition to enlarging the five miles of the Lisco ditch during the years 1896-98. According to the yardage estimates made, it would have cost $33,000 to build the canal by contract.

The Lisco canal formerly covered 1,500 acres, and the completed canal brought an additional 12,000 acres under ditch. Water was used by the farmers in this larger area for several years, then dissensions over the use of the water arose and the ditch was allowed to deteriorate. It was not used after 1900, when a large break occurred in Sand draw that was never repaired.

When the company failed to keep the canal in repair, in accordance with the contract, Lisco was forced to keep the upper end in running order to supply water to his lands. He immediately brought an action and obtained a decree giving him his water right and the five miles of the canal on his former right of way. He then attached the canal of the company for the costs of the suit and took possession of the upper seven miles, thus making the Lisco canal twelve miles long instead of five miles.

In 1910 Lisco made an application for 3 second-feet additional, in order to cover all the lands below the canal. He then listed his own lands for sale, attaching a water right to each tract sold.

A mutual stock company with a capital stock of $20,000 has been organized and has taken over the management of the canal. There are about 2,800 acres under the ditch, and during the season of 1914 water was applied to 1,410 acres. The maintenance and operation charges have been very low, being only 25 cents per acre.

MIDLAND CANAL (D-789) AND OVERLAND CANAL (D-791). These two canals were built during 1894 and 1895 by individuals. Each cost about $2,000. The Midland has a length of 4½ miles and the Overland a length of 5 miles. The Overland heads below the Midland, but being built on a lighter grade it crosses over the Midland two miles below the headgates of that canal. The Overland canal was sold to the Westen Land and Cattle Company in 1905, and since that time the portion of the ditch lying below the Midland canal has been practically abandoned, the water being brought from the river through the upper portion of the Midland canal. This has practically combined the two ditches. About 2,240 acres are susceptible of irrigation from the combined canals, but only about 1,000 acres are irrigated annually, this being equally divided

between the two water rights. The cost of operations under the Midland canal was 10 cents per acre during the season of 1912, being one of the cheapest operated ditches on the river.

ORR AND VANCE DITCH (D-811). This is a partnership ditch, built during the period 1894-97, 2½ miles long, and cost $350. In 1901 a new point of diversion was located farther up the river and about three-fourths of a mile of new ditch was built at the upper end. Water is diverted from a narrow channel at a level below the bed of the river so that a water supply is available at all times. In 1902, an extension of one-half mile was built, making the total length about 3½ miles, and the total cost about $800. The ditch has approximately 235 acres under it, of which about 200 acres were irrigated during 1914 at a total cost of about $30, or 15 cents per acre.

ALFALFA IRRIGATION DISTRICT (D-738). A petition for the organization of an irrigation district was filed with the county commissioners of Keith county. It was approved May 4, 1895, and an election called for June 8. On June 17, the commissioners met as a canvassing board and declared the district duly organized. In March an application for 100 second-feet of water was made. A contract for the excavation of the canal was let at 8½ cents per cubic yard. Eighteen miles of canal were built in 1895, the contractor being paid in bonds. The district voted $22,000 in bonds and all were exchanged for construction work.

The district has an area of 6,169 acres, but as an irrigation enterprise it never has been a success. Water never has been carried the entire length of the canal and during the season of 1914 only ten miles of the canal were in operation, from which 1,440 acres were irrigated.

All the bonds are outstanding. Their validity was questioned, but it has been upheld by both the supreme court of Nebraska and the Circuit Court of Appeals of the United States.* No levy for interest or for bond fund has been made yet. For the purpose of levying the maintenance and operating charges, all land within the district is assessed on a valuation of $10 per acre. The maintenance and operation levy is 30 mills, making the cost of 30 cents per acre. The crops raised by irrigation are alfalfa, corn and wild grass.

KEITH AND LINCOLN COUNTIES IRRIGATION DISTRICT (D-722). In 1894 the Sutherland and Paxton Land and Irrigation Company was organized, and posted a notice of appropriation on the south bank of the river in Section 18, Township 14 north, Range 36 west. Twenty-eight miles of canal were built during the year 1894, at a cost of about $45,000. This ditch crosses the divide between the North Platte and the South Platte rivers, enters the South Platte valley just below the town of Sutherland, and swings westwardly.

Water was diverted in 1895, and has been used continuously ever since. Water rights were sold for $7 per acre on the North Platte drain-

*Rodgers v. Thomas, 193 Fed., 952; Orcott v. McGinty, 148 N. W., 586.

age slope and for $10 per acre on the South Platte drainage slope. The water contracts contained a clause whereby the company reserved the right to turn the canal over to the water right owners, at the end of ten years. All laterals were built by the farmers.

In 1905 the canal was turned over to the water right owners, who organized as the Keith and Lincoln Counties Irrigation Company, which operated the canal for one year. On October 4, 1905, a petition signed by forty-one landowners was presented to the county commissioners of Lincoln county, praying for an organization of an irrigation district, and on October 30 the commissioners approved the petition and called an election to be held December 2. On December 11 the commissioners met as a canvassing board and finding 39 votes "yes" and 14 votes "no," declared the district duly organized.

On March 1, 1906, the district voted bonds in the sum of $65,000, of which $49,000 was paid to the company, who in turn cancelled all water contracts and turned the canal over free from debt. The other $16,000 was expended in betterments and improvements of the irrigation system. This district has an area of 8,360 acres.

The land, for district purposes, is assessed on a valuation of $20 per acre. For 1914 the levy for maintenance and operation is 50 mills and that for interest on bonds and bond-sinking fund, and interest, 34 mills, thus making the cost of water $1 per acre for maintenance and operation, and 68 cents for bonds.

During the season of 1914 about 6,450 acres were irrigated. The principal crops grown are alfalfa, wheat, corn and other small grains. The Hunter orchard of about 40 acres, described on page 61, is located under this canal, and demonstrates what can be done in the way of raising fruit.

SOUTH SIDE IRRIGATION AND LAND COMPANY CANAL (D-667). This canal had its beginning in the latter part of the eighties, at which time it was proposed to build a canal from the South Platte river upon almost the same line that later was occupied.

Early in 1894 an enterprise was promoted for the purpose of diverting water from the North Platte river to irrigate lands to the south side of the South Platte river just south of the town of North Platte. The first plan of this enterprise would have left a large acreage southwest of the town of North Platte and south of the South Platte river above the canal. After investigation, it was found to be feasible to locate the canal between the rivers farther west at a higher elevation, and a notice of appropriation was posted on the south bank of the North Platte river. This right afterwards was transferred to the company.

The South Side Irrigation and Land Company, with a capital stock of $75,000, was organized on June 17, 1894. Very few contracts for construction were let, almost all the work being done by the farmers themselves. They either were allowed a certain wage per day or were given credit for the number of yards excavated. With the exception of some

few cases where money had to be advanced to supply the necessities or for feed for teams, all work was paid for in stock of the company at a rate of 5 cents per cubic yard. Where cash was advanced, only four cents per cubic yard was paid.

A contract was let for the construction of 6¾ miles of canal lying between the two rivers, payment to be made in stock of the company. The contractors furnished bond for $20,000 to guarantee the completion of the work and the company agreed to furnish the right of way. The work was begun simultaneously at the banks of the South Platte river, the farmers working down the canal on the south side of the river, and the contractors working up the canal between the rivers. The company became involved in litigation over some right of way between the rivers, and the contractors ceased work after two miles of canal had been completed. The winter of 1894-95 was an open one and the farmers worked throughout the entire winter. During the years 1894-95, 41 miles of canal were completed.

As no stock was sold for cash, the landowners formed an improvement district and voted $10,000 in improvement bonds to pay for the material used in the construction of an inverted siphon across the South Platte river. This structure was a double box section, containing over 250,000 feet B. M., of lumber, and cost $12,000. The total cost of the canal was $85,000.

Water was run through the entire length of the canal for several years. Better weather conditions and dissatisfaction among the water users because of the non-delivery of water, led many either to sell their landholdings or quit using water, and resulted in the canal falling into disuse, and no water being carried south of the river for some 12 or 14 years. The abandoned canal was sold under foreclosure to satisfy a debt of $5,000, and no further attempt was made to operate it. More than 25,000 acres lie below the canal, the greater portion of the land being located upon the second bench.

PLATTE VALLEY IRRIGATION DISTRICT (D-635). An attempt was made at North Platte during the early eighties to promote an irrigation enterprise at that point. On January 11, 1883, a company was organized with a capital stock of $100,000, but nothing accomplished. On May 14, 1883, the North Platte Irrigation and Land Company was organized with a capital stock of $160,000. In the meantime, part of the incorporators had purchased from the Union Pacific railroad 6,321.27 acres of land. On July 1, 1884, these lands were sold to the company for $40,000. During the years 1883-84, 25 miles of canal were built through the above-mentioned lands, and on October 15, 1884, the east half of the canal was transferred to the company for $40,000. Some of the incorporators purchased 7,321.89 more acres from the Union Pacific Railroad Company, and on January 13, 1886, these lands were transferred to the company for $40,000.

The canal was built with the intention of watering all the land,

DIVERSION DAM OF OLD NORTH PLATTE CANAL AND COLONIZATION COMPANY AT SITE OF PRESENT WHALEN DIVERSION DAM, U. S. R. S.

some 25,000 acres, lying between the canal and the river. At first water rights were sold for $6 per acre, but later the price was raised to $12.50 per acre. During the first years the canal was in operation the people did not share the enthusiasm of the promoters, and not many water rights were sold. The canal was not used for irrigation to any extent until about 1890, the beginning of the series of dry years which followed. During the next few years there was much dissatisfaction regarding the delivery of water, and many farmers having lands located between the canal and the river filed notices of appropriation and constructed other canals below the North Platte Canal, thus reducing the average tributary to that canal.

On January 26, 1892, the North Platte Irrigation and Land Company transferred all its holdings, consisting of 4,483 acres, and the canal, to the North Platte Land and Water Company, a foreign corporation for $338,000. This company immediately placed a mortgage of $150,000 upon the canal. On February 1, 1892, five days later, the canal subject to this mortgage, was transferred back to the North Platte Irrigation and Land Company, and after that date the canal and lands were handled by two distinct companies. For ten or twelve years after 1894 the system was successfully operated.

On June 12, 1911, the canal was transferred to a receiver. On August 31, 1911, a petition signed by thirty-three landowners was filed with the county commissioners of Lincoln county, praying for the organization of an irrigation district. On October 24, the commissioners approved the petition, and called an election for December 2. On December 11, the commissioners met as a canvassing board and finding 33 votes "yes," and 6 votes "no," declared the district duly organized, with an area of 11,262.58 acres. The area included has been increased since to 11,375 acres. Upon an order of the court the receiver of the North Platte Irrigation and Land Company transferred the canal to the Platte Valley Irrigation District on February 6, 1912. No bonds were issued for its purchase, as the district embraced the lands for which water rights had been sold by the company.

The district is now building a diversion dam and headgate, for which it expects to pay without a bond issue. For the purpose of levying taxes to cover maintenance and operation, all lands within the district are assessed on a valuation of $25 per acre. The levy for 1914 was 40 mills, making the cost of water $1 per acre.

About 11,000 acres within the district were irrigated during the season of 1914. The district is given over to general farming, alfalfa being the chief crop. Some wild hay lands are located along the upper portion of the canal.

This canal was the first large canal built within the state and during the later years has been successfully operated.

PAXTON AND HERSHEY CANAL (D-653). The Paxton and Hershey Irrigating Canal and Land Company was organized July 16,

1894, with a capital stock of $100,000. A notice of appropriation had been posted on February 13, 1894, on the south bank of the river in Section 18, Township 14 north, Range 33 west. This right afterwards was transferred to the company. On July 21, 1894, land holdings of the chief incorporators were transferred to the company for $100,000 and on October 12, 1896, the company acquired an additional 1,053.3 acres at a cost of $30,985.80. The company constructed ten miles of canal during the year 1894, at a cost of $15,000. All land sold had a water right attached, and the contracts contained a clause stating that the canal would be turned over to the water users within a specified time. In 1907, the water users organized into a mutual stock company and took over the management of the canal.

There are 7,833 acres below the canal, and during 1914, 7,300 acres were irrigated. The maintenance and operation charges are low, being 30 cents per acre. The land is given over to general farming, alfalfa and wild hay being the chief crops.

THE SUBURBAN IRRIGATION DISTRICT (D-662). A notice of appropriation was posted on the south bank of the river in Section 12, Township 14 north, Range 33 West, on May 22, 1894, and on May 24, 1894, the Farmers and Merchants Irrigation and Land Company was organized with a capital stock of $50,000. On July 20, 1894, the articles of incorporation were amended, changing the capital stock to $25,000. This company proposed to build a canal to cover all the lands lying in the delta around and below the town of North Platte and during the years 1894-95, 18 miles of canal were built at a cost of $25,000.

On January 28, 1896, a petition was filed with the county commissioners of Lincoln county, praying for the organization of an irrigation district, and on March 16, the commissioners approved the petition, and called an election for April 10. On April 20, the commissioners met as a canvassing board, and finding ten votes "yes" and one "no," declared the district duly organized. The district voted bonds in the sum of $26,000 for the purchase of the canal. The area of the district is 6,920 acres, of which about 5,000 acres were irrigated in 1914.

The land for irrigation district purposes is assessed on a valuation of $10 per acre. The maintenance and operation levy for 1914 was 39 mills, and that for bonds was 48 mills, making the cost per acre 39 cents for maintenance and 48 cents for sinking fund and interest, a total of 87 cents.

The principal crops raised are alfalfa, wild hay, and small garins. The enterprise has been very successful under the district organization.

CODY AND DILLON CANAL (D-649). The Cody and Dillon Irrigation Canal Company, a partnership, on December 29, 1893, posted a notice of appropriation on the south bank of the river in Section 9, Township 13 north, Range 31 west, and during the year 1894 built 13 miles of canal at a cost of $10,000 to irrigate its own lands. For some years

only nine miles of the canal have been in operation. There are 3,640 acres under this portion of the canal, of which 2,560 acres were irrigated in 1912. The maintenance charges are very light.

The following table shows the status of the canals from the North Platte river:

STATUS OF CANALS ALONG THE NORTH PLATTE RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O.		
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	1914	
Interstate Canal	A 768	1906-14	131.	$6381050.00	1914	131.	107530	48208	91484	$ 1.25	$ 1.10	U. S. R. S.
French Ditch	A1149	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Mitchell Ditch	.....	1890 91	28.	56100.00	1914	28.	16800	13717	.....	*1.35	*1.50	Irrigation District
Gering Canal	A 365	1898-00	25.	177000.00	1914	25.	15281	9000	15281	*2.50	*2.00	Irrigation District
Farmers Canal	D 918	1888-10	73.	2500000.00	1914	73.	65000	25000	37756	.35	*4.50	Irrigation District
Columbia Canal	A 660	d-D918	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Rooster Canal	D 950	1897-	1.	166.00	1900	.....	.....	.....	.....	.....	.....	
Ramshorn Canal	D 945	1893-94	6.5	6250.00	1914	6.5	2542	480	2520	.35	.....	Mutual Stock Co.
Enterprise Ditch	D 920	1888-95	24.	31306.00	1914	24.	7275	5080	7274	*2.00	*2.00	Irrigation District
Winter Creek Canal	D 952	1888-90	12.	10700.00	1914	12.	5840	4800	5608	2.50	.....	Corporation
Homestead Ditch	D 941	1893	0.5	635.00	1897	.....	.....	.....	.....	.....	.....	
Central I. and P. Canal	D 926	1890-91	7.	15000.00	1914	7.	2611	2537	2611	*1.80	*2.70	Irrigation District
Minatare Ditch	D 919	1888-89	18.	26500.00	1914	18.	9316	4000	9316	.75	.....	Mutual Stock Co.
Round House Rock Canal	A 992†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Steamboat Ditch	A 186	1896	6.	2500.00	1914	6.	830	830	644	.50	.....	Mutual Stock Co.
Steamboat Ditch	A 350†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	d-A186
Castle Rock Canal	D 921	1889-96	20.	20000.00	1914	20.	7080	5780	6497	.50	*1.37	Irrigation District
Liebhardt Canal	A1165	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	d-D921
Kah Ditch	D 944	1890	1.5	500.00	1914	1.5	360	360	349	.....	.....	Private
Nine Mile Canal	D 925	1890-93	21.	15000.00	1914	21.	6328	4500	6328	*2.00	*2.00	Irrigation District
Short Line Canal	D 946	1893	5.	6000.00	1914	5.	3000	3000	3023	.50	.54	Irrigation District
Chimney Rock Canal	D 844	1889-96	17.	16000.00	1914	17.	7000	5967	.....	.....	*1.80	Irrigation District
Chimney Rock Canal	D1031†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	d-D884
Alliance Canal	D 874	1893-96	14.	12000.00	1914	14.	8200	5000	6280	.80	*1.44	Irrigation District
Alliance Canal	D1035†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	d-D874
Dobson Lateral	A1181	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	d-D874
Belmont Canal	D 828	1890-92	41.	120000.00	1914	41.	27320	4120	6646	.....	1.50	Corporation
Belmont Canal	A 902	d-D828	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Empire Canal	D 858	1891	6.	3500.00	1914	6.	2280	2000	2280	.50	.....	Mutual Stock Co.
Empire Canal	A 866	d-D858	.....	.....	.....	.....	.....	.....	.....	.....	.....	

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O.		
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	1914	
Schemmerhorn Canal	A 418	1897	7.	5000.00	1914	7.	2400	2000	2080	.15	.....	Mutual Stock Co.
H. T. Clark Canal	D 875	1893	3.	1500.00	1907	.....	600	.....	.....	.....	.....	
Logan	D 821	1889-90	1.5	.....	1914	1.5	480	150	175	.....	.....	Mutual Stock Co.
Browns Creek Canal	D 857	1891-95	23.	22000.00	1914	23.	6540	3600	6540	.75	* .84	Irrigation District
Browns Creek Canal	D1033†	d-D857	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Tetreault Ditch No. 2	A 353	.....	2.	.....	c	.....	.....	.....	.....	.....	.....	
Beerline Canal	D 887	1894	7.	10000.00	1914	7.	2040	680	2040	.....	.....	Mutual Stock Co.
La More Ditch	A 327	1896	5.	.....	1914	5.	1620	700	535	.25	.....	Partnership
Lisco Canal	D 856	1893	5.	.....	.....	.....	1500	.....	.....	.....	.....	
N. R. I. C. & W. P. Co.	A 243	1896-98	33.	33000.00	1900	.....	12000	.....	.....	.....	.....	
Lisco Canal	A 991	.....	.....	.....	1914	12.	(1)	1278	2412	.25	.....	Mutual Stock Co.
Hannah Irrigation Canal	D 886	1894	3.	1500.00	1910	.....	400	.....	.....	.....	.....	
Rush Creek Irrigation Canal	D 802	1895	3.5	1000.00	1914	2.	1020	100	676	.....	.....	Mutual Stock Co.
Bower Ditch	D 787	1895-95	4.5	2262.00	1906	.....	1640	.....	301	.....	.....	
Spohn Ditch	D 801	1895	2.	4500.00	1914	2.	900	800	868	.....	.....	Private
Lyons Irrigation Canal	D 803	1894	5.	2170.00	1902	.....	2890	.....	.....	.....	.....	
Oshkosh Canal	D 797	1892	4.3	3000.00	1914	4.3	2800	1450	1295	.35	.....	Mutual Stock Co.
Gyger Ditch	D 806	1895	1.5	400.00	1903	.....	400	.....	.....	.....	.....	
Midland Ditch	D 789	1894-95	4.5	2000.00	1914	4.5	860	500	860	.10	.....	Private
Overland Irrigation Co. Canal	D 791	1894-95	5.	2000.00	1914	4.	1400	500	1050	.10	.....	Private
Bushnell Bros. Ditch	D 809	1895	2.	230.00	1907	.....	500	.....	.....	.....	.....	
Signal Bluff Ditch	D 807	1895-11	4.5	5000.00	1914	4.5	2100	1438	.....	.....	.....	Partnership
Orr and Vance Ditch	D 811	1894-97	3.5	800.00	1914	3.5	240	205	210	.15	.....	Partnership
Robbins and Williams Ditch	D 804	1895	6.5	745.00	s	.....	2000	.....	.....	.....	.....	
Alfalfa Irrigation Dist. C	D 738	1895	18.	22000.00	1914	10.	6169	1400	4050	.30	.30	Irrigation District
Holcomb Ditch	A 1	1895-98	4.	4000.00	1914	3.	2000	160	.....	.....	.....	Private
Hayland Canal	D 732	1894	1.5	300.00	1909	.....	300	.....	.....	.....	.....	
Meyers & Phelps C	D 709	1892	3.5	1700.00	1914	2.7	600	180	.....	.....	.....	
Fernstrom & Nissen	D 737	1895	3.	1500.00	1911	.....	812	.....	812	.....	.....	
S. & P. L. and Irr. Canal	D 722	1894	28.	45000.00	1914	28.	8360	6300	6447	1.68	1.68	Irrigation District

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O.		
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	1914	
Sheridan & Wilson	D 710	1892-93	3.5	1250.00	1908	.....	700	.....	.....	.....	.....	
South Side I. and L. C. C	D 667	1894-95	41.	85000.00	1900	.....	25600	.....	.....	.....	.....	
North Platte Canal	D 635	1883-84	25.	60000.00	1914	25.	12654	9680	12654	.92	1.00	Irrigation District
Paxton & Hershey C	D 653	1894	10.	15000.00	1914	10.	7833	3480	7833	.35	.....	Mutual Stock Co.
Farmers & Merchants	D 662	1894	18.	25000.00	1914	25.	6920	4320	.....	.87	.87	Irrigation District
Dikeman Canal	D 684	1895	1.7	950.00	c	.....	1000	.....	.....	.....	.....	
Cody & Dillon	D 649	1894	13.	10000.00	1914	9.	3640	2500	.....	.....	.....	Private
Hubbard & Hall	D 691	1896	5.	2000.00	1900	.....	2000	.....	.....	.....	.....	
Keith Canal	D 657	1895-96	10.	.....	c	.....	2000	.....	.....	.....	.....	
Smith Canal	D 676	1895	4.	2000.00	c	.....	1400	.....	.....	.....	.....	
Totals	.....	.....	783.0	$9773014.00	.....	649.0	420911	185800	254735	.....	.....	

* Highest charge: i. e., charge on highest priced land.
(1) 2800 acres lie below the canal as now operated.
d- An additional water right for ditch (number).
† Water right pending.
c Ditch not used for years.
s No water ever diverted.
✦ Maintenance and Operation.

CANALS ALONG PUMPKIN SEED CREEK

Owing to the small water supply of the creek the irrigated lands lie in a very narrow strip adjacent to the stream, and most of the canals are small. The first irrigation was attempted in 1879, when the Bay State Cattle Company built a ditch which was used for years to irrigate wildhay lands. In 1882, J. S. Wright built a ditch and began to divert the water from the creek. Then in 1887 three ditches were built along the creek, and about this same time the Laing ditch was built on the headwaters of Lawrence Fork, a tributary of Pumpkin Seed creek. The practice of irrigation was undertaken in earnest during the dry years of 1891-1895, and it was during this period that the greater number of ditches were built.

There are thirty-three existing appropriations from the creek, with a total appropriation of 117.32 second-feet. Five of the appropriations never have been used; three either have been abandoned or have not been used for years; no construction has been done on three; one is used merely to create a lake; and three are merely additional rights to existing canals. No information could be obtained concerning two.

Twenty-four ditches have been built along the creek, of which nineteen were in operation in 1914, and of this number, nine were operated as private ditches, six by partnership, and two by mutual stock companies. Data regarding the ownership of two could not be obtained.

There is always a shortage of water in the creek during the growing season, but during 1914 the flow was exceedingly short, as little rain fell after May. Of the 46.6 miles of ditch built 38½ miles were in operation during 1914, and capable of supplying water to 7,571 acres. The principal crops grown by irrigation are alfalfa, wild hay and grain.

Alfalfa can be cut three times during the season.

This valley has no railway facilities and all produce grown is usually fed to stock.

The flows of the tributaries of Pumpkin Seed creek are all appropriated, and there are shortages of water during the growing months. There are twenty-four existing appropriations within the basin besides those upon Pumpkin Seed creek. Five of these either have never been used at all or have not been used for a period of years and three are for extensions to existing canals, no construction was done on one, and no information could be obtained regarding three. Eighteen ditches, with a total of 20.6 miles have been built, and 17 ditches with a mileage of 18.6 miles and capable of irrigating 2,790 acres were in operation during 1914.

Thus within the drainage basin of the Pumpkin Seed creek 42 ditches have been built and 36, capable of covering 10,361 acres, were in operation during 1914.

AIREDALE CANALS Nos. 1 AND 2 (A698-699). The application for the water right was made in 1903. Work was begun on Canal No. 1 in 1905 and completed in 1908, two miles of main ditch and about two

miles of laterals having been built. Canal No. 2 was begun about the same time, but was not completed until 1911. Concrete dams and headgates have been built and concrete measuring weirs installed in both ditches. The cost of construction for each ditch has been about $1,500. Each ditch covers about 500 acres, of which 290 acres under ditch No. 1 and 320 acres under ditch No. 2 were irrigated in 1914. The land is mostly in alfalfa, with some wild hay and small grains.

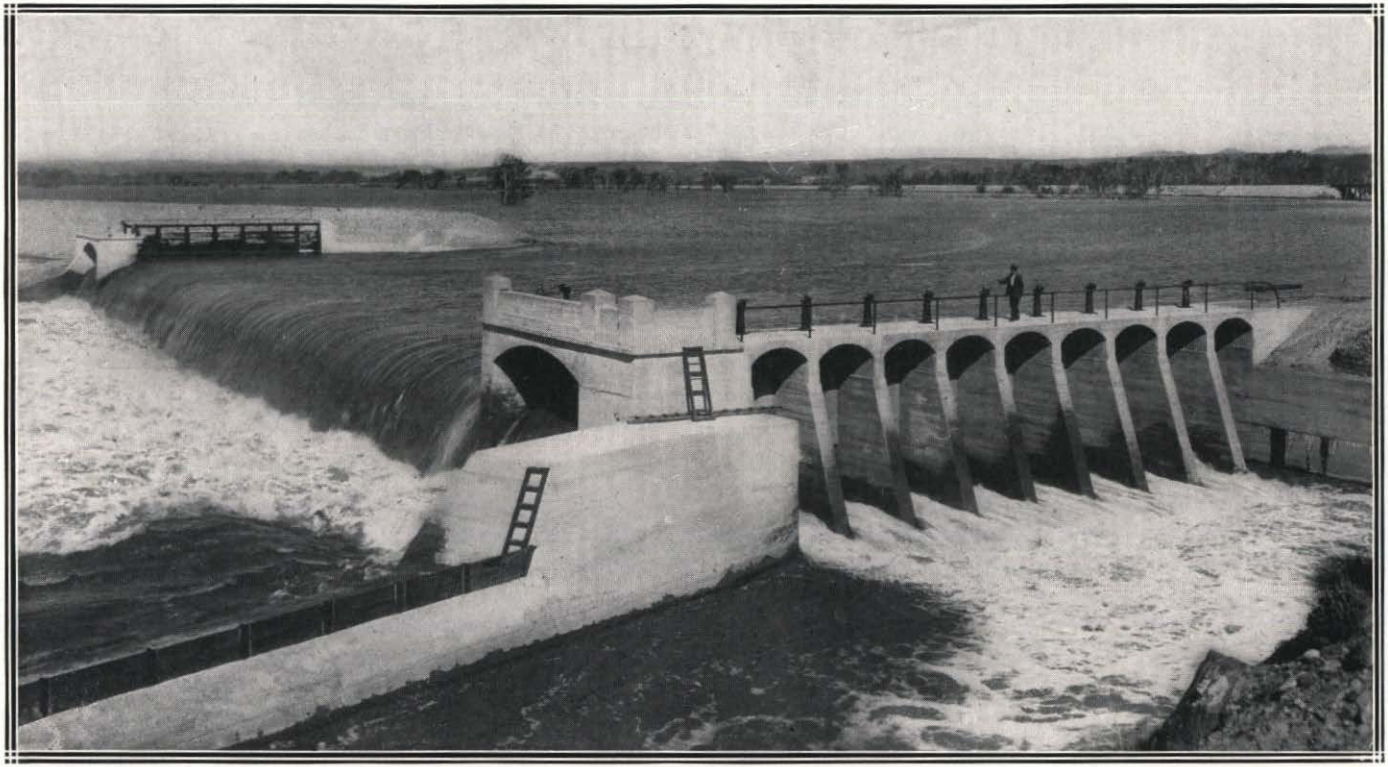
MUTUAL DITCH (D-843). The Mutual Ditch Company was incorporated with a capital stock of $10,000, each share representing a water right to forty acres and having a par value of $100. Only ten shares were subscribed for, and at the present time these are held by seven parties. Four miles of ditch were built during 1891 at a cost of $2,140. There are 800 acres under the ditch, of which 160 acres were irrigated in 1914. The average annual cost of operating and maintaining the ditch is $100, or 62½ cents per acre. New headgates were built in 1912 at a cost of $250.

BIRDCAGE DITCH (D-892.) The Birdcage ditch was built in 1895 and is about two miles in length. The old ditch was on the north side of the creek, but a new ditch has been built on the south side with a flume across to the same ground. The cost of construction was about $600. This ditch is owned by three parties in partnership, and covers 140 acres, of which 60 acres were irrigated in 1912, at a total cost of $50. The land is in alfalfa and wild hay.

ROUND HOUSE ROCK DITCH (D-884). This ditch is two miles long, and was built in 1894-95, at a cost of $1,000. It is owned in partnership by three partners, who hold three-eighths, three-eighths, and one-fourth interest, respectively. Three hundred acres lie blow this ditch and 160 acres were irrigated in 1914. The cost of operation and maintenance is $75 per year. Alfalfa and wild hay are grown.

COURT HOUSE ROCK IRRIGATION CANAL (D-840). The Court House Rock Irrigation Canal Company was organized with a capital stock of $6,000. Each share represents a water right to 40 acres and has a par value of $100. Only thirty shares were subscribed, and these have been increased in value to between $200 and $250, each. In 1891-92, the company built five miles of canal at a cost of $4,050. There are 3,000 acres below the canal, of which 2,000 acres were irrigated during 1912. The cost of maintenance and operation for 1912 was $8 per share, or 20 cents per acre. About 1,000 acres are planted to alfalfa and the balance is mostly in small grains.

LAST CHANCE DITCH (D-883). This is a partnership ditch, built in 1896. The system consists of three miles of canal, and a double row sheet-piling dam across the creek, the cost being $3,500. There are 900 acres under the ditch, about 500 acres of which are usually irrigated each year at a cost of about 20 cents per acre. The acreage is about equally divided between alfalfa, wild hay, and general farming.



DIVERSION DAM AND INTAKE GATES, NORTH PLATTE PROJECT, U. S. R. S., WHALEN, WYOMING

MEREDITH AND AMMER DITCH (D-876). The Meredith and Ammer ditch was built in 1893. The system consists of two ditches, one on either side of the creek, diverting water at the same dam. The ditch on the west side is two miles long and the one on the east side is 2½ miles long. At present the ditch is owned by a partnership of four equal shares. Eight hundred acres were irrigated from this canal in 1912 at a total cost of $100, or 12½ cents per share.

The following table shows the status of the canals along Pumpkin Seed creek and its tributaries:

STATUS OF CANALS ALONG PUMPKIN SEED CREEK

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Hampton Ditch	D 906	†	1.				160			$	
Clearfield Canal	A 888	†									
Peters Ditch	D 913*	1894	2.	$ 205.00	1914	2.	100	100	180	.10	Private
Reservoirs 1, 2 and 3	A 711	1904	0.7	1200.00	1914	0.7	100	90	91	.20	Private
Logan Ditch	D 902	1891	1.	300.00	1914	1.	240	190			Private
Beatty Canal	A 836	o									
Beatty Canal	A1004										Began and abandoned
Theo. Johnson Ditch	A 819	o									
Airedale Canal No. 1	A 698	1905	2.	1500.00	1914	2.	300	250	292	.20	Private
Airedale Canal No. 1	A1380										d-A 698
Airedale Canal No. 2	A 699	1906	3.	1500.00	1914	3.	400	300	330	.20	Private
Airedale Canal No. 2	A1133										d-A 699
Kelley Ditch	D 915	1888	0.5	168.00	c		100				
J. S. Wright D. No. 2	D 905	1887	2.	205.00	1914	2.	250	200			
J. S. Wright D. No. 1	D 904	1882	2.5	321.00	1914	0.8	320	100			
Heard's Ditches 1 and 2	D 916	1887	1.4		1914	1.	100	10			Private
Endered Ditch	D 903	1891	1.	120.00	1914	0.5	70	10			Private
Abbott & Wisner Ditch	D 917*		2.5	265.00	1914	2.5	200	125			Partnership
Smith Ditch	A 722	1903									Used as fish pond
Waitman's Ditch	D 847	1891	2.	950.00	1900		200				
Mutual Ditch	D 843	1891	4.	2140.00	1914	4.	800	300	160	.38	Mutual Stock Co.
Seeley Irrigation Ditch	A1052	o									
J. J. Maxwell Irrigation Ditch	D 885	1894	2.	500.00	1900		60				
Birdcage Ditch	D 892	1895	2.	600.00	1914	2.	140	60		.85	Partnership
Round House Rock D	D 884	1894	2.	1000.00	1914	2.	300	160	160	.45	Partnership
Smith & Wheeler	D 842	1896	1.	200.00	1914	1.	111	50	111		Private
Dunlap Ditch	D 889	1895	0.5	60.00	1914	0.5	40	15	30	1.00	Private
Wm. M. Willard Ditch	D 888	1895	1.	200.00	1914	1.	100	40		.65	Partnership
Court House Rock D	D 840	1891	5.	4050.00	1914	5.	2100	1000	1420	.20	Mutual Stock Co.
Court House Rock D	D1028*										d-D 840

STATUS OF CANALS ALONG PUMPKIN SEED CREEK—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Swanger Ditch	A 851	o	.....	.....	.....	.....	.....	.....	.....	.....	
Last Chance	D 883	1896	3.	3500.00	1914	3.	900	700	530	.20	Partnership
Meredith & Ammer Ditch	D 876	1893	4.5	.....	1914	4.5	1000	800	.....	.13	Partnership
Totals	.....	.....	46.6	$ 18984.00	.....	38.5	8091	4500	3304	.....	

ǂ No further information available.
c Ditch not used for years.
* Water right pending.
d- An additional water right for ditch (number).
o No construction work.
✦ Mainteuance and Operation.

STATUS OF CANALS ALONG TRIBUTARIES OF PUMPKIN SEED CREEK

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
HUNTINGTON SPRINGS											
Cord Ditch	A 778	†			1914				40		
WILLOW CREEK											
Willow Spring Ditch 1	A 650	1901	1.2	$ 500.00	1914	1.2	160		160		
Willow Spring Ditch 2	A 651	1901	1.2	500.00	1914	1.2	60		50		
	Totals		2.4	$ 1000.00		2.4	220		210		
LAWRENCE CREEK											
Laing Ditch	D 825	1887	0.3	$ 80.00	1914	0.3	40	15		$ 1.00	Private ,
Randoll Brothers	A 1100	1889	1.5	150.00	1914	1.5	200	60	167		Private
Doran Ditch	D 850	1894	1.	375.00	1914	1.0	80		55		
Bicket Ditch	A 670	1905	0.5	100.00	1914	0.5	80	30	80		Private
Niehus Ditch	A 550	1900	0.5	100.00	1914	0.5	70	60	65		Private
Harper Ditch	A 669	1902	0.5	200.00	1914	0.5	160	100	160		Private
Spring Branch Ditch	D 862	1891	1.	250.00	1914	1.	240	100	240		Private
Spring Branch Ditch	A 476										d-D 862
H. V. Redington Ditch	D 893	1893	0.3	50.00	1914	0.3	35	35			Private
E. S. Crigler Ditch	D 861	1891	1.5	200.00	1914	1.5	320	50	140	$ 1.00	Private
Crigler Extension	A 486										d- D861
Redington Ditch	D 820	1890	1.	130.00	e						Obliterated
	Totals		8.1	$ 1635.00		7.1	1225	450	907		
GREENWOOD CREEK											
Nelson Canal	D 845	1893	2.2	$ 1720.00	1914	2.2	240	100			Private
Trinnier Canal	D 849	1892	2.5	1000.00	1914	2.5	510	200			Private
Coulter Canal	D 830	1890	2.	750.00	1914	1.	285				Merely ran water in 1912
Capron & Lamb	D 890	1893	1.7	550.00	1914	1.7	150	140	150		Private

STATUS OF CANALS ALONG TRIBUTARIES OF PUMPKIN SEED CREEK—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O.	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	
Dean Ditch	A 844	o	.....	.....	.....	.....	.....	.....	.....	.....	
Meglemre Ditch	A 294	1895	1.7	1200.00	1914	1.7	160	30	160	.....	Private
Meglemre Extension	A 853	.....	.....	.....	.....	.....	.....	.....	.....	.....	e-A 294
North Robinson Dean	A 1045	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Totals	.....	10.1	$ 5220.00	.....	9.1	1345	470	310		
SPRING BRANCH											
Harper Ditch No. 2	A 674	†	.....	.....	.....	.....	.....	.....	.....	.....	

† No further information available.
c Ditch not used for years.
e An extension to ditch (number).
d- An additional water right for ditch (number).
o No construction work done.
✦ Maintenance and Operation.

CANALS ALONG BLUE CREEK

With the exception of Blue, White Tail and Birdwood creeks the flow of the other tributaries are small and, with the possible exception of Birdwood creek, the flow of each has been over-appropriated and there is not sufficient flow to supply the demand. The crops raised by irrigation are alfalfa, wild hay, and some general farming on a small scale. The value of irrigated lands located upon these tributaries depends upon the improvements and the distance from market.

Only a few of the canals along this creek will be given special mention.

PAISLEY IRRIGATION DISTRICT (A-515). A notice of appropriation was posted on November 20, 1894, and some time following, about five miles of canal were built. In 1898, the Paisley Irrigation District was organized and an application for an additional water right of 4 second-feet was made on September 13, 1898, but the state board of irrigation dated the priority as of July 14, 1899. The district took over the canal and extended it about a mile, making a total length of approximately six miles. The district comprises an area of about 1,500 acres, of which 800 acres are irrigated annually. The district at one time voted $1,300 in bonds but only $900 were issued.

BLUE CREEK IRRIGATION DISTRICT (D-785). A notice of appropriation posted December 27, 1893, was acquired by a company who constructed the Blue Creek ditch. The ditch was 12½ miles long and cost $5,000. The landowners under the ditch organized the Blue Creek Irrigation District and voted bonds in the sum of $10,000, which was paid to the company for the ditch, the company cancelling all water rights previously sold. The district has an area of 3,170.6 acres, of which about 2,790 acres are irrigated annually.

GRAFF CANAL (D-788). A notice of appropriation was posted in 1894 and during 1894-95, eight miles of canal were built at a cost of $5,000. In 1901, one partner purchased the interest of the other partner and in 1906 the canal was enlarged at a cost of $1,500. Water rights were formerly sold at $4 per acre. Later a mutual stock company was organized with a capital stock of $10,000. Each share represented the water right for 160 acres and had a par value of $1.600. There are 2,200 acres below this canal and it is usually all irrigated. The maintenance and operation charges are small, about 20 cents per acre.

The following table shows the status of the canals along Blue Creek:

STATUS OF CANALS ALONG BLUE CREEK

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
High Line Ditch	D 795	1895	1.2	$ 850.00	.....	.....	.....	.....	.....	.....	Never completed
West Side Ditch	D 800	1895	5.	3000.00	1898	.....	.....	.....	.....	.....	District formed A 515
Paisley Irrigation District	A 515	1898	1.	900.00	1914	6.	1645	800	1645	$ 1.25	Irrigation District
Eggers Extension	A 1154	†	.....	.....	.....	.....	.....	.....	.....	.....	
Delatour Reservoir	A 1374*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Blue Creek Canal	D 785	1894	12.5	10000.00	1914	12.5	3170	2970	2970	.75	Irrigation District
Blue Creek Ditch	D 781	1893	3.5	1455.00	1914	3.5	1240	800	1240	.....	Partnership
Iowa Irrigation and Imp Co. D.	D 786	.....	.....	.....	.....	.....	.....	.....	.....	.....	Included under D 781
Union Irrigation and W. P. C.	D 763	1890	4.	1676.00	1914	4.	1200	900	1135	.10	Corporation
Graff Canal	D 788	1894	8.	5000.00	1914	8.	2262	2200	2262	.20	Mutual Stock Co.
	Totals	.....	35.2	$ 22881.00	.....	34.0	9417	7670	9252		

* Water right pending.

† No further information available.

CANALS ALONG WHITE TAIL CREEK

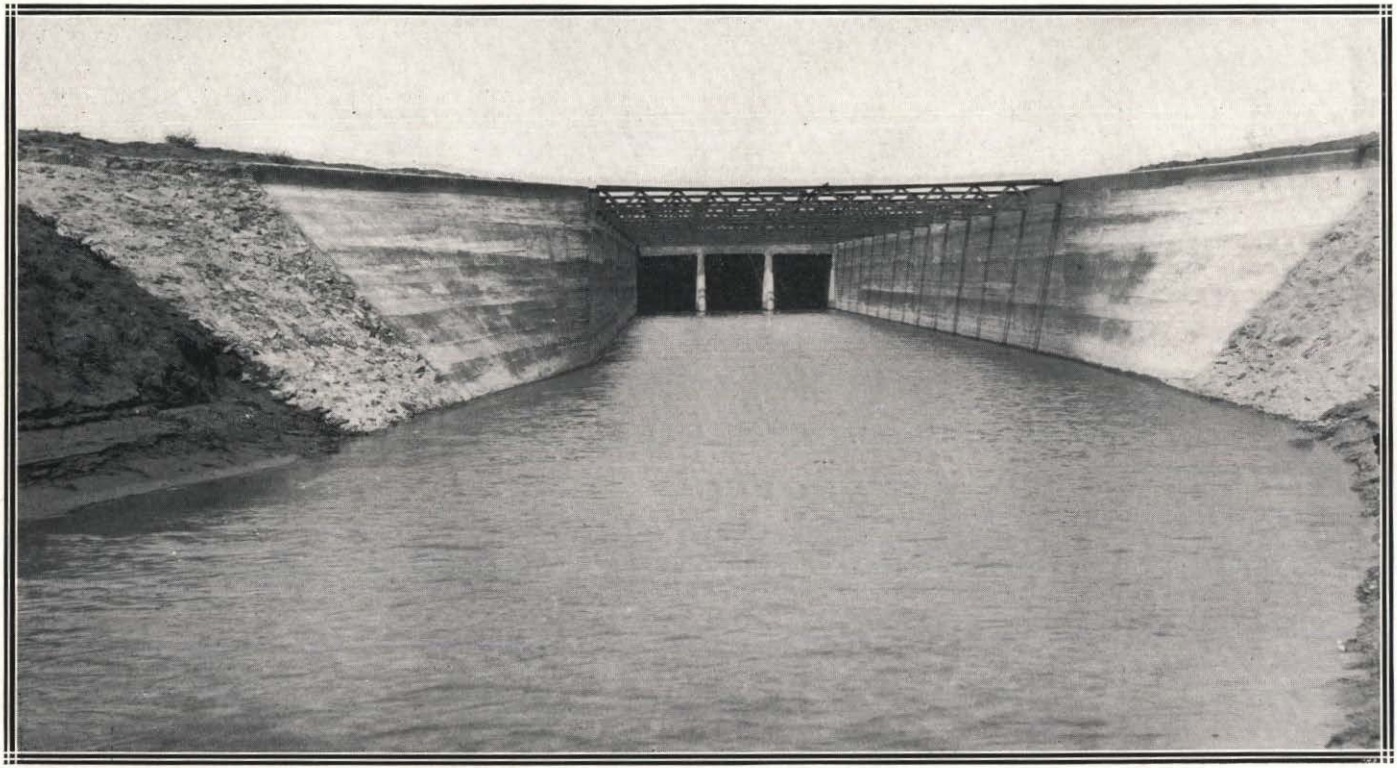
KEYSTONE CANAL (A-662b, 843, 1003). On July 18, 1891, a land and cattle company posted a notice of appropriation claiming twenty-one second-feet of water, and constructed 6½ miles of canal at a cost of $2,400. Later, it practically abandoned the canal. Parties wishing to use the water of the creek for irrigation started to contest the right of the land and cattle company and a compromise was reached whereby they obtained three-sevenths of the control of the old canal. Several years later the canal was again practically abandoned. On April 26, 1902, successors to the company made a new application for a water right of 45.70 second-feet and re-opened and slightly straightened the canal. One of the stockholders of the new company became sole owner, and on November 30, 1906, made an application for an additional water right of 4.29 second-feet, and at this time straightened the alignment of the canal considerably. In the meantime, he had acquired several other small canals in the purchase of adjoining lands, but practically abandoned them by supplying all the water used from the Keystone canal. In 1909, he organized the Keystone Irrigation Company, with a capital stock of $140,000, and listed all his lands for sale. On May 27, 1910, an application for an aditional water right of nine second-feet was made in the name of the company, in order to secure a water right for every acre.

The agent with whom the lands were listed re-opened, straightened, and lengthened the canal sufficiently to cover all the lands on the east side of the creek, making a few applications for small water rights and relinquishing others in order to clear the water-right records. About $3,000 was spent in making these improvements. Four thousand acres under this canal were sold at $20 per acre. Each acre carried with it a water right and stock in the Keystone Irrigation Company, which is now operating the canal. Three thousand acres were irrigated in 1914. The maintenance and operation charges are low, 15 cents per acre.

WEST KEYSTONE (A-1001). At the time the Keystone Irrigation Company was organized there was no canal to cover the land west of White Tail Creek. An application for a water right of 1¾ second-feet was made for these lands, and the West Keystone ditch, 1¾ miles long, was built at a cost of $1,000. The lands under this ditch were sold on the same terms as those east of the creek. The canal is owned and operated by the Keystone Irrigation Company. There are 180 acres below this ditch, all of which are irrigated at about 15 cents per acre.

FOSTER KEYSTONE CANAL (D-730). A notice of appropriation was posted on October 30, 1894, and in 1895, five miles of canal were built at a cost of $400. Stock of the Keystone Irrigation Company was issued for the canal, and water is now supplied to the lands from the Keystone Canal.

The following tables shows the status of the canals along White Tail creek:



RAWHIDE SYPHON, INTERSTATE CANAL, U. S. R. S.

STATUS OF CANALS ALONG WHITE TAIL CREEK

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Reed Ditch	D 751	1890	.7	$ 48.00	1914	.7	40	40	.....	.....	Private
Little Dandy	D 727	1894	2.2	326.00	1907	.....	140	.....	.....	.....	
Keystone Canal.....z	D 716	1891	6.5	2400.00	1898	.....	.....	.....	.....	.....	Right cancelled
Keystone Canal.....z	A 662b	1902	.....	750.00	.....	.....	.....	.....	.....	.....	Reopened D 716
Keystone Canal.....z	A 843	.....	.....	.....	.....	.....	.....	.....	.....	.....	d-A 662b
Keystone Canal.....z	A 1003	1909	2.5	3000.00	1914	9.	4320	3000	4320	.15	Mutual Stock Co.
West Keystone	A 1001	1910	1.7	1000.00	1914	1.7	180	120	180	.15	Mutual Stock Co.
Halloway & Phelps	D 717	1893	1.	275.00	1914	1.	250	70	160	.15	Private
John H. Bower	A 428	1898	.7	150.00	1909	.....	y	.....	.....	.....	
Foster Keystone C	D 730	1895	5.	400.00	1906	.....	y	.....	.....	.....	
J. M. McCarthy	D 749	1890	1.2	275.00	1914	1.2	100	70	.....	.15	Private
	Total's	.....	21.5	$ 8624.00	.....	13.6	5030	3300	4660		

d- An additional water right for ditch (number).

z The following water rights have been granted for Keystone canal. i.e., D 716, A 662b, A 843 and A 1003, but the right D 716 has been cancelled. The acreage and results are shown under A 1003.

y Lands formerly under the John H. Bower and the Foster Keystone ditches are now watered from the Keystone Canal, and this acreage is included under that Canal (A 1003).

CANALS ALONG BIRDWOOD CREEK

BIRDWOOD IRRIGATION DISTRICT (D-646). The Equitable Farm and Stock Improvement Company posted a notice of appropriation on October 21, 1893, for the diversion of 100 second-feet, and during the next two years constructed twenty miles of canal at a cost of $17,804. The company sold some water rights but the enterprise was not a financial success as the lower eight miles of the canal were hard to maintain and the delivery of water to the lands under the end of the canal was very uncertain.

On November 1, 1905, a petition signed by twenty landowners was presented to the board of county commissioners of Lincoln county, praying for the organization of an irrigation district to include the land under the upper twelve miles of the canal. On December 26, 1905, the commissioners approved the petition and called an election to be held January 27, 1906. On February 5, the commissioners met as a canvassing board, and finding 15 votes "yes" and one "no," declared the district duly organized. Bonds in the sum of $18,000 were voted and paid to the company, who cancelled all water rights under the lower end of the canal. The land within the district, for district purposes, is assessed on a valuation of $10 per acre. The maintenance and operation levy for 1914 was 30 mills, and that for bonds, 20 mills, making the cost of water per acre 30 cents for maintenance and operation, and 20 cents to cover bonds and interest, making a total of 50 cents.

The district has an area of 5,680 acres, of which only 600 acres were irrigated during the season of 1914. Much of the land under this canal is subirrigated and does not need flooding.

The following tables show the status of the canals from Birdwood creek and other tributaries of the North Platte river:

STATUS OF CANALS ALONG BIRDWOOD CREEK

	No.	Built		Cost	Operated		Acreage			✦M. & O.		
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	1914	
McCabe Canal	A 602	1901	7.	$ 4000.00	1914	7.	900	350	.....	.....	.....	Private
Birdwood Irri. & W. P. Co	A1350	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Beaucamp Canal	D 677	1895	2.5	1350.00	1914	2.5	250	100	.....	.....	.....	Private
West Side Birdwood	D 652	1894	3.	.....	1914	2.5	600	125	.....	.....	.....	Partnership
Birdwood Canal	D 646	1894	20.	17804.00	1914	12.	7000	400	.....	.43	.50	Irrigation District
	Totals	.....	32.5	$ 23154.00	.....	24.0	8750	975				

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
HORSE CREEK											
Caldwell	A 1078*										
Marsh & Braziel C	A 921	1900	2.	$ 400.00	1914	2.	1100	400	545	$ .25	Partnership
Marsh & Braziel C	A 1126*										d- A921
State Line Ditch	A 407	1897	2.5	1300.00	1914	2.5	1000	350	240		Private
State Line Ditch	A 994										d- A407
Gilmore	A 983	1900	2.		1914	2.	600		320		e- A407
Jackson's Extension	A 1000	1910	.5	200.00	1914	.5	75	70	72		e- A983
Horse Creek Ditch	A 742	1904	2.	600.00	1914	2.	300	40			Private
	Totals		9.0	$ 2500.00		9.0	3075	860	1177		
KIOWA CREEK											
Currie Ditch	D 938	1892	.6	$ 800.00	1895		160				
Lowry Canal	A 746	1906	1.	600.00	1911		70				
Kellum's Ditch	A 641	1901	1.7	400.00	1914	1.7	170	20	40	$ 2.00	Private
Kellum's No. 2	A 880	1908	.3	50.00	1914	.3	40	10	10		Private
	Totals		3.6	$ 1850.00		2.0	440	30	50		
OWL CREEK											
Sunflower Ditch	A 411	1898	1.	$ 1000.00	1914	1.	185	85	185	$ .35	Private
Sunflower Ditch	A 770										d- A411
Sunflower Ditch	A 881										d- A411
Sunflower No. 2 Ditch	A 879	1907	.3	300.00	1914	.3	300	190	140	.25	Private
	Totals		1.3	$ 1300.00		1.3	485	275	325		

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O.	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	
SHEEP CREEK											
Little Moon	A 745	†	.....	.....	.....	.....	.....	.....	.....	.....	
Nebraska Reservoir	A 859	†	.....	.....	.....	.....	.....	.....	.....	.....	
Horse Camp Reservoir	A 885	†	.....	.....	.....	.....	.....	.....	.....	.....	
West Fork Ditch	A 871	†	.....	.....	.....	.....	.....	.....	.....	.....	
Favorable	A 873	†	.....	.....	.....	.....	.....	.....	.....	.....	
Home Ranch	A 876	†	.....	.....	.....	.....	.....	.....	.....	.....	
Horse Pasture Canal	A 877	†	.....	.....	.....	.....	.....	.....	.....	.....	
Number 2	A 890	†	.....	.....	.....	.....	.....	.....	.....	.....	
Langhoff Ditch	A 1303*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Vonberg Ditch	A 1311*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Sheep Creek Lateral	A 1176*	†	.....	.....	1914	.....	.....	.....	230	.....	
ETERNAL SPRINGS											
Dyer Ditch	A 1370*	†	.....	.....	.....	.....	.....	.....	.....	.....	
SPOTTED TAIL CREEK											
H. G. Stewart	A 449	†	.....	.....	.....	.....	.....	.....	.....	.....	
Stewart Reservoir	A 743	†	.....	.....	1914	.....	.....	.....	125	.....	
Brown Ditch	A 1072	†	.....	.....	1914	.....	.....	.....	160	.....	
T. L. Co. Canal No. 2	A 1123*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Roberts Ditch	A 1241*	†	.....	.....	.....	.....	.....	.....	.....	.....	
SEEPAGE											
Enterprise Irrigation District	A 1290*	†	.....	.....	.....	.....	.....	.....	.....	.....	
WIND SPRINGS											
Wind Springs Canal	D 954	†	1.7	$ 220.00	1914	1.7	100	.....	30	.....	Private
Smith Ditch	A 986	†	.....	.....	.....	.....	.....	.....	.....	.....	

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	
TUB SPRINGS										
T. L. Co. No. 2	A 1103*	†								
SPRING CREEK										
Shramek Canal	A 1295									
M. G. Gilchrist	A 1310	†								
SEEPAGE										
Enterprise Irrigation District	A 1291*	†								
WINTER CREEK										
Bouton Ditch	D 923	†								
SEEPAGE										
Huffman's Ditch	A 937	†			1914				120	
SPRING CREEK										
Gatch Ditch	A 1220	†			1914				70	
NINE MILE CANYON										
Side Hill Irr. Canal	A 1164*	†								
BORROW PIT										
Borrow Pit Ditch	A 751	†							40	
MIDDLE CREEK										
Bartling Ditch	D 870	†								
Bartling Ditch No. 2	D 891	†								

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
SPRINGS											
Cundall Ditch	A1148	†	.....	.....	1914	.....	.....	.....	148	.....	
SCHUETZ SPRINGS											
Schuetz Springs Canal	D 881	†	.....	.....	1892	.....	.....	.....	25	.....	
SPRING on Sec. 28-18-49											
Finn Bros. Ditch	D 386	.....	1.	$ 110.00	1914	1.	35	.....	30	.....	Private
CAMP CREEK											
Camp Creek Ditch	D 866	.....	1.	215.00	1914	1.	100	100	100	.....	Private
CEDAR CREEK											
Radcliff Ditches	A1051	†	.....	.....	1912	.....	.....	.....	120	.....	
BROWN'S CREEK											
Hackberry Ditch	A 717	.....	1.	.....	1914	1.	80	1	30	.....	Private
LOWER DUGOUT CREEK											
Mulloy Ditch	A 865	1905	.2	.....	c	.....	70	.....	25	.....	
Cooper Ditch	D 872	1892	.7	$ 100.00	1914	.7	80	60	80	.80	Private
Hubbard Ditch	A1005	1909	.2	50.00	.....	.....	20	.....	.....	.....	In litigation
Hubbard Ditch	A1222	d-A1005	.....	.....	.....	.....	.....	.....	.....	.....	
Hagerty Ditch	A1238	1900	.7	500.00	1914	.7	150	70	80	.60	Private
	Totals	.....	1.8	$ 650.00	.....	1.4	320	130	185		
COLD WATER CREEK											
Cold Water Ditch	D 796	.....	1.5	$ 445.00	c	.....	330	.....	.....	.....	Obliterated

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
ASH CREEK											
Gillard Ditch	D 812	1891	1.	$ 250.00	1914	1.	100	35	.....	.....	Private
McCormick	D1011*	1896	.....	.....	1896	.....	.....	.....	.....	.....	
Vance Ditch	D 765	1890	.5	50.00	1893	.....	80	.....	.....	.....	
	Totals	.....	1.5	$ 300.00	.....	1.	180	35	.....	.....	
PLUM CREEK											
Plum Creek Ditch	A1344	†	.....	.....	.....	.....	.....	.....	.....	.....	
CLEAR CREEK											
Scott & Williams	D 747	1894	1.5	$ 180.00	1914	1.	73	50	73	.....	Private
Green Ditch	D 745	.....	1.2	135.00	1914	3.7	960	920	.....	.....	
Clear Creek Canal	D 754	1893	2.	425.00	.....	.....	.....	.....	775	.....	e- D745
Clear Creek Ditch	D 756	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D745
Clear Creek Extension	A1111	.....	.5	.....	.....	.....	80	.....	80	.....	e- D745
Clear Creek Ditch	D 748	1892	.7	25.00	1914	.7	200	.....	200	.....	Private
Finch Ditch	D 964	1890	.7	100.00	1914	.5	100	60	100	.....	Private
	Totals	.....	6.6	$ 865.00	.....	5.9	1413	1030	1228		
SAND CREEK											
Patrich Ditch	D 725	1891	1.2	$ 225.00	1914	1.2	220	90	170	.....	Private
Nissen Ditch	A 606	1901	.5	75.00	1914	.5	270	175	210	.15	Private
Holcomb & Smith	D 698	1889	2.	157.00	1914	2.	560	50	160	.50	Private
	Totals	.....	3.7	$ 457.00	.....	3.7	1050	315	540		
OTTER CREEK											
Otter Ditch	A1198	†	.....	.....	1914	.....	.....	.....	380	.....	
Peterson Ditch	A1240	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Cascade Canal	D1032*	†	.....	.....	.....	.....	.....	.....	.....	.....	

ACTUAL AND PRACTICAL IRRIGATION

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Cascade Canal	A 1073	†	.....	.....	.....	.....	.....	.....	.....	.....	
Peterson & Fair	A 1130*	†	.....	.....	.....	.....	.....	.....	.....	.....	
SPRING CREEK											
Spring Creek Ditch	D 724	1894	1.	$ 100 00	1914	.7	25	15	5	.....	Private
LONERGAN CREEK											
East Lonergan Ditch	D 669	1891	2.5	675.00	1914	2.5	600	320	530	.....	Private
Soehl Ditch	D 697	1893	2.	300.00	1914	1.	237	100	237	.....	Private
Hansey Ditch	D 719	.....	.7	100.00	1914	.7	80	.....	80	.....	Private
	Totals	.....	5.2	$ 1075.00	.....	4.2	917	420	847		
GOLDEN CREEK											
Theis Ditch	A 160	1897	1.	$ 50.00	1914	1.	220	200	220	.....	Private
SPRING CREEK											
Spring Creek Ditch	D 704	1890	1.	100.00	c	.....	100	.....	.....	.....	
Spring Creek No. 1	A 1002	1910	1.	500.00	1914	1.	100	80	60	.....	Private
	Totals	.....	2.	$ 600.00	.....	1.	200	80	.....		
LITTLE SPRING CREEK											
Little Spring Ditch	A 659	1902	.6	$ 25.00	1914	.6	40	.....	40	.....	
MATHEWS CREEK											
Mathews Canal	D 750	1896	.4	350.00	1914	.4	65	25	65	.....	Private
COON CREEK											
Coon Creek Ditch	A 69	1894	.3	300.00	1914	.3	220	160	220	.15	Private
Coon Creek Ditch	A 1225	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A69
SPRING BRANCH CREEK											
Brogan Bros. Ditch	A 410	1897	1.	330.00	1914	1.	130	40	.....	.....	Private

STATUS OF CANALS OTHER TRIBUTARIES OF THE NORTH PLATTE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
SKUNK CREEK											
Miller Ditch	D 740	1895	1.3	$ 90.00	1914	1.	160	100	160	.....	Private
Skunk Creek Ditch	A 968	1910	1.	200.00	1911	.....	400	.....	.....	.....	
	Totals	.....	2.3	$ 290.00	.....	1.	560	100	160		
BUCKHORN SPRINGS											
P. P. Maddux	A 918	1908	1.	$ 100.00	1912	.....	200	100	.....	.....	Private
SAND CREEK											
Sand Creek Ditch	A 974	1911	1.	200.00	1914	1.	160	100	.....	.....	Private
CEDAR CREEK											
Clear Creek Ditch	A 1051	†	.....	.....	.....	.....	.....	.....	.....	.....	
STREAM—NO NAME											
Newberry Ditch	D 688	†	.....	.....	.....	.....	.....	.....	.....	.....	
SNAKE CREEK											
Elmore Canal	A 41	†	2.	.....	.....	.....	1000	.....	.....	.....	
Oasis Ditch	D 567	†	5.	4675.00	1914	5.	4000	.....	2134	.....	Private
Kilpatrick Res.	A 1104	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Kilpatrick Res. 2	A 1159	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	Tot's	.....	7.0	$ 4675.00	.....	5.	5000	.....	2134	.....	
BEAVER LAKE											
Beaver	A 1018	†	.....	.....	.....	.....	.....	.....	.....	.....	
CRESENT LAKE											
Crescent Lake	A 1024*	†	.....	.....	.....	.....	.....	.....	.....	.....	

† No further information available.
d An additional water right for ditch (number).
* Water right pending.
c Ditch not used for years.
e An extension to ditch (number).
✦ Maintenance and Operation.

SUMMARY OF CANALS IN THE NORTH PLATTE DRAINAGE BASIN

The following table for the drainage basin of the North Platte river is self-explanatory:

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
North Platte River	57	783.0	421911	$ 9,773,014	39	649.0	368,158	185,800	254,735
Pumpkin Seed Creek	24	46.6	8091	18,984	19	38.5	7,571	4,500	3,304
Huntington Springs	1	.....	.....	.....	1	.....	.....	.....	.....
Willow Creek	2	2.4	220	1,000	2	2.4	220	.....	210
Lawrence Creek	10	8.1	1,225	1,635	9	7.1	1,225	450	907
Greenwood Creek	5	10.1	1,345	5,220	5	9.1	1,345	470	310
Total for Pumpkin Seed Creek	42	67.2	10881	26,839	36	57.1	10,361	5,420	4.731
Blue Creek	6	35.2	9447	22,881	5	34.0	9,447	7,670	9,252
White Tail Creek	8	21.5	5,033	8,624	5	13.6	4,890	3,300	4,660
Birdwood Creek	4	32.5	8750	23,154	4	24.0	7,630	975	.....
Horse Creek	3	9.0	3075	2,500	3	9.0	3,075	860	1,177
Kiowa Creek	4	3.6	440	1,850	3	2.0	210	30	50
Owl Creek	2	1.3	485	1,300	2	1.3	485	275	325
Sheep Creek	1	.....	230	.....	1	.....	.....	.....	230
Spotted Tail Creek	2	.....	285	.....	2	.....	.....	.....	285
Wind Springs	1	1.7	100	220	1	1.7	100	.....	30
Seepage	1	.....	120	.....	1	.....	.....	.....	120
Spring Creek	1	.....	70	.....	1	.....	.....	.....	70
Springs	1	.....	148	.....	1	.....	.....	.....	148
Schuetz Springs	1	.....	25	.....	.....	.....	.....	.....	.....
Springs on 28-18-49	1	1.0	35	110	1	1.0	35	.....	30
Camp Creek	1	1.	100	215	1	1.0	100	100	100
Cedar Creek	1	.....	120	.....	.....	.....	.....	.....	120
Brown's Creek	1	1.0	80	.....	1	.....	80	1	30
Lower Dugout Creek	4	1.8	320	650	2	1.4	230	130	185
Cold Water Creek	1	1.5	330	445	.....	.....	.....	.....	.....

SUMMARY OF CANALS IN THE NORTH PLATTE DRAINAGE BASIN—(Continued)

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
Ash Creek	3	1.5	180	300	1	1.0	100	35	.....
Clear Creek	4	6.6	1413	865	4	5.9	1,413	1,030	1,228
Sand Creek (Range 40)	3	3.7	1050	457	3	3.7	1,050	315	540
Otter Creek	1	.....	380	.....	1	.....	.....	.....	380
Spring Creek (range 40)	1	1.0	25	100	1	.7	15	15	5
Lonergan Creek	3	5.2	917	1,075	3	4.2	850	420	874
Golden Creek	1	1.0	220	50	1	1.0	220	200	220
Spring Creek (Range 37)	2	2.0	200	600	1	1.0	100	80	60
Little Spring Creek	1	.6	40	25	1	.6	40	.....	40
Mathews Creek	1	.4	65	350	1	.4	65	25	65
Coon Creek	1	.3	220	300	1	.3	220	160	220
Spring Branch Creek	1	1.	130	330	1	1.0	130	40	.....
Skunk Creek	2	2.3	560	290	1	1.0	160	160	160
Buckhorn Springs	1	1.	200	100	.....	.....	.....	100	.....
Sand Creek	1	1.	160	200	1	1.	160	100	.....
Snake Creek	2	7.	5000	4,675	1	5.	4,000	.....	2,134
Totals	72	145.7	39950	71,666	56	115.8	34,805	15,961	22,738
Total for Basin	171	995.9	472742	$ 9,871,519	131	821.9	413,325	207,181	282,204

IRRIGATION IN THE SOUTH PLATTE DRAINAGE BASIN

The first irrigation enterprise undertaken within the valley of the South Platte river was in 1871. A company organized and incorporated built a ditch which diverted water from the river about three miles west of the town of North Platte. A period of inaction of nearly twenty years followed before any further attempts were made and it was during 1895 to 1899 when the greater number of the ditches along the river were built. There are sixteen existing appropriations from the river, totaling 363.34 second-feet. Eleven of these either have been practically abandoned or have not been used for a period of years, and in addition, two water rights were formerly granted, the canals partially completed and then abandoned, and the water rights have since been cancelled. During the past, seventeen canals have been built, but during the season of 1914 only four canals were in operation. This poor showing is attributed to the fact that nearly all of the canals were built at a time when the flow of the river was sufficient, with the exception of short periods during the hot summer months, to supply the demand for irrigation. Later, appropriations were made and large canals constructed in the state of Colorado, and these are now practically diverting the entire flow of the river within that state. This condition has existed for so many seasons that all but a few of the canals along the river in Nebraska have been abandoned, one of the difficulties that arises on interstate streams. Considerable area in the valley could be irrigated by pumping from the underground water supplies and from the underflow of the river.

The crops grown are alfalfa, wild hay, wheat, potatoes and some sugar beets. The latter are contracted to the sugar factories located in Colorado at $5 per ton.

The main line of the Union Pacific railroad traverses this valley, and the railroad facilities are very good.

CANALS ALONG THE SOUTH PLATTE RIVER

WESTERN IRRIGATION DISTRICT (A-393). A petition praying for the organization of an irrigation district was presented to the board of county commissioners of Keith county, who approved the petition on August 24, 1895, and called an election for September 21. On September 30, the commissioners met as a canvassing board and finding the vote favorable to the district, declared it duly organized. Bonds in the sum of $25,000, which amount was based upon the estimates made from the surveys, were voted in 1896. No bonds were sold for cash, as no bids could be obtained and no contractor could be interested sufficiently in the work even to submit a bid for the construction. Final surveys reduced the estimated cost, and construction was begun in 1897, farmers within the district doing the work and taking their pay in bonds at the rate of 8 cents per cubic yard. The system was completed in 1899. The state board of irrigation granted a water right of 180 second-feet, issuing a certfiicate to the application under date of June 14, 1897.

Owing to the shortage of water in the river, due to diversions in Colorado under subsequent rights, all of the land within the district is seldom irrigated in a single season. The district has an area of 14,992 acres and in 1914 water was applied to 8,000 acres. Lands within the district, for district purposes, are assessed upon a valuation of $10 per acre. The levy for maintenance and operation in 1914 was 50 mills, and that for bonds, 25 mills, making the cost per acre for maintenance and operation 50 cents, and to cover bonds and interest, 25 cents, making a total of 75 cents.

The district has installed a reinforced concrete spillway, which cost $2,000, and it is the intention to install weirs in all of the laterals and to measure the water used by each water user.

MILLER AND WARREN DITCH (D-805). A notice of appropriation was posted January 5, 1895, and construction of the ditch was begun. In all about 6½ miles of canal have been built at a cost of about $3,000.

A mutual stock company has been organized and now controls the ditch. There are 3,000 acres under the canal and during 1914 about 1,000 acres were irrigated.

PAXTON IRRIGATION DISTRICT (A-130). This enterprise is now dead and the district has been abolished, yet a short synopsis of the court records covering the organization will illustrate the era of speculation that attended early irrigation development.

On August 24, 1895, an application was made by an individual for a water right. Immediately following this the Paxton Irrigation District was organized, a favorable vote being cast October 8, 1895. This election was held without the notice prescribed by law being given. The district employed no engineer, no surveys were made upon which to base estimates of the cost of construction, yet on February 29, 1896, the board of directors held a special meeting and ordered an election to be held April 4, for the purpose of voting bonds in the sum of $27,000. The election was held and the board of directors declared that the bonds had carried. No legal notice of this bond election was ever issued. About $11,000 of the bonds were used in paying for the construction of twenty miles of canal.

The district court of Keith county has held that the bonds were illegally issued and that they had been used in making payment upon illegal contracts. Some valid claims were found to exist and these had to be paid before the district was allowed to dissolve.

Approximately 5,000 acres could have been irrigated from this canal, but it never was opened up to the river. The state board of irrigation has cancelled the water right.

The following table shows the status of the canals from the South Platte river:

STATUS OF CANALS ALONG THE SOUTH PLATTE RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Western Irrigation District	A 393	1897-99	25.	$ 25000.00	1914	25.	14992	8000	14913	$ .70	Irrigation District
Miller & Warren Ditch	D 805	1895-98	6.5	3000.00	1914	6.5	3000	800	1800	.19	Mutual Stock
Kimball's Underflow Ditch†	A 482	1899-00	4.	1200.00	1912	.....	250	.....	150	.....	
Big Springs Canal	D 810	1895	2.	500.00	1914	2.	400	200	.....	.25	Private
Eaton & McGrath Ditch	D 755	1894	3.8	1425.00	1904	.....	1500	.....	.....	.....	
Home Irrigation Ditch	D 736	1898	2.	350.00	1909	.....	250	.....	.....	.....	
Ogalalla P. & Irrigation Co.	D 753	1889	10.	36000.00	c	.....	4000	.....	.....	.....	Right cancelled
Meyer Canal	A 283	1900	1.5	400.00	1911	.....	40	.....	67	.....	
Allen Canal	A 370	1897	3.3	700.00	1910	.....	400	.....	.....	.....	
South Side Plano Ditch	D 733	1895	2.	250.00	s	.....	.....	.....	.....	.....	
Riverside	D 744	1895	3.	2000.00	1900	.....	200	.....	.....	.....	
Cereal Irrigation Ditch	A 357	1896	8.	5000.00	c	.....	1600	.....	.....	.....	
Carnahan	A 903	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A357
Hollingsworth Ditch†	D 723	1895	6.	3000.00	1914	6.	2100	200	388	1.00	
Paxton Irrigation District	A 130	1897-98	20.	11000.00	s	.....	5000	.....	.....	.....	Cancelled
Lute & Sheridan Ditch	A 231	1896	3.	2000.00	1902	.....	700	.....	.....	.....	
Paxton & Southern Ditch	A 184	1898	3.	3500.00	1902	.....	400	.....	.....	.....	
Stebbins Canal	D 683	1894	1.5	1500.00	c	.....	500	.....	.....	.....	
	Totals	.....	104.6	$ 96825.00	.....	39.5	35332	9200	17318		
FREMONT SLOUGH											
Fremont Creek Ditch	D 686	1894	3.4	$ 592.00	c	.....	500	.....	.....	.....	

† No further information available.
c Ditch not used for years.
d- An additional water right for ditch (number).
s No water ever diverted.
✦ Maintenance and Operation.

CANALS ALONG LODGE POLE CREEK

The irrigated area within this valley consists of a very narrow strip lying adjacent to each side of the creek. The putting of a portion of the Kimball Irrigation District system into operation in 1912, placed water upon the higher benches bordering the creek in the vicinity of Kimball and a considerable acreage is being brought under irrigation.

The first irrigation enterprise within this valley was undertaken in 1871, when General Dudley, in command of Fort Sidney, employed the soldiers in building a dam across the creek and excavating a ditch which was used for irrigation at the fort. The results obtained here have been described on page 46. Settlement in the valley began about this time and during the seventies eight other dams and ditches were built and used for irrigation. A dam and ditches were built upon the present site of the Bordwell ditch in 1873. The dam was destroyed by flood in the succeeding years, but a new dam was built in 1889, and it and the ditches still are in use. The Bay State Cattle Company built a ditch 1½ miles long in 1876, which is still in operation. The same year a dam and a ditch were constructed on the present line of the Oberfelder ditch. In 1877, a dam was built near the present location of the W. C. Bullock ditch and flooded some hay land. During 1878 two dams and ditches were built, one upon the original location of the Borquist ditches and one upon the site of the Adams and Tobin ditch. In 1879 dams and ditches were built upon the present site of the Persinger ditch and also that of the Libby ditches. In practically all of these cases the dams and ditches were used for flooding hay lands along the creek bottoms.

Following this period, settlement of the valley became more rapid and many dams and ditches were built during the succeeding years. The banks of the creek are very low and but little labor is required to construct a serviceable dam of earth. Dams averaging 75 feet long and 4 to 10 feet high are to be found every half to three-quarters of a mile apart along the entire course of the creek, with the exception of those portions of the stream bed where the stream disappears in the sand and the channel is dry. Owing to the sandy bed of the creek, the construction of a permanent dam is costly and but very few have been built. Heavy spring floods are prevalent, and thus the greater portion of the expense of maintenance and operation on the canals goes in keeping the earth dams in repair.

As previously noted, the discharge of the Lodge Pole creek is very small, yet in comparison with its size the creek is the most completely utilized stream in the state. This is explained by the fact that the creek is fed by numerous springs along its entire course, and also by the fact that the irrigated lands lie in such close proximity to the stream that the return waters reappear promptly. It has been an observed fact that when all the flow was being diverted at one point, the stream a half-mile farther down would be flowing again the same as if no water had been diverted above.

VIEW SHOWING DROPS IN LARGE LATERAL OF IRRIGATION DITCH, WESTERN NEBRASKA

Considerable opposition to the state control of the distribution of the water along this stream still exists among some of the early appropriators. Some declare that at the time they diverted the water of the creek and applied it to a beneficial use it was impossible under the existing state irrigation laws to file upon the waters of a stream less than twenty feet in width. Others declare that under the Government surveys this was never meandered but was measured in with the land and when one filed upon the land, he received the running water with it.

There are 101 existing appropriations from the stream, totaling 197.31 second-feet. Of the above number, 15 either have been abandoned or have not been used during the past two years; eight are merely for extensions or enlargements of existing ditches, and on two of these no construction work has been done; work has been done on three; one is under construction; and one is for a system of storage reservoirs and distributing ditches. No data could be obtained regarding three of the appropriations. In addition, there are three ditches and four pumping plants which use water from the stream but have made no application for water rights. One of these ditches diverts its water in Wyoming, but the acreage irrigated lies within Nebraska.

There have been 88 ditches built along the creek, but only 70 were in operation during 1914. All of these, with two exceptions—one partnership and one irrigation district—are operated as private ditches. Several ditches are owned by livestock companies, but these are used only to irrigate the lands belonging to these companies and are classed here as private ditches.

The year 1914 was very unfavorable, as little rain fell after the middle of May and there was a scarcity of water during the growing season.

During the average season alfalfa can be cut three times. The wild grass in many of the hay fields is now mixed with wheat grass or timothy, and such hay sells for considerably more than wild grass alone. Corn and other small grains yield as heavily as in the eastern portion of the state where grains are grown without irrigation.

The main line of the Union Pacific Railroad Company traverses this valley, thus providing good railway facilities to eastern and western markets.

PREMIER DITCH (D-340.) This ditch was built by its present owner in 1893. A stone dam which raises the water level in the creek about two feet was built across the stream, and the water diverted from the north bank. About a half-mile below the dam the ditch branches. The south branch, which is about a mile in length, crossed the creek in a flume and covered some wild hay ground on the south side. The north branch continued along the north side of the creek for approximately a mile. The total cost of construction was $1,250. The flume on the south branch has been washed out for some time, and that ditch has not been in operation, but the north branch is still in operation. This ditch covers

200 acres of wild hay ground and during the season of 1914 about 170 acres were irrigated.

YOUNG DITCH (D-349). This ditch is 1½ miles long and was built in 1880 at a cost of $47. An earth and rock-fill dam raises the level of the water in the creek between three and four feet. There are 85 acres lying below this ditch, but no water has been granted for 50 acres of it. The 35 acres for which water has been granted usually are irrigated every year. The cost of keeping up the ditch is about $50, or $1.45 per acre.

KIMBALL IRRIGATION DISTRICT (A-897). The Kimball Irrigation District was organized by local parties who filed an appropriation for a storage project April 15, 1908. On July 22, 1909, a petition signed by twenty-four landowners was presented to the board of county commissioners of Kimball county, praying for the organization of an irrigation district, and on October 9, the board approved the petition and called an election for November 6. On November 15, the commissioners met as a canvassing board, and finding an unanimous vote in favor of the district, declared it duly organized. On April 9, 1910, bonds in the sum of $250,000 were voted for the construction of the project. These were isued under date of July 1, 1911. They were all sold during 1911, the purchasers being mostly local men. The project when completed will comprise two storage reservoirs. The lower one, located seven miles west of Kimball, has been formed by building an earthen dam 4,900 feet long, with a maximum height of 45 feet, across the bed of the creek. The dam contains 221,000 cubic yards of material. The capacity is 7,200 acre-feet, but the plan is to partially refill the reservoir each season and so increase the supply to 9,000 acre-feet. To prevent wave action, the dam has been protected with a reinforced concrete face laid in sections.

The water is diverted from the reservoir through one outlet on the north side of the creek. About one-half mile below the dam the canal branches and the south canal crosses the stream in a steel flume. This branch is twenty miles long, while the north branch is fourteen miles long. The system covers 7,200 acres of irrigable land, and during the season of 1914 over 80 per cent of the land was actually irrigated. In the construction of the system fourteen steel flumes were used. These cost $35,500 in place. The largest flume is 1,100 feet long and has a maximum height of 56 feet.

For the purpose of levying assessments to meet maintenance and operation charges, bond-sinking fund, and interest on bonds, the land is valued at $50 per acre. The levy for maintenance and operation in 1914 was 12 mills, and that covering bonds is 45 mills, making the cost of water per acre 60 cents for maintenance and operation, and $2.25 for sinking fund and interest.

The second reservoir is to be located seven miles farther up the stream, and the north ditch is to be extended eight miles, thus supplying water to an additional 5,000 acres. The additional cost of construc-

tion will be met by issuing bonds which will be a lien upon the additional 5,000 acres. Surveys for these extensons have been made and the necessary filing perfected.

NEW RUTTNER DITCH (A-727). The ditch was built in 1904, and is an enlargement and extension of a small ditch built in 1886, known as the Ruttner ditch. It is 2½ miles long, and cost approximately $500. An extension known as the Clark ditch was built in 1906, and later a second extension known as the Yoder Extension was built. In 1908 an additional application for a water right was made for all of the lands under the ditch, thus bringing a total of 270 acres under the lower end of the New Ruttner ditch.

Including these extensions, the ditch is approximately 4½ miles long, and cost about $800. There are about 500 acres lying below this ditch and 400 acres were irrigated during 1914.

KINNEY DITCH (D-345). This ditch was built in 1884. The original headgate was located in Section 33, Township 15 north, Range 56 west, but in later years the ditch was extended up the valley, along the line of a small ditch known as the Ruttner South Side. The ditch is four miles long and cost $600. There are 225 acres under this ditch covered by the two water rights and usually it is all irrigated each season.

HURLEY, LILLY AND POLLY DITCH (D-354). This is a partnership ditch. The original ditch was about 4½ miles long and about 300 acres could be irrigated from it. At present only 2½ miles of ditch are in operation and 190 acres can be irrigated. The partners use the rotation method, each getting the entire flow of the ditch for a period of eight days. By following this method they usually irrigate the entire acreage lying below the ditch each season. They estimate that it costs about $90 per year to maintain and operate the ditch, $50 of which is spent in keeping the dam in repair. Without doubt more is accomplished with the water that is measured into this ditch than from any of the other ditches along the creek.

BAY STATE DITCH (D-347). This ditch is 1½ miles long. It was built in 1876 at a cost of $610. In 1892, the ditch was enlarged and extended. There are 125 acres under the Bay State Ditch proper, 80 acres of which are in alfalfa and irrigated. The acreage under the extension is shown in the tables following.

GUNDERSON DITCH (D-305). This ditch was built in 1883. It is 1.7 miles long and cost $995. There are 150 acres lying below this ditch, of which 100 acres were irrigated during 1914. It costs about $50 per year to keep up the ditch, the principal item of expense being repairing the damage done by muskrats. There is a power plant in connection with the ditch and during the summer when the water is not being used for irrigation, the owner lights his place by electricity. During the winter months, the water is used to run a grist mill.

ANDERSON DITCHES NOS. 1 and 2 (D-372-3). These ditches were built in 1881. Originally there was only one ditch which was 2½ miles long and crossed the creek at two points by flumes. The lower flume, two miles below the headgate, later was replaced by a dam across the creek, and a new headgate was installed for the lower half mile of the original ditch, thus making two ditches. The original cost of the ditch was $500, and when the flume was replaced an additional $300 was spent upon the ditch. There are 200 acres below Ditch No. 1, of which 150 acres were irrigated in 1914 at a cost of about 15 cents per acre. Ditch No. 2 has 60 acres below it. This land is all in alfalfa and wild hay.

TROGNITZ CANAL (D-365). This ditch was built in 1890. It is on the east side of the creek and follows the line of a ditch built by the soldiers at Fort Sidney in 1876 to furnish the water supply at the fort. There was a ditch on the west side of the creek, but this has not been used for several years.

The following tables show the status of canals along Lodge Pole creek and its tributaries:

STATUS OF CANALS ALONG THE LODGE POLE CREEK

	No.	Built		Cost	Operated		Acreage			✦M. & O.	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	
Tracy Ditch North	.....	1883	2.	$ 500.00	.....	.....	80	.....	.....	.....	
Tracy Ditch	A 870	1887	.7	100.00	1914	.7	70	35	35	$ .10	Private
Hoover Ditch	D 353	1887	1.	150.00	1914	1.	100	100	100	.10	Private
Independent Ditch	D 343	1889	2.5	1200.00	1914	1.2	250	240	220	.25	Private
Smeed Ditch	D 341	1883	2.	1300.00	1914	2.	100	.....	100	.....	Private
Premier Ditch	D 340	1883	2.0	1250.00	1914	1.5	200	150	170	.60	Private
Bushnell Ditch	A 504	.....	2.	.....	1914	2.	210	210	210	.....	Private
Young Ditch	D 349	1880	1.5	47.00	1914	1.5	85	35	35	1.45	Private
Forsling Ditch	A 703	1904	2.5	1500.00	1911	.....	160	.....	.....	.....	
Forsling Ditch	A 806	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A703
Kimball Irrigation District	A 897	1911	34.	250000.00	1914	34.	7200	2450	5800	3.50	Irrigation District
Maltese Cross	A 454	1898	.6	200.00	1914	.6	15	15	15	1.00	Private
New Ruttner	A 727	1904	4.5	800.00	1914	4.5	500	475	400	.....	
Clark Ditch	A 842	1907	.....	.....	.....	.....	.....	.....	.....	.....	e- A727 (1)
Yoder Extension	A 857	1907	.....	.....	.....	.....	.....	.....	.....	.....	e- A727 (1)
Ext. Yoder North	A 922	o	.....	.....	.....	.....	.....	.....	.....	.....	o (1)
Walker Ditch	A 869	o	.....	.....	.....	.....	.....	.....	.....	.....	
Ruttner Ditch	D 350	1888	2.	690.00	1904	.....	(2)	.....	.....	.....	
Kinney Ditch	D 345	1894	4.	600.00	1914	4.	225	150	140	.....	Private
C. A. Forsling	A 718	1904	3.	400.00	1914	3.	200	200	200	.50	Private
Kinney Ditch No. 2	D 388	1889	3.	1000.00	1914	3.	190	100	190	.....	Private
Kinney Ditch	D 348	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D388
Hurley, Lilley and Polly	D 354	1892	4.5	677.00	1914	2.5	190	190	190	.50	Partnership
Bickel Ditch	A 719	1903	1.5	.....	1914	1.5	95	.....	75	.....	Private
E. L. Faden	A 724	o	.....	.....	.....	.....	.....	.....	.....	.....	d- A719
Polly Ditch	D 342	1881	1.5	405.00	1914	.7	85	85	85	.60	Private
H. H. Howe	D 344	o	.....	.....	.....	.....	.....	.....	.....	.....	d- D342
Bay State Ditch	D 347	1876	1.5	610.00	1914	1.5	125	105	105	.....	
Owasco	A 725	1892	5.5	5000.00	1914	5.5	800	500	770	.35	Private e- D347
Bennet Live Stock Res.	A 657	1892	.....	2000.00	.....	.....	.....	.....	.....	.....	

STATUS OF CANALS ALONG THE LODGE POLE CREEK—(Continued)

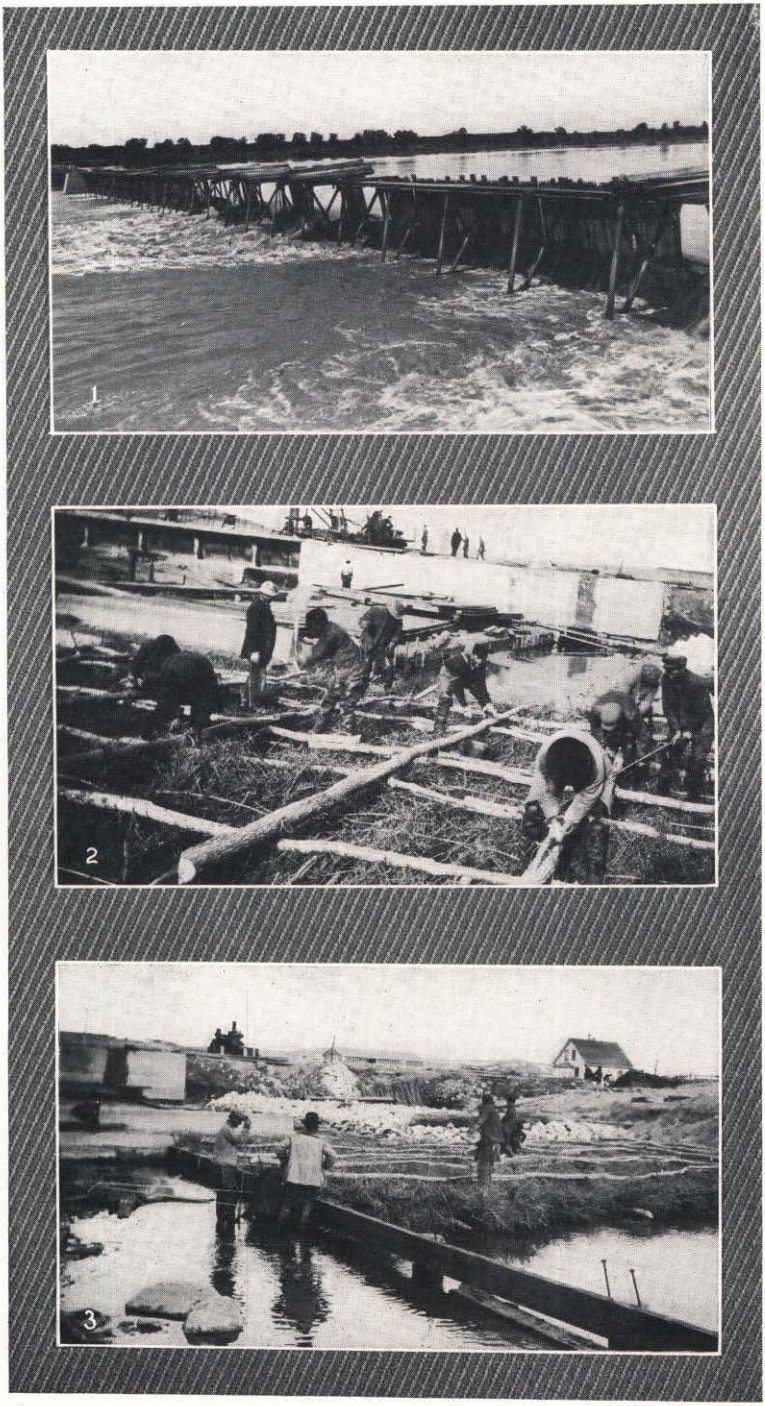
	No.	Built		Cost	Operated		Acreage			✦M. & O.	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	
Bennett Live Stock Co. Ditch	A 691	1902	1.	1500.00	1914	1.	130	100	130	1.00	Private
Bennett Reservoir	A 1313	†	.....	.....	.....	.....	.....	.....	.....	.....	
McIntosh	D 351	1886	2.5	450.00	1914	2.5	400	300	354	.35	Private
Owasco Ditch	A 734	.....	.....	.....	.....	.....	.....	.....	.....	.....	e- D351
Circle Arrow Ditch	D 346	1882	1.5	.....	1914	1.5	270	125	260	.60	Private
Bennett Ditch No. 5	A 934	1909	.7	1000.00	1914	.7	70	50	70	1.00	Private
Brady Ditch	A 352	1889	.7	.....	1914	.7	75	50	50	1.00	Private
Clausen South Side Ditch	A 683	1897	.5	125.00	.....	.5	80	60	.....	.35	
Clausen North Side Ditch	A 684	1896	.5	360.00	1911	.....	136	.....	.....	.....	
C. C. Burg	A 381	.....	.5	.....	1914	.5	10	10	10	.....	Private
Adams Ditch	D 371	1892	1.2	150.00	1914	.7	100	75	100	.50	Private
Adams Ditch	D 370	1895	1.5	450.00	1914	1.5	100	0	100	.....	Private
Adams Ditch	D 369	1895	.5	250.00	1908	.....	35	.....	.....	.....	Dam just completed
Gunderson Ditch	D 305	1883	1.7	995.00	1914	.7	150	60	100	.90	Private
Christenson Ditch	D 366	1893	.5	250.00	1914	.5	45	25	25	.....	Private
Christenson Ditch	D 367	1893	.5	150.00	1914	.5	30	25	25	.....	Private
J. Mitchell	D 304	1886	.5	125.00	1914	.5	65	65	65	.....	Private
Anderson Ditch	D 373	1881	1.5	500.00	1914	1.5	200	150	150	.15	Private
Anderson Ditch No. 2	D 372	1881	.5	$ 300.00	1911	.....	60	.....	.....	.....	
Pomeroy Ditch No. 1	A 723	1903	1.	500.00	1912	.....	80	.....	.....	.....	
Urbach Ditch	D 308	1882	.5	.....	1909	.....	60	.....	.....	.....	
Lyngholm Ditch	D 337	1894	1.	.....	1913	.....	35	10	.....	.....	
Runge Ditch No. 1	D 339	1880	1.	265.00	1914	1.	130	80	100	.....	Private
Runge Ditch No. 2	D 338	1882	.7	240.00	1914	.7	100	30	100	.....	Private
Ficke's Ditch	D 329	1891	1.2	1000.00	1914	1.2	250	110	110	.40	Private
Adams & Tobin	D 368	1878	1.	500.00	1906	.....	140	.....	.....	.....	
Trognitz Canal	D 365	1890	1.2	375.00	1914	.6	150	80	80	.15	Private
Borquist Canal	D 300	1879	.5	1200.00	1914	.5	100	50	50	.40	Private
Borquist Canal	D 301	1887	1.	(3)	1914	1.	100	90	90	.30	Private
Bordwell Ditch	D 302	1875	1.	1025.00	1911	.....	75	.....	.....	.....	

STATUS OF CANALS ALONG THE LODGE POLE CREEK—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Bordwell Ditch	D 303	1873	.7	500.00	1914	.7	150	30	90	.....	Private
Hale Ditch No. 2	D 319	1887	.7	225.00	1910	.....	100	.....	.....	.....	
Hale Ditch No. 1	D 318	1887	.3	300.00	1909	.....	80	.....	.....	.....	
Hale Ditch No. 5	D 322	1883	.3	55.00	c	.....	25	.....	.....	.....	
Hale Ditch No. 3	D 320	1883	.4	200.00	1914	.4	50	20	20	.....	Private
Hale Ditch No. 4	D 321	1883	.4	310.00	1914	.4	80	40	40	.....	Private
Upper Whitney Ditch	D 316	1887	.8	500.00	1914	.8	160	140	140	.....	Private
Whitney Ditch	D 317	1883	1.	600.00	1914	1.	160	140	160	.....	Private
Kreuger Ditch No. 1	D 324	1886	1.	200.00	1914	1.	300	220	220	.10	Private
Krueger Ditch No. 1	A 1301*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Krueger Ditch No. 3	D 323	1884	1.	200.00	1914	1.	200	60	60	.50	Private
Krueger Ditch No. 2	D 325	1885	2.	715.00	1914	2.	320	160	200	.20	Private
Richard Krueger	D 968	1887	1.	200.00	1909	.....	80	.....	.....	.....	
McLaughlin Ditch	A 966	1887	.5	.....	1914	.5	120	100	100	.....	Private
Howard Ditch	D 336	1885	.5	.....	1914	.5	100	40	60	.....	Private
Ruttner Canal	A 906	1908	.6	700.00	1914	.6	70	35	35	.40	Private
Karl Ruttner Ditch	A 1359*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Booth's Ditch	D 309	1883	2.5	1000.00	1914	2.5	310	90	180	.....	Private
Tobin Ditch	D 330	1888	1.0	500.00	1914	1.	170	50	150	.35	Private
F. Dickerson	D 967	1896	1.	500.00	1914	1.	200	80	80	.....	Private
Lehmkuhl	.....	1910	.5	.....	1914	.....	30	30	.....	.....	
F. Dickerson	D 969	1885	.5	200.00	1914	.5	80	80	80	.....	Private
Libby Ditch	D 312	1879	2.	800.00	1914	2.	140	140	140	.....	Private
Oberfelder Ditch	D 333	1876	.5	800.00	1914	.5	40	40	40	.....	Private
Oberfelder Ditch	D 306	1886	.7	600.00	1914	.7	140	140	140	.....	Private
Persinger Ditch	D 297	1889	1.6	500.00	1914	1.6	320	200	200	.....	Private
Bullock Canal	A 437	1898	.6	150.00	1912	.....	70	40	.....	1.00	
W. C. Bullock	D 296	1887	1.	300.00	1909	.....	70	.....	.....	.....	
Wilds Ditch	A 904	1909	.6	.....	1914	.6	120	70	60	.....	Private
Wertz Bros. Ditch	A 600	1897	1.	.....	1914	1.	200	50	50	1.00	Private

STATUS OF CANALS ALONG THE LODGE POLE CREEK—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Wolf Ditch	D 813	1885	.6	200.00	1914	.6	140	70	70	.20	Private
Wiegand Canal	A 563	1899	1.2	500.00	1914	1.2	120	100	100	.....	Private
Wiegand Ditch No. 3	A 1322	1900	.5	250.00	1914	.5	60	30	30	.....	Private
Wiegand Ditch No. 2	A 1323	1914	.....	.....	.....	.....	.....	.....	.....	.....	
McAuliffe Ditch	D 814	1884	1.	100.00	1914	1.	160	60	60	.....	Private
McAuliffe	.....	1911	.7	.....	1914	.7	160	80	80	.....	Private
Johnson Ditch	A 612	1901	.7	300.00	1914	.7	200	160	140	.20	Private
Neuman Ditch	A 611	u	2.	2200.00	1914	2.	580	.....	400	.....	Pumping plant
Ralton	A 847	1907	2.2	$ 2000.00	1914	2.2	700	500	500	.....	Private
Neuman C. S. No. 1 and 2	A 565	.....	.7	.....	1914	.7	130	.....	130	.....	Private
Ralton	A 882	1907	1.	800.00	1914	1.	400	400	400	.....	Private
Soderquist Ditc	A 1237	1913	.5	.....	1914	.5	140	.....	140	.....	Private
Nasland Ditch	A 661	1902	.5	250.00	1914	.5	100	30	60	.....	Private
Smith Ditch	A 850	o	.....	.....	.....	.....	.....	.....	.....	.....	
	Totals	.....	144.5	$ 296794.00	.....	120.9	20891	10010	15164		



VIEWS OF TRI-STATE DIVERSION DAM AND PREVENTING WASH BELOW BY MEANS OF BRUSH MATT AND ROCK

STATUS OF CANALS ALONG THE TRIBUTARIES OF LODGE POLE CREEK

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
SPRING CREEK											
Private Ditch	D 335	†	.....	.....	1913	.....	10	.....	.....	.....	
SPRING BRANCH											
Spring Branch Ditch	A 623	1900	dam	$ 100.00	1914	.....	.....	.....	.....	.....	The dam simply sub-
SPRING CREEK											[irrigates
Oberfelder Ditch	D 307	1876	1.5	3000.00	1914	1.5	160	80	150	.....	Private
Oberfelder	.....	1885	2 da	ms 400.00	1914	.....	.....	.....	.....	.....	Dams sub-irrigate some
											[land
	Totals	.....	1.5	$ 3500.00	.....	1.5	160	80	150	.....	
DRY DRAW											
Fifield Ditch	A 1091	†	.....	.....	1912	.....	.....	.....	39	.....	

* Water right pending.
† No further information available.
✦ Maintenance and Operation.
o No construction work done.
(1) All data included under ditch A727.
(2) Water for original lands diverted through the Kinney and New Ruttner ditches.
c Ditch not used for years.
d An additional water for ditch (number).
e An extension to ditch (number).
u Still under construction.
(3) Cost of D301 included with cost of D300.

SUMMARY OF CANALS IN SOUTH PLATTE DRAINAGE BASIN

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
SOUTH PLATTE RIVER	17	104.6	33,332	$ 96,825	4	39.5	20,492	9,200	17,318
Fremont Slough	1	3.4	500	592	.....	.....	.....	.....	.....
Lodge Pole Creek	88	144.5	20,891	296,794	70	120.9	19,695	10,010	15,164
Tributaries of Lodge Pole Creek:									
Spring Creek	1	.....	10	.....	.....	.....	.....	.....	.....
Spring Branch	dam	.....	.....	100	.....	.....	.....	.....	.....
Spring Creek	1	1.5	160	3,400	1	1.5	160	80	150
Total	108	254.0	54,893	$ 397,711	75	161.9	40,347	19,290	32,632

IRRIGATION IN THE PLATTE RIVER DRAINAGE BASIN

The first irrigation enterprise undertaken within the state was located within this valley. In 1866 John Burke built a canal at Fort McPherson, about 16 miles east of the present site of North Platte, and raised vegetables which were sold to the fort. The Kearney Water and Electric Power Company built a canal and a power plant in 1882, and while this was not built as an irrigation plant, water was rented to the farmers residing under the canal during later years. No further attempts were made at irrigation until the early nineties, when irrigation enterprises, mostly of a gigantic order, were promoted. These enterprises proposed to irrigate nearly every foot of the valley between the head of the river, just east of the town of North Platte, and the territory lying to the east of Kearney. It was during this time that most of the canals along the river were built.

There are twenty-two existing appropriations from the river, totaling 4,703.72 second-feet. Of this number all but six either have been completely abandoned or have not been used for years.

Twenty canals were built prior to 1899 at a cost of $367,424, and a maximum of 30,000 acres were irrigated at one time. The dry period in the early nineties was followed by a period in which fair crops could be raised in average years. The result was that no new contracts could be made, and the farmers who had contracted for water refused to pay the maintenance and operation charges. Nearly all the canals were owned by stock companies in which the landowners owned no stock, and as the canals did not produce any revenue the companies were forced into bankruptcy and the canals finally were abandoned. In addition, many farmers have become prosperous without irrigation.

The following statement shows the extent to which irrigation enterprises within this valley have been abandoned:

SUMMARY OF CANALS IN THE PLATTE RIVER VALLEY

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
PLATTE RIVER	20	226.6	221,800	$ 367,424	6	100	152,200	9,000	29,671
White Horse Creek	2	.....	802	.....	2	.....	.....	.....	802
Pawnee Creek	3	5.5	1,400	3,715	1	3	720	700	700
Buffalo Creek	1	1.5	60	750	.....	.....	.....	.....	.....
Wood River	1	.....	115	.....	1	.....	115	.....	115
Total	27	233.6	224,177	$ 371,889	10	103	153,035	9,700	31,288

The American Beet Sugar Company has a factory at Grand Island. During the season of 1912, 36,000 tons of beets were delivered to this factory. Thirty-five thousand tons were delivered in 1913, and the quantity that will be delivered in 1914 is estimated as 42,000 tons. Some of the beets are shipped from as far as Hitchcock county in the southwest corner of the state. Under the present contracts, a flat rate of $5 per ton is paid for the beets.

CANALS ALONG THE PLATTE RIVER

LINCOLN AND DAWSON COUNTIES IRRIGATION DISTRICT (D-687). The Lincoln and Dawson Counties Irrigation District was organized in 1895. The enterprise proposed to divert water from the river about six miles east of the town of North Platte and deliver it to land lying north of Gothenburg, by constructing a canal 40 miles long through the sand-hill country to the north of the river. The estimated cost of construction of the project was $275,000. The district voted bonds to that amount but they never were issued. Some five miles of canal were opened up at the lower end and an expense of $11,000 was incurred. This amount was later raised by an assessment and the district was dissolved. The project was not feasible on account of the necessity of carrying the water the great distance through the sand-hills before any beneficial use could have been made.

GOTHENBURG SOUTH SIDE IRRIGATION COMPANY (D-681). The Gothenburg South Side Irrigation Company was organized with a capital stock of $40,000, on November 9, 1894, and started with a paid-up capital of $12,000. Construction work was begun in 1894 and during that and the next year 15 miles of canal were completed at a cost of $20,000. The work was done largely by contract, but farmers who purchased water rights were allowed to work out a portion of the same. Water rights for 1,200 acres were sold at $5 each in work and cash. Water was run through the canal in the latter part of 1895, and a small acreage was irrigated. A maximum of 800 acres was irrigated during the next few years. A maintenance charge of 50 cents per acre was charged those holding water rights. Water was rented also at the rate of $1.50 per acre per season. The farmers were slow to purchase water rights as they relied upon the privilege of renting water during a dry season. As sufficient rain for the growing crops fell during the following years, those holding water rights would not use the water, and refused to pay the annual maintenance charge. With no income, the company was forced into bankruptcy and the canal was sold. The canal has been completely abandoned and no attempt has been made to run water through it during the last twelve years.

GOTHENBURG POWER AND IRRIGATION COMPANY (D-645). The Gothenburg Power and Irrigation Company built a canal 10 miles long, a storage lake covering 25 acres, and a power plant at Gothenburg during the years 1890-91. The Gothenburg Light and Power Company

has since acquired this property. The Gothenburg Irrigation Company, a subsidiary, was incorporated with a capital stock of $30,000, and extended the canal east from the lake for a distance of 20 miles. Approximately 10 miles of distributing laterals were built. This system was capable of irrigating 12,000 acres and cost approximately $25,000. Water rights are sold for $10 per acre, with a fixed annual maintenance charge of 50 cents per acre. Water also is rented for the season at $1.50 per acre-foot. During the season of 1914 about 4,820 acres were irrigated. There are 17½ miles of main canal and laterals in operation at present.

FARMERS AND MERCHANTS CANAL (D-622). The Farmers and Merchants Irrigation Company was incorporated in 1894, with a capital stock of $25,000. Construction work was begun in August, 1894, and by December the company was in debt $15,000. The company was re-organized with a paid-up capital stock of $64,000, and the work of construction was pushed forward during the years 1895-96. Thirty-two miles of main canal and about 50 miles of distributing laterals were completed. This company never issued any bonds, but it borrowed $30,000 and gave a mortgage on the canal as security. One precinct of Dawson county voted and issued $17,000 in bonds to aid the construction. The cost of the entire system was approximately $110,000. At first water rights were sold at $5 per acre, then were reduced to $3.50, and finally raised to $8. The maintenance and operation charge was fixed at 50 cents per acre. Water rights for 8,000 acres were sold. This system was built to water 80,000 acres. The company finally became financially involved, foreclosure proceedings followed, and the canal was sold in 1913. Owing to the pending litigation and the non-use of the canal, the company was unable to maintain the bridges on the county roads. The county refused to maintain these bridges and issued orders to the road supervisors to tear up the bridges and fill in the ditch. For a number of years the road crossing six miles east of Cozad was filled in.

The Dawson County Irrigation Company was organized in September 1913, with $5,000 common stock, and $25,000 preferred stock, of which the former was all paid in. This company purchased the canal system, and during the fall of 1913 and spring of 1914 re-constructed the system, replaced worn-out structures, built bridges across the roads, and reopened the canal. During the season of 1914 water was run through about 60 miles of main canal and laterals. The company is willing to recognize all old water rights, provided all back maintenance and operation charges are paid in full and some of the old rights have taken advantage of this policy. Water rights are now sold as follows: Ten dollars per acre, with annual maintenance and operation charge of $1 per acre, or $5 per acre with an annual maintenance and operation charge of $1.50 per acre, this charge to be reduced 10 cents per acre for every 10,000 acres sold until the charge is $1 per acre.

The following tables show the status of the canals along the Platte river and its tributaries:

STATUS OF CANALS ALONG THE PLATTE RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912		
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914			
Farmers D. and Canal Co.	D 666	1894	38.	$ 25000.00	s	.....	19000	.....	.....	.....	.....	
Lincoln & Dawson C's.	D 687	1895	5.	11000.00	s	.....	.....	.....	.....	.....	.....	
Appleford Canal	D 674	1894	3.	4000.00	1902	.....	1000	.....	.....	.....	.....	
Appleford Canal	D 690	1895	1.5	z	.....	.....	.....	.....	.....	.....	.....	
Maxwell Canal	D 673	1898	5.	10000.00	1914	5.	2500	500	.....	.....	.....	Private
Maxwell Canal	A 1118*	.....	.....	.....	.....	.....	.....	.....	720	.....	.....	d- D673
McCullough Ditch	D 679	1895	4.5	3000.00	c	.....	2100	.....	.....	.....	.....	
Gothenburg S. S. I. Co.	D 681	1894-5	15.	20000.00	1902	.....	12000	.....	.....	.....	.....	
Gothenburg P. & I. Co.	D 645b	1894	26.	25000.00	1914	26.	30000	5000	4821	$ 2.00	$ 1.50	Corporation
Six Mile Ditch	D 680	1895	7.5	3600.00	1914	5.	1700	.....	1610	.....	.....	
Booker Canal	D 625	1894	1.3	300.00	1897	.....	300	.....	.....	.....	.....	
Cozad Canal	D 626	1895	21.	97500.00	1914	16.	28000	1000	19260	2.00	.....	Corporation
Orchard and Alfalfa	D 627	1896	16.	20000.00	1906	.....	15000	.....	.....	.....	.....	
South Side Irr. Co.	A 1328*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	y
Farmers & Merchants	D 622	1894-6	32.	110000.00	1914	32.	86000	1000	.....	.....	1.50	Corporation
Farmers Irr. Co.	D 621	1895	6	4500.00	1900	.....	1600	.....	.....	.....	.....	
Lexington S. S. Ditch	A 576	.....	10.	.....	1905	.....	2000	.....	.....	.....	.....	
Platte R. I. Co. Canal	D 624	1896	1.3	3668.00	1898	.....	700	.....	.....	.....	.....	
Farmers Union Canal	D 623	1894	11.	13816.00	1898	.....	13000	.....	.....	.....	.....	
Kearney W. & E. P. Co.	D1023	1882-3	16.	.....	1914	16.	10000	1500	3260	2.50	.....	Corporation
Farmers Canal	D 628	1894-5	3.5	15000.00	1897	.....	2500	.....	.....	.....	.....	
Leroy Sides	D 629	.....	3.	1040.00	c	.....	400	.....	.....	.....	.....	Obliterated
	Totals	.....	226 6	$ 367424.00	.....	100.0	221800	9000	29671	.....	.....	

c Ditch not used for years.
s No water ever diverted.
* ..ater right pending.
d- An additional water right for ditch (number).
r Was built as a power plant and irrigation is a secondary consideration.
z Ditch built upon an island and had two headgates for the ditch.
y A new filing to open up the old Orchard and Alfalfa ditch. ✦ Maintenance and Operation.

STATUS OF CANALS ALONG THE TRIBUTARIES OF THE PLATTE RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
WHITE HORSE CREEK											
Lamplaugh's Lake	D 658	.....	.....	.....	1914	.....	410	.....	410	.....	
Jno. Bratt Ditch	A 1316	.....	.....	.....	1914	.....	392	.....	392	.....	
PAWNEE CREEK											
Holcomb's Ditch	D 636	1890	3.	$ 3000.00	1914	3.	720	700	700	$ .55	Private
Plumer Ditch	D 672	1897	1.	100.00	1899	.....	360	.....	.....	.....	
Janssen's Canal	A 1365*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Murphy Ditch	D 669	1897	1.5	615.00	1899	.....	320	.....	.....	.....	
	Totals	.....	5.5	$ 3715.00	.....	3.	1400	700	700	.....	
BUFFALO CREEK											
Henry Canal	A 570	1900	1.5	$ 750.00	1901	.....	60	.....	.....	.....	
WOOD RIVER											
Wood River	A 1286	.....	.....	.....	.....	.....	.....	.....	.....	.....	
C. A. Jacobson Canal	A 1038	o	.....	.....	.....	.....	.....	.....	.....	.....	
White Bridge Park	A 545a	o	.....	.....	.....	.....	.....	.....	.....	.....	
Kimbrough Canal	A 1227	.....	.....	.....	1914	.....	115	.....	115	.....	

* Water right pending.
o No construction work done.
† No further information available.
✦ Maintenance and Operation.

BUILDING PERMANENT ROADS IN DODGE COUNTY

IRRIGATION IN THE REPUBLICAN RIVER DRAINAGE BASIN

The irrigated area within this valley consists of a narrow strip broken by unirrigated gaps, that extends on both sides of the river from the state line eastward to the vicinity of McCook. No water is diverted, however, from the river east of the vicinity of Culbertson. The first irrigation enterprise from the river itself was a small ditch built in the vicinity of McCook by Andrew Carson in 1888, but the Phelan Ditch, built in 1882, was the first ditch within the drainage basin of the river. All the canals along the river were built during the dry years of 1888 to 1896, with the exception of the Rupert ditch, which is now being built by a mutual stock company composed of farmers residing in the vicinity of Trenton.

Canals Along the Republican River

There are forty existing appropriations from the river, totaling over 982.79 second-feet. Of this number sixteen either have been abandoned or have not been used for a number of years; no construction work has been done upon two; two have been sold and transferred to another canal; one is under construction; and one is used for creating an ice pond. No data could be obtained regarding seven of the appropriations.

The banks of the river are low, but the bed of the stream is composed of a shifting quicksand which makes it costly to construct a permanent dam. Usually the farmers simply construct dams of brush and straw across the river when the flow becomes low.

Twenty-five canals have been built along the river, but only nine of these were operated during 1914. Of this number three were operated as private ditches, one by a corporation, two by mutual stock companies, and one as a partnership ditch. One hundred and sixty-four and one-tenth miles of canal have been built, but only 62 miles were in operation in 1914, and out of 41,640 acres which lie below the canals as constructed, only 23,140 acres were irrigable from the canals in operation in 1914.

One of the main lines of the Chicago, Burlington & Quincy railroad traverses this valley, and the railway facilities to Denver and eastern markets are good.

HAIGLER LAND AND CANAL COMPANY (D-1025). The Colorado and Nebraska Farmers Company was organized by farmers and made a survey for a canal which would tap the North fork of the Republican river in Colorado and irrigate a body of land lying on the south side of the stream in both Colorado and Nebraska.

The Haigler Land and Canal Company was organized with a capital stock of $50,000. This company acquired the rights of the Colorado and Nebraska Farmers Company, and in 1890 re-surveys were made and a canal was built to Arickaree creek, a distance of 14 miles. Here the canal divided, one branch turning up the valley for a short distance and the other flumed across the creek. The flume was 4,000 feet long, had a maximum height of 48 feet, and cost $8,000. This flume was hard to

maintain. It was blown down by high wind, rebuilt, and then struck by lightning and burned and never rebuilt. There are 6,470 acres of irrigable land lying below the canal, 1,050 of which are located in Colorado. During 1912, 85 per cent of this acreage was under cultivation. The company was adjudicated, 15 second-feet of water by Colorado for the acreage lying within that state and 77 second-feet by Nebraska for the acreage lying in that state.

Water rights for 1 second-foot have been sold for $400 cash. The water supply is good except during the hot months of July and August.

The Haigler Land and Canal Company built a second canal on the south side of Arickaree creek in 1892. This canal taps the creek in Colorado, and extends down the valley 21 miles. It is 60 feet lower than the canal built from the North Fork of the Republican river. Arickaree creek has no normal flow, but it was the intention to supplement what flow there is with the supply brought from the north fork of the Republican river. After the destruction of the flume by lightning, the canal on the south side of the creek was abandoned.

The company also built a third canal known as the North Side Ditch, on the north side of the north fork of the Republican river. The headgates were located in Colorado and the canal was built through a very sandy country for a distance of 18 miles at a cost of $8,000. On account of the sandy country traversed, no irrigation was ever attempted and the canal was abandoned.

The cost of construction of the three canals was $50,000, and only the first mentioned is in operation at present. Corn, sugar beets and alfalfa are the principal crops grown under this canal.

DUNDY COUNTY DITCH (D-118). The Dundy County Irrigation Company was organized in 1890, and 21 shares, with a par value of $500 were subscribed by the water users. Each share represented the right to 1 second-foot of water. The company posted a notice of appropriation on November 22, 1890, at a point on the north bank of the stream in Section 24, Township 1 north, Range 39 west. Construction was begun immediately and during 1891, eleven miles of canal were built, the work being done almost entirely by the stockholders. The cost of the canal was $4,500, of which $1,500 was spent in the construction of headgates and three flumes. The company extended the canal 2¼ miles in 1894 at a cost of $700. During the first five years of operation the cost of maintenance almost equalled the first cost of the canal, and the two lower flumes were allowed to become dilapidated. At the present time only six miles of canal, including the upper flume, are in operation. On account of the shifting sands of the river bed the company does not attempt to maintain a dam across the river, but when the flow becomes low they construct a temporary dam of brush and straw. The average cost of maintenance is about $300 per year.

REPUBLICAN RIVER IRRIGATION DITCH (D-147). The Republican River Irrigation Company was organized in 1894, with a capital stock of $2,000, consisting of twenty shares, all of which were subscribed for by the landowners under the proposed ditch. The stockholders built eight miles of ditch during 1894 at a cost of $2,500. A maximum irrigated area of 600 acres was attained during the next few years. The ownership of this canal has changed often and the owners never have kept the ditch in repair or attempted to operate it to any great extent. It was last operated during the season of 1909.

DELAWARE-HICKMAN DITCH (D-157). The Delaware-Hickman Ditch Company was organized in 1895 with a capital stock of $5,000. The company posted a notice of appropriation on the south bank of the river in Section 17, Township 1 north, Range 37 west, on January 7, 1895, and during that year eight miles of canal were built at a cost of $5,000. This ditch has not been operated every year, but the upper four miles has been kept in repair so that it could be used during a dry year. The cost of keeping the ditch in this condition is about $100 per year. The greater portion of the expense is caused by the shifting sands of the river at the headgates. There are about 1,400 acres lying below the canal, but only 940 acres can be irrigated from the portion kept in repair.

TRENTON FARMERS DITCH (D-5; A-1055). The farmers under the ditch organized the Trenton Farmers Irrigation Association in 1894, and during that fall built eight miles of canal at a cost of $4,525. Water never was conveyed farther than six miles, as a flume at that point was never built. On account of the shortage of the water supply in the river, the farmers became discouraged and abandoned the ditch. During the past few years the land under this canal has changed hands and a new application has been made for a water right. The old right of way has been taken possession of, and the upper six miles have been cleaned at a cost of $4,700. There are 1,100 acres below the ditch, but only 335 acres were irrigated this past season.

MEEKER CANAL (D-4, 7, 8, 9). The Meeker canal heads on the south bank of the river just below the mouth of Frenchman river, east of Culbertson. Nineteen miles of canal were built during the year 1891-92. Two precincts of Red Willow county voted and issued $10,000 in bonds to aid the construction. The balance of the money for the construction was raised by the builders on personal notes.

In 1893 the McCook Irrigation and Water Power Company was organized with a capital stock of $50,000, and took over the canal. The company extended the canal 3½ miles, but this portion was later abandoned, on account of the excessive cost of maintenance. The company purchased the Carson ditches, Nos. 1 and 2, holding prior rights and abandoned them, transferring the water rights to the Meeker canal. The cost of construction of the system was $50,000.

Water rights for 160 acres were formerly sold for $2,000, but the price has been advanced to $35 an acre. In addition, there is an annual maintainence charge of $1 per acre. There are paid-up water rights for 2,400 acres under the canal. Water is rented to non-holders of water rights. At first the rental was $1 per acre, but it has been advanced to $2, $3 and finally to $3.50 per acree in 1912. There are 10,000 acres lying below this canal and 3,950 acres were irrigated during 1911, 4,200 acres during 1912, and 2,561 acres during 1914. The principal crops raised are alfalfa, sugar beets, corn, wheat and potatoes.

CAMBRIDGE AND ARAPAHOE IRRIGATION AND IMPROVEMENT COMPANY CANAL (D-89). Construction on this canal was begun in the latter part of 1891. The company was organized, eastern parties holding the stock and bonds, and acquired the rights to the canal. Construction work was prosecuted continuously until 1894, when 16 miles of canal had been completed at a cost of $30,000.

The canal was operated for a period of seven years, and during that time a maximum acreage of 700 acres, out of the 12,000 acres lying below the canal, was irrigated.

This canal has been completely abandoned. The chief difficulties encountered were: The river is usually dry during the hot months of summer and no water supply can be depended on, and the topography of the country traversed was unfavorable to the construction, maintenance and operation of the canal. The country crossed by the canal is cut by numerous deep canyons which had to be crossed by flumes or fills. Heavy rains upon the uplands caused floods down the canyons and where the canal was built across, these floods either would fill the canal with sedimentary wash from the hillsides, or would wash out the fills.

The following table shows the status of the canals along the Republican river:

STATUS OF CANALS ALONG THE REPUBLICAN RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Haigler L. & C. Co.	D1025*	1890	14.	$ 42000.00	1914	14.	6740	4000	.....	.....	Corporation
Haigler L. & C. Co.	.....	1890	21.	g	1895	.....	.....	.....	.....	.....	
Haigler L. & C. Co.	.....	1890	18.	8000.00	.....	.....	.....	.....	.....	.....	
Haigler R. & I. Co.	A 979	o	.....	.....	.....	.....	.....	.....	.....	.....	
Haigler Res. No. 2	A 997	o	.....	.....	.....	.....	.....	.....	.....	.....	
White & Larned	D 150	1893	2.	300.00	1909	.....	200	.....	.....	.....	
Thomas Ditch	D 154	1894–5	1.2	300.00	k	.....	.....	.....	.....	.....	
Private Ditch	A 413	1892	2.	300.00	1911	.....	200	.....	.....	.....	
Parks Ditch	A 1202	†	.....	.....	.....	.....	.....	.....	.....	.....	
Dundy County Ditch	D 118	1890–1	13.2	5200.00	1914	.6	1900	100	.....	$ 3.00	Mutual Stock Co.
Neighbor Ditch	D 133	1894	2.5	300.00	1914	2.	200	60	.....	.....	Private
Republican R. I. Co.	D 147	1894	8.	2500.00	1909	.....	2000	.....	.....	.....	
Republican R. I. Co.	D 148	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D147
Republican R. I. Co.	A 577	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D147
Delaware-Hickman	D 157	1895	8.	5000.00	1914	4.	1400	100	.....	1.00	Mutual Stock Co.
Groesbeck Ditch	D 153	1894–5	3.	1500.00	1900	.....	700	.....	.....	.....	
Anders Anderson	D 151	1894	1.3	150.00	1914	.5	140	40	35	.....	Private
Cottonwood Ditch	A 1172	†	.....	.....	1914	.....	.....	.....	.....	.....	
H. D. Irrigation Canal	A 1068	†	.....	.....	.....	.....	.....	.....	.....	.....	
Campbell Ditch	A 828	1906	2.2	1000.00	1911	.....	600	.....	417	.....	
Trenton Farmers	D 5	1894	8.	4525.00	1897	.....	.....	.....	.....	.....	
McConnell B. I. Co.	A 1055	p	.....	4700.00	1914	6.	1100	300	335	.....	Private
Rupert Ditch	A 1192	1911	8.	10000.00	1914	8.	1400	.....	1400	.....	
Trites-Davenport	D 3	1890	2.5	3000.00	1914	2.5	530	25	240	.....	Partnership
Marr Ditch	D 11	1891	1.	700.00	1908	.....	600	.....	.....	.....	
Meeker Canal	D 4	1891–3	22.5	50000.00	1914	19.	10000	4000	2561	3.50	Corporation
Meeker Canal	D 7	d- D4	.....	.....	.....	.....	.....	.....	.....	.....	
Meeker Canal	D 8	d- D4	.....	.....	.....	.....	.....	.....	.....	.....	
Meeker Canal	D 9	d- D4	.....	.....	.....	.....	.....	.....	.....	.....	
Geo. Chappell	A 1093	†	.....	.....	.....	.....	.....	.....	.....	.....	

STATUS OF CANALS ALONG THE REPUBLICAN RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Carsen Ditch No. 2	D 102	1890-1	.5	325.00	1899	.....	1000	.....	.....	.....	
Carson Ditch No. 1	D 103	1888	1.	700.00	1899	.....	100	.....	.....	.....	
P. Walsh	A 537	Δ	.....	.....	.....	.....	.....	.....	.....	.....	
Wilcox Ditch	D 109	1894	1.5	400.00	1895	.....	200	.....	.....	.....	
Shadeland Park	A 1049	†	.....	.....	.....	.....	.....	.....	.....	.....	
Byfield Ditch	D 108	1894	1.2	1875.00	1895	.....	300	.....	.....	.....	Cancelled
Shadeland Park	A 1129	†	.....	.....	.....	.....	.....	.....	.....	.....	
Allen Irrigation Ditch	D 110	1895	3.	1204.00	1895	.....	300	.....	.....	.....	
Cambridge & A. I. Co	D 89	1891-4	16.	30000.00	1901	.....	12000	.....	.....	.....	
Ballard Ditch	D 91	1894	2.5	2019.00	1896	.....	300	.....	.....	.....	
W. J. Bailey	A 1321	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Askey Irrigation Ditch	A 1317*	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Totals	.....	164.1	$ 175998.00	.....	62.0	41640	8625	4988	.....	

d- An additional water right for ditch (number).
g Cost included in the line above.
* Water right pending.
o No construction work done.
Δ Used for ice and no irrigation practiced at the present time.
✦ Maintenance and Operation.
k Ditch washed out before any irrigation was accomplished.
p A new application to reopen the Trenton Farmers which had been abandoned.
† No further information available.

CANALS FROM THE FRENCHMAN RIVER

The most important irrigated section of the valley is between Palisade and the mouth of the river, the irrigated area in the upper part of the valley being in scattered tracts. The soil within the valley is of an alluvial deposit and is very fertile and productive.

Two irrigation enterprises, the Harlem and the Aberdeen ditches, were completed during 1887. These ditches were both located in the upper section of the valley. The Culbertson canal, the largest enterprise within the valley, was the first enterprise undertaken in the lower section of the valley.

There are 38 existing appropriations from the river, totaling 430.53 second-feet. Six of the appropriations either have been abandoned or have not been used for a number of years; ten were merely for extensions or enlargements of existing ditches; and no construction has been done on two. Data could not be obtained regarding five of the appropriations.

The banks of the river are low and in the upper section of the valley the river bed either is rock or a course gravel, while in the lower section the bed is a fine sand formation. Ordinary dams are hard to maintain in the lower section, but this difficulty has been overcome in a number of cases by constructing dams large enough to divert the entire flow, all the water being run through the upper portion of the canal and the excess wasted back into the old channel.

There have been 17 canals built along the river, but only 14 of these were in operation during 1914. The principal crops grown under irrigation are alfalfa, sugar beets, wheat, corn and potatoes.

During 1914 nearly 2,000 acres located in the lower section of the valley were planted to sugar beets. The Chicago, Burlington & Quincy railroad has a branch line extending up this valley, and the railway facilities are fairly good.

MARANVILLE DITCH (D-70-71). This ditch is 4½ miles long and was built in 1895 at a cost of $5,000 by three partners. The canal heads about 9 or 10 miles west of Champion. There are 480 acres lying below this ditch and this acreage is usually irrigated each season. It is planted to alfalfa and grain.

INMAN DITCH (D-791; A-436). Two and one-half miles of this ditch were built as a private ditch in 1895. In January, 1896, the Inman Ditch and Irrigation Company was organized with a capital stock of $1,450, and the ditch purchased. Each share represented the water right to 10 acres, and had a par value of $25. The ditch was extended 4½ miles at a cost of $2,700, or about $1,250 more than was at first anticipated. This deficiency was raised by the shareholders who contributed according to the number of shares held. There are 780 acres lying below this ditch, but water rights for only 461 acres have been granted and 450 acres were irrigated during 1914. Each shareholder does his pro-

portionate share of cleaning the ditch. In addition, the land is assessed 25 cents an acre to pay for a ditch rider during the irrigating season.

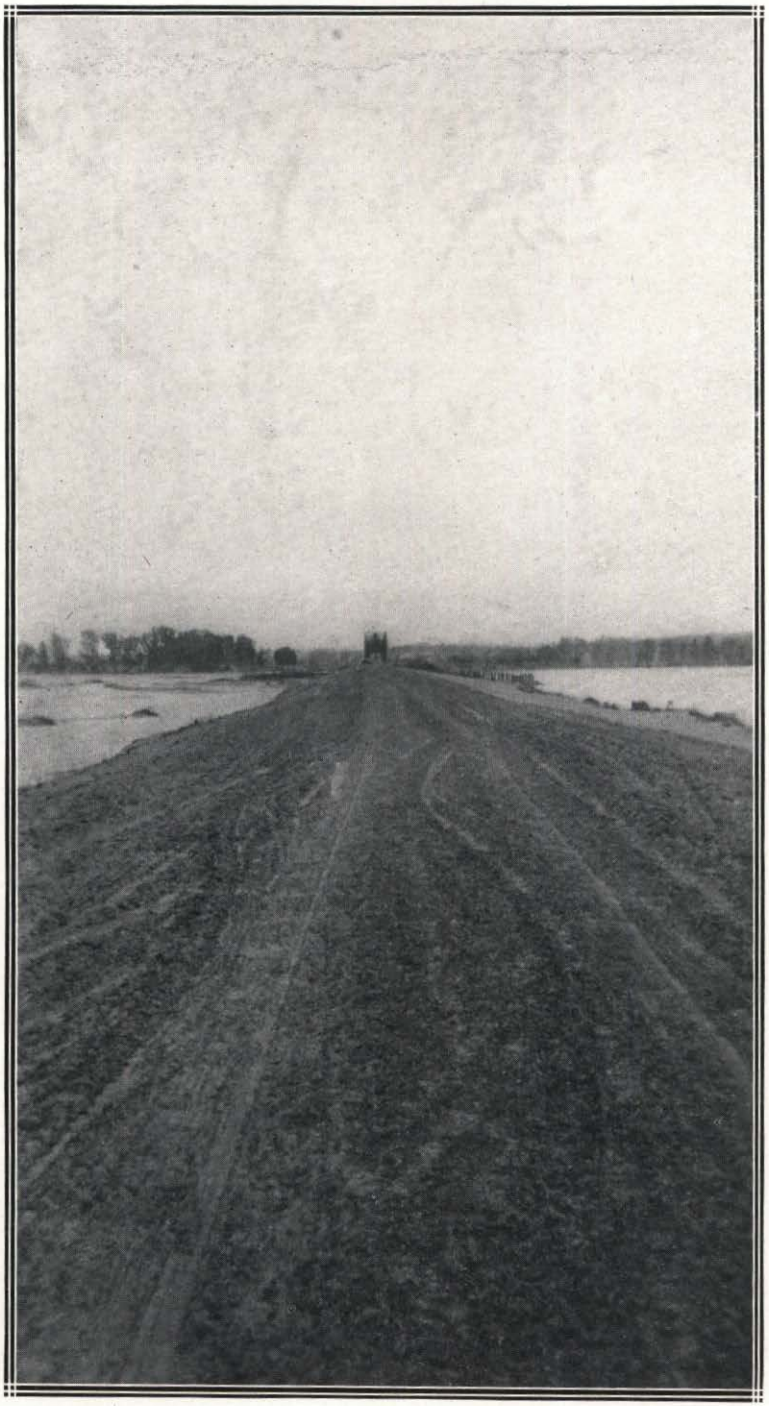
CHAMPION WATER POWER AND IRRIGATION DITCH (D-47). This ditch is seven miles long and was constructed in 1891 with $4,500 donated by Champion precinct of Chase county. The ditch was found to have too small a capacity, and was enlarged by an individual at a cost of $3,000. Later it was sold for $5,800. It has been extended three miles and now covers some 2,700 acres, the greater portion of which was irrigated in 1914.

FULLER DITCH (D-62). This ditch was built in 1894. It headed about two miles above Wauneta and was 6½ miles long. It was intended to irrigate 1,750 of the 2,000 acres lying below the ditch. The first cost of construction was $5,000, and an additional $5,000 was spent during the next ten years trying to operate and maintain it. Water was run to within 1½ miles of the end, but the activity of the gophers caused washout after washout, and the ditch finally was abandoned.

FOLLETT AND KROTTER DITCH (A-705, 720, 975). Four miles of ditch were built in 1903. A power plant was built some distance below the headgates and the entire flow of the river is diverted through the canal to this point. All water not used for irrigation passes through the power plant and is returned to the river channel. The irrigation system cost $8,000, and covers 850 acres. In addition, power is used for pumping water to 250 acres. About 900 of the 1,100 acres under ditch were irrigated during 1914.

FRENCHMAN VALLEY IRRIGATION DISTRICT (D-24, 25, 29, 30). Thirty-three miles of the Culbertson canal were built by small contracts during the years 1890-94 at a cost of $146,881. The canal heads north of Palisade and the entire flow of the river is diverted by a dam and carried through the first mile of the canal. At this point the canal crosses over Stinking Water creek in a combination flume and wasteway which in reality is the headgates of the canal. Stinking Water creek flows along the east side of the valley of the Frenchman river. The bench on the east side of the creek rises rapidly and the west bank of the creek has been raised to the same elevation as that of the canal. The headgate structure is so constructed that the bed of the canal is some six or eight feet above the sill of the waste gates, which are on the same level as the bed of the creek. The flow in the canal is regulated by means of two wooden radial waste gates. When the gates are open the water returns to the river through the creek; when they are closed the flows of the river and creek pass down the canal.

From the headgates the canal gradually climbs the bluffs bordering the river valley, and finally emerges upon the table about four miles northwest of Culbertson. Within the stretch of territory between the headgate and a point a short distance beyond where the canal emerges upon the table, there are nine deep canyons. Formerly all of these were



VIEW SHOWING CLAY GRAVEL ROAD BUILDING ON TOP OF SAND FILL TO FREMONT STATE AID BRIDGE

crossed by wooden flumes. Later the canal was built around the heads of two of these canyons and the other seven flumes have been replaced by inverted steel siphons ranging in size from 72 to 48 inches in diameter and from 230 to 1,056 feet in length.

Until 1912 the canal was owned by an eastern man. No water rights were sold, water being rented for the season on a graduated scale. the prices per acre being as follows: Spring grains, $2; alfalfa, $2.50; sugar beets, $3.50; corn, one flooding, $2; fall grains, fall irrigation, $1.50; fall grains, spring irrigation, $2 and potatoes, 3. Annual contracts were drawn in which the kinds of crops to be raised and the number of times to be irrigated were specified.

A petition signed by 59 landowners was presented to the county commissioners of Hitchcock county, praying for the organization of an irrigation district. On January 15, 1912, the commissioners approved the petition and called an election for February 12. Later the commissioners declared the district duly organized, with an area of 9,730 acres. On August 6 bonds in the sum of $150,000 were voted, of which $90,000 were paid for the canal and the remaining $60,000 were to be expended in betterments and improvements. One hundred and forty-one thousand dollars' worth of the bonds were sold at par and the other $9,000 at 95 per cent. The district has completed a filing for a reservoir site on the Frenchman river for the construction of which $20,000 of the original bonds were to be used. A modern concrete structure costing $5,000 has been built to replace the old wooden headgate.

For the purpose of levying assessments the lands are assessed upon valuations of $11, $13 and $15 per acre. The assessments in 1914 were 91 mills for maintenance and operation and 67 mills to cover interest on bonds, making the cost per acre for water as follows:

Land Valuation	Operation and Maintenance	Bonds and Interest	Total
$11	$1.001	$ .737	$1.738
13	1.183	.871	2.054
15	1.365	1.005	2.370

Nine thousand five hundred and sixty-eight acres were taxed in 1914. The principal crops raised are sugar beets, alfalfa, small grains and potatoes.

RIVERSIDE CANAL (D-18). The farmers under this canal attempted to form a company—the Riverside Canal and Irrigation Company—but the organization was never perfected, and they have operated the canal under a mutual agreement whereby each acre constitutes a share. Six and one-half miles of canal were built in 1894, and an extension of one mile in 1897, the entire cost of construction being $3,000. The canal was built somewhat upon the plans followed in the construction of the Culbertson canal. The entire flow of the river is diverted by a dam about three miles east of Beverly, and conducted through a new

channel for about three-fourths of a mile, at which point the headgates and waste gates are located. The excess water is here wasted back into the old channel of the river. This canal covers 1,200 acres lying in the valley, of which 694 acres were irrigated in 1914. All operation charges are assessed upon the land represented in the agreemnt. The charge for 1912 was 40 cents per acre. The principal crops raised are alfalfa, sugar beets, wheat and potatoes. The parties under this canal have attempted to form an irrigation district, but so far no organization has been consumated.

FARMERS CANAL (D-10). This ditch was started as a private enterprise in 1893. In 1904 the Farmers Canal Company was organized with a capital stock of $10,000, and the stock divided among farmer owners and their wives. During that year a canal five miles long was built at a cost of $4,000. This canal heads about four miles above Culbertson, and covers 709 acres of land, all of which is usually irrigated each season. The cost of maintenance and operation is about $300 per year, or about 42 cents per acre. The acreage under this canal is planted to alfalfa, potatoes, sugar beets and small grains.

The following table shows the status of canals along the Frenchman river, its tributaries and other tributaries of the Republican river:

STATUS OF CANALS ALONG FRENCHMAN RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Arterburn Res.	A 1142	†	.....	.....	.....	.....	.....	.....	.....	.....	
Maranville Ditch	D 70	1895	4.5	$ 5000.00	1914	4.5	480	405	480	.....	Partnership
Maranville Ditch	D 71	d-D70	.....	.....	.....	.....	.....	.....	.....	.....	
Inman Reservoir	A 1145	o	.....	.....	.....	.....	.....	.....	.....	.....	
Inman Ditch	D 79	1895-6	7.	3150.00	1914	7.	780	461	450	.25	Mutual Stock Co.
Inman Ditch	A 436	d-D79	.....	.....	.....	.....	.....	.....	.....	.....	
Kilpatrick Res. 1	A 1108	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Kilpatrick Res. Ditch	A 1160	†	.....	.....	1914	.....	1349	.....	1349	.....	
Champion W. P & I. Ditch	D 47	1891	10.	8500.00	1914	10.	2709	1000	2709	1.50	Private
North Side Irrigation Ditch	A 246	1894	1.3	300.00	1914	1.3	95	.....	95	.....	
Hokes P. and P. Plant	A 1094	†	.....	.....	1914	.....	19	.....	19	.....	
Shallenberger Canal	A 423	1889	.7	300.00	1914	.7	125	.....	124	.....	
Aberdeen Ditch	D 50	1887	2.	1600.00	1914	2.	307	.....	307	.....	
Aberdeen Ditch	D 68	d-D50	.....	.....	.....	.....	.....	.....	.....	.....	
Extension Aberdeen Canal	A 1117	d-D68	.....	.....	.....	.....	.....	.....	.....	.....	
Harvey Reservoir	A 1304	†	.....	.....	.....	.....	.....	.....	.....	.....	
Harlem Ditch	D 56	1887	5.7	5000.00	1914	4.	290	.....	241	.....	
Harlem Ditch	D 67	d-D56	.....	.....	.....	.....	.....	.....	.....	.....	
North Side Guernsey Ditch	D 74	1893	1.5	2000.00	1909	.....	300	.....	80	.....	
South Side Guernsey Ditch	D 75	1897	4.	8000.00	1909	.....	1680	.....	190	.....	
Fuller Ditch	D 62	1894	6.5	5000.00	1904	.....	2000	.....	.....	.....	
Oliver Bros.	A 1285	1913	†	.....	1914	.....	215	.....	215	.....	
Wise Ditch	D 42	1895	1.2	340.00	1898	.....	80	.....	.....	.....	
Wm. Hagerman	A 935	1896	1.	250.00	f	.....	80	.....	.....	.....	
Follett & Krotter	A 705	1903	4.	8000.00	1914	4.	1100	1000	1028	.....	Private
Follett & Krotter	A 720	d-A705	.....	.....	.....	.....	.....	.....	.....	.....	
Follett & Krotter	A 975	d-A705	.....	.....	.....	.....	.....	.....	.....	.....	
Krotter P. P. No. 2	A 1046	†	.....	.....	.....	.....	.....	.....	.....	.....	
Krotter P. P. No. 3	A 1047	†	.....	.....	.....	.....	.....	.....	.....	.....	

STATUS OF CANALS ALONG FRENCHMAN RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Culbertson Irrigation and Water Power Co. Canal	D 24	1890-4	33.	146881.00	1914	33.	9678	8250	9418	3.50	Now Irrigation District
	D 25	d-D24	.....	.....							
	D 29	d-D24	.....	.....							
	D 30	d-D24	.....	.....							
Frenchman Valley Irr. Canal	A 1364*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Frenchman Valley	D 38	1894-5	2.5	.....	1895	.....	600	.....	.....	.....	
Goker Extension	A 714	o	.....	.....	.....	.....	.....	.....	.....	.....	
Riverside Canal	D 18	1894-7	7.5	5000.00	1914	7.5	1200	780	694	.40	Agreement
Farmers Canal	D 10	1894	5.	4000.00	1914	5.	709	700	709	.42	Stock Company
	Totals	.....	97.4	$ 203321.00	.....	79.0	23796	12596	18108	.....	

* Water right pending.
d- An additional water right for ditch (number).
o No construction work done.
f Construction never completed.
✦ Maintenance and operation.
† No further information available.

STATUS OF CANALS ALONG THE STINKING WATER CREEK
(A tributary of Frenchman River)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Chase County L. & L. S. Co. 1	A 57	1895	.7	.....	1903	.....	50	.....	.....	.....	
Chase County L. & L. S. Co....	D 57	1895	1.5	$ 525.00	1903	.....	200	.....	.....	.....	
Chase County L. & L. S. Co. 4	A 56	1895	.7	.....	1903	.....	60	.....	.....	.....	
Chase County L. & L. S. Co. 3	D 78	1895	1.	330.00	1903	.....	120	.....	.....	.....	
Chase County L. & L. S. Co. 5	D 77	1895	1.1	220.00	.....	.....	100	.....	.....	.....	
Chase County L. & L. S. Co. 6	D 76	1895	1.5	700.00	.....	.....	140	.....	.....	.....	
McLain Ditch.....	D 65	1894	1.7	350.00	1911	.....	200	.....	230	.....	
Chase County L. & L. S. Co. 7	D 72	1895	2.4	1000.00	1911	.....	320	.....	.....	.....	
Chase County L. & L. S. Co.....	D 175	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D72
F. C. Krotter No. 2.....	A 1046	.....	.....	.....	.....	.....	.....	.....	210	.....	
	Totals	.....	10.6	$ 3125.00	.....	.....	1190	.....	240	.....	

✦ Maintenance and operation.

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE REPUBLICAN RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
ROCK CREEK											
Rock Creek Ditch Co.	A 526	1900	2.		1902		60				
Owens Ditch	A 265		2.	$ 500.00	z		20				
Phelen Ditch	D 138	1882	1.7	2000.00	1911		308		308		
	Total		5.7	$ 2500.00		0.0	388		308		
HORSE CREEK											
Pringle Ditch	A 364	1896	2.	$ 1000.00	1910		160				
Pringle Ditch	A 824										d- A364
Horse Creek Ditch	D 159	1885	1.	280.00	1914	1.	200	160			Private
Horse Creek Ditch	D 173										d- D159
	Total		3.	$ 1280.00		1.	360	160			
SPRING CREEK											
*Benkelman Ditch	A 373										
SO. FK. OF REPUBLICAN R.											
McDonald Ditch	A 644	1901	1.	$ 1000.00	1914	1.	300	55	185	$ 1.00	Private
Riverside Ditch	D 156	1894	3.5	4000.00	1914	2.5	2000	20	35		Partnership
Karr's Ditch	D 155	1894	2.	1000.00	1897		140				
	Total		6.5	$ 6000.00		3.5	2440	75	220		

* Ditch obliterated if ever built.

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE REPUBLICAN RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
INDIAN CREEK											
Stoneburg Ditch	A 1070	1911	1.1	$ 1000.00	1914	1.1	70	50	20	.....	Private
Thompson & Van Sickle	A 237	1895	.7	240.00	1902	.....	65	.....	.....	.....	
Kimsey Ditch	A 261	1895	2.	325.00	1899	.....	20	.....	.....	.....	
Stoneburg Ditch No. 2	A 1299	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Chamberlain Ditch	A 240	1895	.8	75.00	1902	.....	5	.....	.....	.....	
Wilson Ditch	A 268	1894	2.2	350.00	1911	.....	100	.....	.....	.....	
	Total	.....	6.8	$ 1990.00	.....	1.1	260	50	20	.....	
RED WILLOW LAKE											
James Cooper	D 647	1894	1.5	$ 575.00	†	.....	100	.....	.....	.....	
DRIFTWOOD CREEK											
Hesterwood Irrigation Works	A 1382	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Schmitz Irrigation Works	A 1287	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Sylvan Dell	A 1340*	1913	.....	$ 4000.00	1914	.....	.....	.....	.....	.....	Private
W. S. Fitch	A 1372*	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	
BRUSH CREEK											
Brush Creek Res	A 1201	.....	.....	.....	.....	.....	.....	.....	.....	.....	
RED WILLOW CREEK											
Red Willow Valley M	A 781	1906	.4	.....	1911	.....	2000	.....	.....	.....	
Master's Ditch	A 1212	†	.....	.....	1914	.....	.....	.....	80	.....	
Helm Ditch	A 1042	†	.....	.....	.....	.....	.....	.....	440	.....	
L. J. Holland Ditch	D 95	.....	5.	$ 5000.00	1909	.....	2000	.....	.....	.....	
John F. Helm	D 111	.....	3.5	5000.00	1914	3.5	1526	320	1526	.....	Private
	Total	.....	8.9	$ 10000.00	.....	3.5	5526	320	2046	.....	

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE REPUBLICAN RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
MEDICINE CREEK											
Saunders Irrigation Plant	D 83	1894	.5	$ 490.00	1897	.....	50	.....	.....	.....	Right cancelled.
ELK CREEK											
Murray Irrigation Works	A 1315	†	.....	.....	.....	.....	.....	.....	.....	.....	
COOK CREEK											
Sharpnac Ditch	A 251	.....	1.	$ 200.00	1907	.....	100	.....	.....	.....	Abandoned.
BIG COTTONWOOD CREEK											
Bloomington Ditch	D 185	1881	1.5	.....	z	.....	190	.....	.....	.....	
Bloomington Mill	A 483	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	1.5	.....	.....	.....	190	.....	.....	.....	
CENTER CREEK											
Rose Ditch	A 648	1895	.3	$ 200.00	1899	.....	12	.....	.....	.....	Abandoned
Gregory Ditch	D 182	1894	.5	700.00	1900	.....	90	.....	.....	.....	Abandoned
	Total	.....	.8	$ 900.00	.....	.....	.....	.....	.....	.....	
COATES CREEK											
R. D. Burton	A 501	1895	.1	$ 200.00	1907	.....	25	.....	.....	.....	Abandoned

* Water right pending.
† No further information available
z Ditch now used for power purposes.
d- An additional water for ditch (number).

BUILDING AND CONSTRUCTING MATT FOR PROTECTION WORK ON FILL TO FREMONT STATE AID BRIDGE

STATUS OF CANALS ALONG OTHER TRIBUTARIES OF THE REPUBLICAN RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
CHIEF CREEK											
Sand Point Ditch	D 115	1890	1.5	$ 270.00	1893	.....	450	.....	.....	.....	
BUFFALO CREEK											
Porter & Sons Ditch	D 171	1890	3.	1500.00	1914	3.	200	200	.....	.....	Private
J. R. Porter	A 1298	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Allen & Larned Ditch	D 117	1891	4.	1500.00	1914	4.	420	320	400	$ .25	Partnership
Jenkins L. & L. S. Co. 1	A 924	1909	2.	2000.00	1911	.....	300	.....	.....	.....	
	Total	.....	9.	$ 5000.00	.....	7.	920	520	400	.....	

SUMMARY OF CANALS IN THE REPUBLICAN RIVER DRAINAGE BASIN

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
Republican River	40	164.1	41,640	$ 175,998	9	62.0	23,140	8,625	4,988
Frenchman River	17	97.4	23,796	203,321	14	79.0	19,056	12,596	18,108
Stinking Water Creek	8	10.6	1,190	3,125	.....	.....	.....	.....	.....
Total—Frenchman River Valley	25	108.0	24,986	206,446	14	79.0	19,056	12,596	18,318
Chief Creek	1	1.5	450	270	.....	.....	.....	.....	.....
Buffalo Creek	3	9.0	920	5,000	2	7.0	620	520	400
Rock Creek	3	5.7	338	2,500	.....	.....	.....	.....	.....
Horse Creek	2	3.0	360	1,280	1	1.0	200	160	.....
South Fork Republican	3	6.5	2,440	6,000	2	3.5	2,300	75	220
Indian Creek	5	6.8	.....	1,990	1	1.1	70	50	20
Red Willow Lake	1	1.5	100	575	.....	.....	.....	.....	.....
Driftwood	1	.....	.....	4,000	1	.....	.....	.....	.....
Red Willow Creek	3	8.9	5,526	10,000	1	3.5	1,526	320	1,526
Medicine Creek	1	.5	50	490	.....	.....	.....	.....	.....
Cook Creek	1	1.0	100	200	.....	.....	.....	.....	.....
Big Cottonwood Creek	1	1.5	190	.....	.....	.....	.....	.....	.....
Center Creek	2	.8	102	900	.....	.....	.....	.....	.....
Coates Creek	1	.1	25	200	.....	.....	.....	.....	.....
Total for tributaries	28	46.8	10,651	$ 33,405	8	16.1	4,716	1,1..5	2,166
Total for basin	93	318.9	77,277	415,849	31	157.1	46,912	22,346	25,472

IRRIGATION FROM THE NIOBRARA RIVER AND TRIBUTARIES

The irrigated area along the Niobrara river consists of small tracts of bottom lands scattered throughout 90 miles of the upper portion of the valley.

The first irrigation enterprise upon the river was the Lakota Ditch which was built in 1884 by B. Richards. During the succeeding years many ditches were built along the river but no new enterprise has been undertaken since 1902. In the upper portion of the valley the banks of the river are low, but the construction of a permanent dam is costly and but few permanent concrete dams have been built. Seepage from the canals is large. The normal flow of the river has been appropriated and during the hot summer months the demand for irrigation usually exceeds the flow of the river. There is some irrigation practiced from a number of the tributaries of the Niobrara river. Many of the ditches along these small tributaries, however, have been abandoned.

There are 58 existing appropriations from the river, totaling 348.30 second-feet. Seven of the appropriations either have been abandoned or have not been used for a number of years; no construction work has been done upon one; nine were merely for additional water rights or for extensions to existing ditches. No information could be obtained concerning ten appropriations. Thirty-nine ditches have been built along the river, but only 31 were in operation during 1914; thirty of those in operation are private ditches, and one a partnership ditch.

This valley is devoted chiefly to stockraising, and the water is used to irrigate wild hay and alfalfa which is grown for winter feed. A main line of the Chicago, Burlington & Quincy railroad passes through the center of the irrigated area, but portions of the irrigated area are located at such distances from the railroad that crops can not be shipped profitably.

Below is a summary of the canals from the Niobrara river and its tributaries:

SUMMARY OF CANALS FROM THE NIOBRARA RIVER AND ITS TRIBUTARIES

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
NIOBRARA RIVER	39	130.8	20,574	$ 151,798	31	81.8	13,543	6,646	7,309
Whistle Creek	2	1.7	90	400	.....	.....	.....	.....	.....
Willow Creek	1	.5	11	50	.....	.....	.....	.....	.....
Cottonwood Creek	2	1.7	100	365	1	1.2	60	.....	50
Box Butte Creek	1	.....	120	.....	1	.....	120	120	.....
Pole Creek	1	.7	40	700	.....	.....	.....	.....	.....
Boardman Creek	2	11.0	2,600	6,200	.....	.....	.....	.....	.....
Ashburn Creek	1	1.0	40	.....	.....	.....	.....	.....	.....
Spring Creek	1	.2	6	.....	.....	.....	.....	.....	.....
Newman Creek	1	.2	.....	175	.....	.....	.....	.....	.....
Horse Head Creek	1	.3	120	100	.....	.....	.....	.....	.....
Cross Creek	1	.2	.....	35	.....	.....	.....	.....	.....
Stream (no name)	1	.....	10	.....	.....	.....	.....	.....	.....
Plum Creek	2	4.3	1,800	3,000	.....	.....	.....	.....	.....
Turkey Creek	2	1.8	250	100	.....	.....	.....	.....	43
Fairfield Creek	1	.2	3	200	1	.2	3	.....	.....
Middle Creek	2	1.4	110	600	.....	.....	.....	.....	3
Rock Springs Creek	2	.8	105	527	.....	.....	.....	.....	.....
Cut Creek	2	1.0	7	160	.....	.....	.....	.....	.....
Bear Creek	2	.2	18	40	.....	.....	.....	.....	.....
Jewett Creek	1	.4	30	245	.....	.....	.....	.....	.....
Holt Creek	2	.7	20	105	.....	.....	.....	.....	.....
Huggins Creek	1	.3	40	80	.....	.....	.....	.....	.....
Rickman Creek	1	.3	80	200	1	.3	80	60	80
Beeman Creek	1	1.0	.....	385	1	.3	30	.....	30
Wooden Spring Creek	1	.2	40	100	.....	.....	.....	.....	.....
Burton Creek	2	1.5	50	165	.....	.....	.....	.....	.....
Wyman Creek	2	.5	60	115	.....	.....	.....	.....	.....
Lewis Spring	1	.3	10	75	.....	.....	.....	.....	.....

SUMMARY OF CANALS FROM THE NIOBRARA RIVER AND ITS TRIBUTARIES—(Continued)

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
Snider Creek	1	.1							
Abitz Creek	1	.7							
Rock Creek	3	6.0	400	565					
Spotted Tail Creek	1	.4		65					
Keya Paha River	1	3.5	160	900					
Eagle Creek	4	2.4	340	820					
Brush Creek	2	.7	60	225					
Bluebird Creek	1	.5	70	400					
Blackbird Creek	2	2.2	115	50					
Young Creek	1	.5	15						
Shobe Creek	1	.3	10						
Verdigris Creek	1	1.7		750					
Total for tributaries	59	51.4	6,930	17,897	5	2.0	293	180	206
Total for basin	98	182.2	27,504	$ 109,095	36	83.8	13,836	6,826	7,515

CANALS ALONG THE NIOBRARA RIVER

The ditches along the Niobrara river are practically all private enterprises, the owners using them to irrigate their own lands. The majority of the owners are extremely reticent in giving any information concerning their ditches. For this reason, not many ditches can be described.

HARRIS AND NEECE DITCH (D-517). This ditch was built during the years 1892-1896. It taps the river on the north side in Section 3, Township 28 north, Range 55 west, and about 1½ miles below the headgate branches, one branch continuing on down on the south side for a distance of 2½ miles; the other, about 4 miles long, crosses the river by a flume and covers land lying on the south side of the river. The cost of building this ditch was $3,500. Only six miles of the eight miles built were in operation during the past season. The ditch covers 1,100 acres, but only 700 acres were irrigated during 1914. The cost of operating the ditch is about $75 per year, or approximately 10 cents per acre. Alfalfa, corn, grain and wild hay are grown.

LA BELLE DITCH (D-518). This ditch was started in 1895 and completed in 1898. It diverts from the north side of the river in Section 6, Township 28 north, Range 54 west, is 4¾ miles in length, and cost $1,600. Four hundred acres lie below the ditch and this was all irrigated during the past season at a cost of $50 or about 13 cents per acre. The land is all in wild hay.

McLAUGHLIN DITCH (D-566). This ditch is 2½ miles long and was built in 1888 at a cost of about $1,800. It diverts on the north side of the river in Section 9, Township 28 north, Range 52 west, and covers about 500 acres on that side of the river. The original dam and headgates have been replaced with modern concrete structures. Two miles of the ditch were in operation during 1914, and about 400 acres, practically all in wild hay, was irrigated at an approximate cost of $1 per acre.

PIONEER DITCHES (D-442). The Pioneer ditches, one on either side of the river, were built about 1888, and divert from the same dam in Section 36, Township 29 north, Range 51 west. The north ditch, 4 7-10 miles long, was built at a cost of $964; the south side, 2 4-10 miles long, at a cost of $1,294. The original dam and headgates have been replaced by concrete structures at an additional cost of $1,000. During the season of 1914 practically all of the south ditch and 3¼ miles of the north ditch were in operation. These ditches cover 800 acres, but only 500 acres were irrigated during 1914 at a cost of about $1 per acre. This was in alfalfa and wild hay.

MIRAGE CANAL (D-474). The farmers under this project organized a company and made the only attempt that has been made on the river to construct a canal which would irrigate a large acreage. The con-

struction work was done entirely by the farmers. Seventeen miles of canal in one stretch, and four miles in another, with an unopened gap of one-half mile between, were completed during the years 1895 to 1897. The first 12 miles of the canal passes through a very rough country and none of the land under this section of the canal was irrigable. Two large flumes were built, one across Pepper creek and the other across Sand draw. The former was 1,300 feet long, 35 feet high, and contained 100,000 feet of lumber. The latter was 1,100 feet long and 45 feet high.

The canal was designed to have a grade of one foot per mile, but errors in the engineering reduced the grade to practically nothing. Five thousand acres lie below this canal, and during the six years that the company attempted to operate it, a maximum of 500 acres was irrigated.

The failure of the project can be attributed to three causes; the small water supply; poor engineering in construction, which reduced the grade so that water would hardly flow through the canal; and the sandy nature of the soil. There was practically no velocity to the flow and the water was nearly all lost through seepage into the sandy soil. Measurements taken of the discharge show that when 18 second-feet were passing through the headgates, only 4 second-feet could be delivered at the end of the 14th mile. The flume across Pepper creek collapsed in 1903, and no attempt has been made to operate the canal since that time.

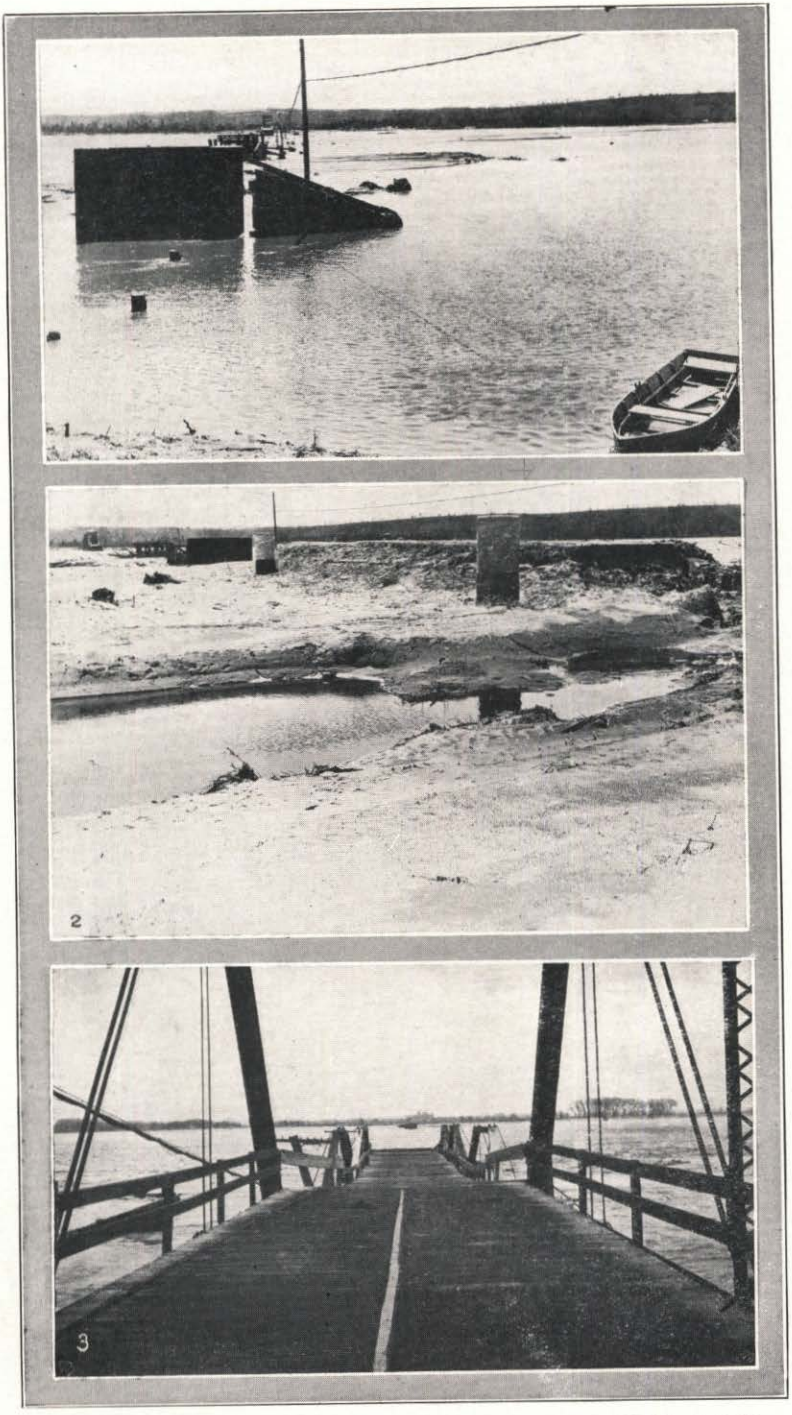
HAY SPRINGS CANAL (A-173). The Hay Springs canal taps the river on the south side in Section 29, Township 29, north, Range 47 west. Ten and one-half miles of canal were built during the years 1896-97, and about 5,000 acres could be irrigated. The river bed and banks at the point of diversion seem to be nothing but quicksand. A concrete dam was built across the river by continuing to dump concrete until there was no further settlement. At present the dam raises the water level in the river only about three feet, and the base extends about 19 feet below the bed of the river. During 1912 only 500 acres were irrigated at an approximate cost of $1 per acre.

Practically all the ditches along the tributaries of the Niobrara river are small and not many of the ditches were in operation during 1912.

The following tables show the status of the canals along the Niobrara river and its tributaries:

STATUS OF THE CANALS ALONG THE NIOBRARA RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Biglow & Seymour	D 510	1891	3.	$ 850.00	1914	3.	170	150	170	$ .65	Private
Warneke's Ditch	D 505	1895–7	2.5	1000.00	1914	2.5	150	110	115	.45	Private
Johnson Ditch	D 511	1895–6	2.	1500.00	1914	2.	200	100	.....	.75	Private
Lakota Ditch	D 554	1884	4.5	4440.00	1914	3.5	600	500	.....	.40	Private
J. S. Bourrett Ditch	A 546	1900	1.7	400.00	1914	1.7	150	60	142	.....	Private
Bourrett's Ditch	A 542	†	.....	.....	.....	.....	.....	.....	.....	.....	
J. Bourrett Ex. No. 1	A 1188	†	.5	.....	.....	.....	.....	.....	.....	.....	
J. Bourrett Ex. No. 2	A 1209	†	.5	.....	.....	.....	.....	.....	.....	.....	
Bourrett Ditch Sr	A 5	1895	1.3	300.00	1914	1.3	110	81	81	.....	Private
Bourrett Ditch	A 4	1897	1.5	600.00	1914	1.5	245	140	245	.....	Private
Bourrett Ditch	A 1057	.....	.....	.....	.....	.....	.....	.....	.....	.....	d-A4
Bieser Ditch	A 1056	†	.....	.....	1913	.....	.....	.....	55	.....	
Earnest Ditch No. 1	D 514a	1885	3.2	1300.00	1914	3.2	300	300	300	.....	Private
Earnest Ditch No. 1	D 514b	1891	3.	1625.00	c	.....	190	.....	.....	.....	
Coffee Ditch No. 3	A 1362*	.....	.....	.....	.....	.....	.....	.....	.....	.....	(1)
McGinley & S, upper	D 521	1895	1.7	225.00	1914	1.7	200	.....	200	.....	
McGinley & S, lower	D 513a	1890	4.	1675.00	1914	4.0	575	.....	575	.....	
McGinley & S, lower	D 513b	.....	2.	575.00	1914	2.0	200	.....	120	.....	
Cook Ds. No. 1 and 2	D 980	†	.....	.....	1914	.....	248	.....	248	.....	
Harris & Neece D	D 517	1892–6	8.	3500.00	1914	6.	1100	700	720	.10	Private
La Belle Ditch	D 518	1895–8	4.7	1600.00	1914	4.7	600	400	385	.13	Private
La Belle Ditch	A 60	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D518
Mettlen Ditch	A 292	1895–6	3.	800.00	1914	3	700	470	410	.....	Partnership
Mettlen Ditch	A 1248	†	.....	.....	.....	.....	.....	.....	.....	.....	
Bennett Ditch	A 1249	†	.....	.....	191x	.....	.....	.....	281	.....	
Kay Ditch	A 791	o	.....	50.00	.....	.....	.....	.....	.....	.....	Surveyed
Moore Ditch	A 88	1895	3.5	1000.00	1914	3.5	675	600	500	.....	Private
Niobrara Ditch (2)	A 1036	o	.....	1200.00	.....	.....	.....	.....	.....	.....	Cancelled



VIEWS SHOWING REMAINS OF OLD FREMONT BRIDGE AFTER FLOOD OF 1912

STATUS OF THE CANALS ALONG THE NIOBRARA RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Geo. Hitshew Ditch	A 1260*	1913 †	.....	.....	1914	.....	225	.....	225	.....	
McLaughlin Ditch	D 566	1888	2.5	1800.00	1914	2.	600	400	480	1.00	Private
Excelsior Ditch	D 568	1895	1.5	700.00	1914	1.5	200	160	100	.....	Private
Hughes Ditch	D 987*	1895	.7	600.00	1914	.7	280	80	280	.....	Private
Hughes Ditch	A 53	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D987
Snow Ditch	D 485	1895	1.	800.00	1914	1.	225	160	.....	.....	Private
Pioneer Ditches	D 442	1888	7.1	3258.00	1914	6.5	800	500	500	1.00	Private
Furman Ditch	D 462	1895	2.5	1000.00	1914	2.5	300	255	255	.40	Private
Enterprise Ditch	D 461	1894	3.	1000.00	1911	.....	400	.....	.....	.....	
Meridian Ditch	D 459	1896	3.	2000.00	1914	3.	400	400	.....	.....	Private
Meridian Ditch	A 469	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D459
McMannis & Neeland	D 463	1896	1.5	500.00	1914	1.5	120	120	100	.80	Private
McMannis & Neeland	A 448	.....	.....	.....	.....	.....	.....	.....	.....	.....	Included under D463
Fendrick Ditch	A 616	1902	.5	500.00	1914	.5	80	20	47	.....	Private
Fendrick Ditch	A 617	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A616
Lichte Ditch	D 479	1895	1.	400.00	1914	1.	310	100	210	1.00	Private
Lichte Ditch	A 1088	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D479
Lichte Ditch	A 1086	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D479
Montague Canal	A 575	.....	1.	100.00	1914	1.	60	.....	.....	.....	
Dunlap Ditch	A 900	1903	.5	200.00	1905	.....	60	.....	.....	.....	Cancelled
Chladek Ditch†	A 607	1901	.7	.....	.....	.....	21	.....	.....	.....	
Mirage Canal	D 474	1895–7	21.	$ 100000.00	1903	.....	5000	.....	.....	.....	Abandoned
Potmesil Ditch	A 757	1905	3.5	2500.00	1914	3.5	350	300	80	$ .50	Private
Potmesil Bros.	A 1152	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A757
Hay Springs Canal	A 173	1896–7	10.5	7500.00	1914	10.5	3000	500	.....	1.00	Private
Taylor's Ditch	A 766	1904	3.	1000.00	1914	3.	320	40	370	.....	Private
Ussher Ditch	A 82	.....	3.5	500.00	1898	.....	175	.....	.....	.....	
Camille Ditch	A 1087	†	.....	.....	.....	.....	.....	.....	.....	.....	
Wells Pumping Pt	A 1193	†	.....	.....	.....	.....	.....	.....	115	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF NIOBRARA RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Wilson Ditch	D 591	1895	4.	1500.00	1895	.....	400	.....	.....	.....	(3)
McCully Ditch	D 583	1895	6.2	2500.00	1902	.....	600	.....	.....	.....	
Chas. Tienken	D 575	1894	2.	800.00	e	.....	70	.....	.....	.....	
	Total	.....	130.8	$ 151798.00	.....	81.8	20574	6646	7309		

* Water right pending
† No further information available.
c Ditch not used for years.
d An additional water right for ditch (number).
o No construction work done.
(3) Ditch washed out the first time that water was run in the ditch.
(1) Covers same lands as formerly covered by Earnest Ditch No. 2.
(2) Money was expended in making surveys.
e An extension to ditch (number).

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF NIOBRARA RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
WHISTLE CREEK											
Home Ditch	A 65	1898	.5	$ 200.00	1912	.5	40	30	.....	$ 1.00	Private
Whistle Creek Ditch	A 58	1896	1.2	200.00	1897	m	50	.....	.....	.....	
	Total	.....	1.7	$ 400.00		.5	90	30	.....	.....	
DRY CANYON											
Gilmore Ditch	A 863	o	.....	.....	.....	.....	.....	.....	.....	.....	
WILLOW CREEK											
Hollibough Ditch	A 898	1908	.5	$ 50.00	1911	.....	11	.....	.....	.....	
COTTONWOOD CREEK											
Morrisey's Ditch	D 481	1896	.5	$ 65.00	c	.....	40	.....	.....	.....	
Fendrick & Lichte	A 336	1895	1.2	300.00	1914	1.2	60	.....	50	.....	
Dunlap	A 1113	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	1.7	$ 365.00	.....	1.2	100	.....	50	.....	
BOX BUTTE CREEK											
Billy's Ditch	A 533	(1)	.....	.....	1912	.....	120	120	.....	.....	Private
POLE CREEK											
Pole Creek Ditch	A 799	1898	.7	$ 700.00	1899	.....	40	.....	.....	.....	
ANTELOPE CREEK											
Antelope Ditch	A 798	o	.....	.....	.....	.....	.....	.....	.....	.....	
BOARDMAN CREEK											
Lee Ditch	D 973	1895	4.	1200.00	1912	4.	600	300	.....	.....	Partnership
J. H. Bachelor	A 1155	1912	7.	5000.00	1912	u	2000	.....	.....	.....	Private
	Total	.....	11.	$ 6200.00	.....	4.	2600	300	.....	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF NIOBRARA RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
ASHBURN CREEK											
Ashburn Canal	A 676	1887	1.		1912	1.	40	40			Private
SWEENEY CANYON											
Canyon Canal†	D 414										
SPRING CREEK											
Garden Ditch	A 555		.2		1912	.2	6	1			Private
STREAM—NO NAME											
Grant Ditch†	D 400										
CEDAR LAKE											
Cedar Lake Ditch†	A 1027										
NEWMAN CREEK											
Newman Ditch†	D 617		.2	175.00							
HORSE HEAD CREEK											
Bruce Ditch	A 149		.3	100.00	1900		126				
CROSS CREEK											
Hutchinson†	D 615		.2	35.00							
STREAM—NO NAME											
Conger Ditch	A 158	1895	dam		1900	m	10				
SPRINGS											
Glen Cove Ditch	A 1067										

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF NIOBRARA RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
PLUM CREEK											
Johnstown Ditch	D 405	1896	4.	$ 3000.00	1897	.....	1800	.....	.....	.....	
Wilbert Ditch	A 329	†	.3	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	4.3	$ 3000.00	.....	.....	1800	.....	.....	.....	
TURKEY CREEK											
Turkey Creek Ditch	A 539	1898	.3	$ 100.00	1911	.....	100	.....	20	.....	
Turkey Creek Ditch No. 2	A 754	.....	1.5	.....	c	.....	150	.....	23	.....	
	Total	.....	1.8	$ 100.00	.....	.....	250	.....	43	.....	
FAIRFIELD CREEK											
Wm. H. Kuhre	D 612b	†	.2	$ 200.00	1914	.2	3	.....	3	.....	Private
MIDDLE CREEK											
McGuire Ditch	D 606	1894	.4	$ 100.00	1912	.2	50	10	.....	$ 1.00	Private
Allen Ditch	D 616	1891	1.	500.00	1909	m	60	.....	.....	.....	
Continence Ditch	A 753	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D616
	Total	.....	1.4	$ 600.00	.....	.2	110	10	.....	.....	
ROCK SPRINGS CREEK											
Van Koten Ditch	D 619	1895	.3	$ 50.00	1897	.....	5	.....	.....	.....	
Moore's Ditch	D 593	.....	.5	477.00	1911	n	100	.....	.....	.....	
	Total	.....	.8	$ 527.00	.....	.....	105	.....	.....	.....	
CUB CREEK											
Tissue & Patterson	D 618	.....	.5	$ 60.00	1896	.....	2	.....	.....	.....	
McCumber Ditch	D 589	.....	.5	100.00	1896	.....	5	.....	.....	.....	
	Total	.....	1.0	$ 160.00	.....	.....	7	.....	.....	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF NIOBRARA RIVER—(Continued)

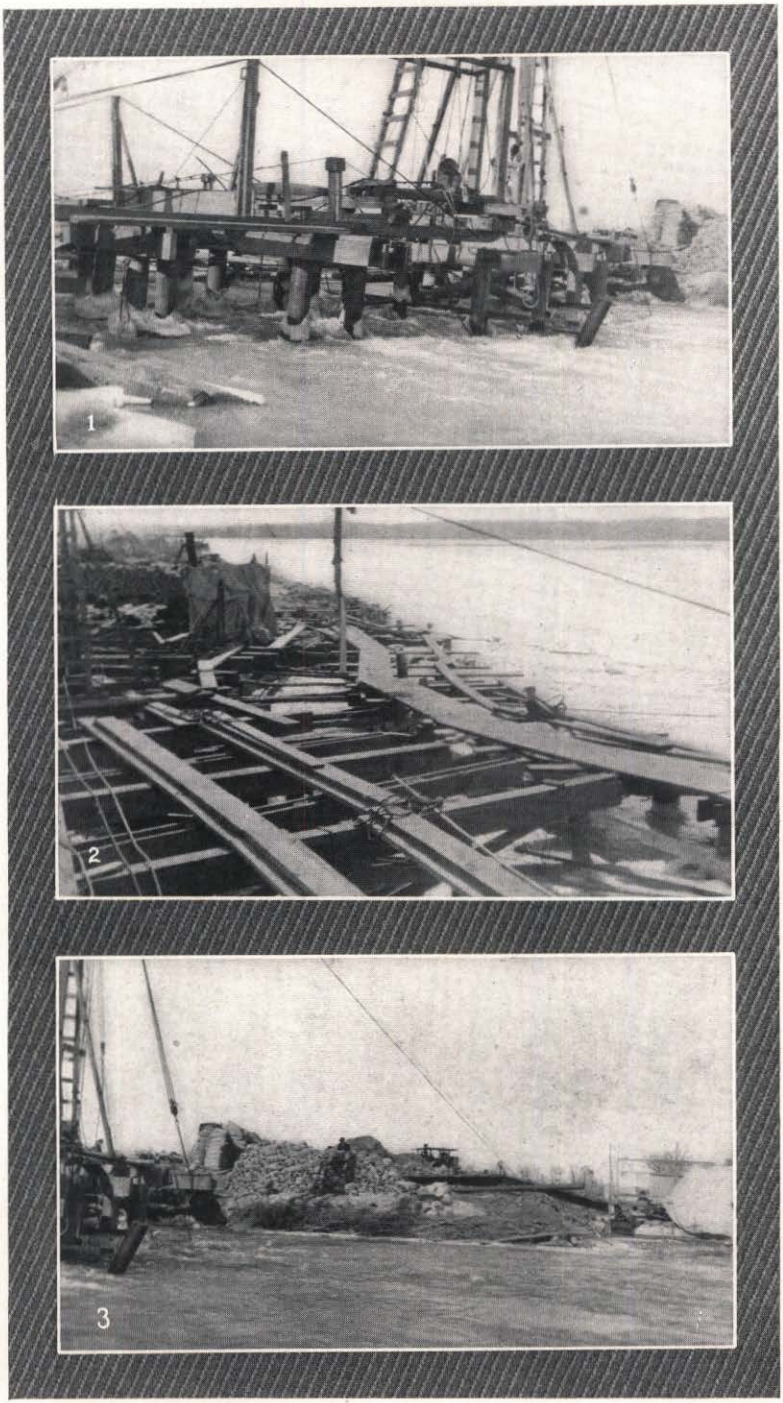
	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
BEAR CREEK											
Cedarburg No. 1 and 2	A 479	1898	.1	$ 15.00	1900	.....	3	.....	.....	.....	
Skinner Ditch	D 609	1888	.1	25.00	1896	.....	15	.....	.....	.....	
	Total	.....	.2	$ 40.00	.....	.....	18	.....	.....	.....	
JEWETT CREEK											
Big Little Ditch	D 590	1895	.4	$ 245.00	1911	.....	30	.....	.....	.....	
HOLT CREEK											
Akers Ditch	D 611	1895	.5	$ 65.00	1901	.....	10	.....	.....	.....	
Schoetger Ditch	D 595	1895	.2	40.00	1899	.....	10	.....	.....	.....	
	Total	.....	.7	$ 105.00	.....	.....	20	.....	.....	.....	
HUGGINS CREEK											
Soper Ditch	D 592	1895	.3	$ 80.00	1896	.....	40	.....	.....	.....	
RICKMAN CREEK											
Byington Ditch	D 582	1890	.3	$ 200.00	1914	.2	80	60	80	$ 1.00	Private
BEEMAN CREEK											
Barnard Ditch†	D 603	1890	.5	$ 110.00	.....	.....	40	.....	.....	.....	
Beeman Ditch†	D 620	189.	.2	200.00	c	.....	70	.....	70	.....	e- D603
Beeman & Rickman	D 613	1895	.3	75.00	1914	.....	30	.....	30	.....	e-D620
	Total	.....	1.0	$ 385.00	.....	.....	140	.....	100	.....	
WOODEN SPRING CREEK											
Rhodes Ditch	A 512	1899	.1	$ 75.00	1900	.....	15	.....	.....	.....	
Rhodes Ditch	A 544	1900	.1	25.00	1900	.....	25	.....	.....	.....	e- A512
	Total	.....	0.2	$ 100.00	.....	.....	40	.....	.....	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF NIOBRARA RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
BURTON CREEK											
One Trip Ditch	A 142	.....	.5	$ 15.00	1900	.....	20	.....	.....	.....	
Burton Creek Ditch	D 608b	1895	1.	150.00	1900	.....	30	.....	.....	.....	
	Total	.....	1.5	$ 165.00	.....	.....	50	.....	.....	.....	
WYMAN CREEK											
Horton Ditch	D 587	.....	.2	$ 75.00	1902	.....	10	.....	.....	.....	
McCully Ditch	D 604	1891	.3	40.00	1910	.....	50	.....	.....	.....	
	Total	.....	.5	$ 115.00	.....	.....	60	.....	.....	.....	
LEWIS SPRING											
Lewis Ditch	A 139	1896	.3	$ 75.00	1896	a	10	.....	.....	.....	
SNIDER CREEK											
Olds Ditch†	D 607	.....	.1	.....	.....	.....	.....	.....	.....	.....	
CROOKED CREEK											
Crooked Creek Ditch	D 608a	(2)	.....	.....	.....	.....	.....	.....	.....	.....	
ABITZ CREEK											
Fullerton Ditch No. 2†	A 278	1897	.7	.....	.....	.....	.....	.....	.....	.....	
ROCK CREEK											
Copeland Ditch	D 394	1893	5.	$ 500.00	1897	.....	400	.....	.....	.....	Right cancelled
Necessity Ditch	D 395	1895	.5	65.00	f	.....	.....	.....	.....	.....	
Wile's Ditch	D 397	1895	.5	.....	f	.....	.....	.....	.....	.....	
	Total	.....	6.0	$ 565.00	.....	.....	400	.....	.....	.....	
SPOTTED TAIL CREEK											
Spotted Tail Creek Ditch	D 601	1895	.4	$ 65.00	†	.....	.....	.....	.....	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF NIOBRARA RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
KIBBEY CREEK											
Green Ditch†	A 747	.....	.....	.....	.....	.....	.....	.....	.....	.....	
KEYA PAHA RIVER											
Yocum's Ditch	D 573	1894	3.5	$ 900.00	1894	n	160	.....	.....	.....	
EAGLE CREEK											
Eagle Valley Ditch	D 280	1894	1.2	$ 350.00	1895	.....	160	.....	.....	.....	
100 foot ditch	D 276	1894	.02	75.00	1896	.....	20	.....	.....	.....	Right cancelled
Bokhof Ditch	D 275	1895	.7	200.00	1899	.....	100	.....	.....	.....	
Samuel Becker Ditch	D 274	1894	.5	195.00	1900	.....	60	.....	.....	.....	
	Total	.....	2.42	$ 820.00	.....	.....	340	.....	.....	.....	
BRUSH CREEK											
McCarthy No. 1	D 264	1894	.2	$ 150.00	1895	.....	30	.....	.....	.....	
McCarthy No. 2	D 266	1894	.5	75.00	1895	.....	30	.....	.....	.....	
	Total	.....	.7	$ 225.00	.....	.....	60	.....	.....	.....	
BIG SANDY CREEK											
ΔBadger Ditch	A 567	.....	.....	.....	.....	.....	.....	.....	.....	.....	
BLUEBIRD CREEK											
Murphys Ditch	D 273	1894	.5	$ 400.00	1895	.....	70	.....	.....	.....	
BLACKBIRD CREEK											
Mullen Ditch†	D 267	.....	1.7	.....	c	.....	100	.....	.....	.....	
Robertson Ditch	D 270	.....	.5	$ 50.00	c	.....	15	.....	.....	.....	
	Total	.....	2.2	$ 50.00	.....	.....	115	.....	.....	.....	



VIEWS SHOWING WORK OF CLOSING FILL, NORTH BEND STATE AID BRIDGE

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF NIOBRARA RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
YOUNG CREEK											
Harvey & Lamb Ditch	A 311	1894	.5	†	c	.....	15	.....	.....	.....	
SHOBE CREEK											
A. J. Lamb	A 322	†	.3	.....	c	.....	10	.....	.....	.....	
VERDIGRIS CREEK											
Drayton Ditch	D 248	.....	1.7	$ 750.00	y	.....	.....	.....	.....	.....	Obliterated

Δ Ditch was never used, almost obliterated at the present time.
* Water right pending.
† No further information available.
c Ditch not used for years.
m Dam washed out that year.
d An additional water right for ditch (number).
(2) Was no doubt a second appropriation for Burton Cr. Ditch, taking water from Crooked Creek.
u Ditch still under construction.
o No construction work done.
f Construction never completed.
y Ditch was never used.
✦ Maintenance and operation.
(1) Built three dams and subirrigates without ditches.
e An extension to ditch (number).
n Dam washed out the following year.

IRRIGATION FROM WHITE RIVER AND ITS TRIBUTARIES

The area irrigated from White river lies to the north and east of the town of Crawford, while the area irrigated from the tributaries of the river consist of small scattered tracts in the bottoms along these streams. The first irrigation ditch built within the White river drainage basin was the Tucker ditch, built on Spring branch in 1883. The Jacobson ditch was built from the river itself the same year. The majority of the ditches were built during the next six years, but a few have been constructed as late as 1905 and 1906.

There are 37 existing appropriations from the river, totaling 148.27 second-feet. Of this number, 15 either have been abandoned or have not been used for a number of years, and six were merely for additional water rights or for extensions to existing ditches. One of the latter has not been used for a number of years and is included among the 15 mentioned above.

The banks of the river throughout the irrigated area are quite low and as the river is subject to spring floods dams built across the river are hard to maintain. Usually the greater portion of the cost of maintenance and operation is expended in repairing and keeping the dams in operation.

In a few instances excessive amounts of water have been used along the river and in one case the land has been almost ruined by the black alkali which has been brought to the surface.

Twenty-six ditches have been built along the river but only eleven of these were operated during 1914. Six were operated as private ditches and five as partnership ditches. The principal crops grown by irrigation are alfalfa and wild hay. Some fruit is grown under irrigation, but fruit growing never has been attempted on a commercial scale.

A main line of the Chicago, Burlington & Quincy railroad crosses the upper portion of the irrigated section at Crawford, and the Chicago Northwestern railroad traverses the valley, thus providing good railway facilities to outside markets.

Below is given a summary of the canals along White river and its tributaries:

SUMMARY OF CANALS FROM WHITE RIVER AND ITS TRIBUTARIES

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	Reported 1914
WHITE RIVER	26	62.4	10,233	$ 180,765	11	25.9	5,270	2,538	3,064
Ash Creek	1	.3	10	50					
Kyle Creek	1	1.0							
Bull Creek	1	.3	20	350					
Deep Creek	2	1.0	18	400	2	1.0	18	18	18
Charcoal Creek	1	.3	8	50					
Cedar Canyon Creek	1	.5	60	300	1	.5	60	20	
Deadman Creek	3	2.1	135	700	3	1.6	125	35	58
Soldier Creek	1	.2	10	150					
White Clay Creek	6	5.4	580	3,365	4	3.4	460	188	300
Saw Log Creek	3	.9	80	400	3	.9	80	47	
English Creek	1	.7	80	350	1	.7	80	45	15
Squaw Creek	2	2.7	210	1,400	1	1.0	160	70	285
Hooker Creek	3	1.0	300	300	3	1.0	300	115	100
Canyon to White River	1	.7			1	.7			
Sand Creek	3	2.7	80	1,550	2	1.2	80	11	
Little Cottonwood Creek	9	7.9	1,397	4,050	7	7.9	1,397	580	922
Spring Creek	6	4.7	580	2,400	3	3.5	490	390	355
Cottonwood Creek	3	10.7	200	4,450					
Ash Creek	11	12.4	1,155	4,125	10	9.9	1,155	465	670
Indian Creek	3	1.4	51	150	3	1.4	51	15	9
Trunk Butte Creek	1	.5	5	155					
Dead Horse Creek	6	2.8	130	1,580	2	1.1	105	75	80
Chadron Creek	4	3.1	129	975					
Lone Tree Creek	1	1.5	100	300					
Canyon to White River	1	.5	125	50	1	.5	125	100	

SUMMARY OF CANALS FROM WHITE RIVER AND ITS TRIBUTARIES—(Continued)

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	Reported 1914
Rush Creek	1	1.5	360	500	1	1.5	360	300	.....
Maiden Creek	2	1.0	285	2,000	1	.....	25	25	.....
Bordeaux Creek	12	5.8	610	12,125	1	.5	50	3	140
Little Bordeaux Creek	5	3.8	230	1,085	3	1.6	140	58	72
Canyon to White River	1	1.0	15	.....	.....	.....	.....	.....	20
Beaver Creek	7	5.5	460	2,850	4	4.2	390	375	222
Sheridan Creek	1	.5	.....	100	.....	.....	.....	.....	.....
White Clay Creek	1	2.6	470	4,155	1	2.6	470	.....	470
Total for Tributaries	105	87.0	7,893	$ 50,415	58	46.7	6,121	2,935	3,736
Total for Basin	131	149.4	18,126	231,180	69	72.6	11,391	5,473	6,800

CANALS ALONG THE WHITE RIVER

The majority of the ditches from White river and its tributaries are small, and no further mention, except as shown in the table below, will be made of them.

CRAWFORD CITIZENS CANAL (D-444). The Crawford Citizens Canal was by far the largest enterprise ever undertaken in the northwestern portion of this state. The Crawford Citizens Canal Company was organized and about $150,000 was raised for the purpose of building this project, which embraced the construction of a canal to tap the river in Section 23, Township 31 north, Range 53 west, cross Fort Robinson military reserve, and convey the water to about 4,000 acres surrounding the town of Crawford. The flow of the river during the summer months is not sufficient to supply a canal of such a large capacity and in order to supply water during the drier months a reservoir site about two miles southwest of the town was acquired. Twenty-five miles of the canal were built and the reservoir was almost completed during 1896.

About this time the company brought suit against some of the prior water rights along the river. The District Court of Dawes county finally granted a decree whereby the company could acquire these rights by paying the acrued damages, but the company had become insolvent before the decree was handed down. The failure of this enterprise is attributed to poor management and to the topographical features of the country. The country traversed by the canal was very rough, requiring heavy construction work, and the cost of construction must have run high. The actual cost of construction can not be ascertained, but the entire $150,000 that was raised, disappeared.

Landowners residing under the completed portion of the canal attempted for five or six years to operate the canal and about 500 acres were brought under irrigation. Finally a large washout about three-fourths of a mile below the headgate occurred and no attempt to operate has been made since. The channel of the river has changed and now follows the line of the canal to where the above mentioned washout occurred and then turns back into the old channel.

The dam to the reservoir was practically completed and a fairly large body of water could be stored. This reservoir was located upon a very much lower level than the canal and by building a new intake canal several miles long, the reservoir could be utilized for the storage of the annual spring floods of White river.

HALL'S DITCH No. 2 (D-478c). This ditch was built during the eighties to bring water to a mill. On January 10, 1895, a notice for the appropriations of water for irrigation was posted. Construction was begun on March 7, 1895, and seven miles of canal were completed by May 30, 1895, at a cost of about $4,850. Water was turned into the canal on April 10, 1895.

This canal is now owned by a partnership. About 1,800 acres lie below the canal, but only about 500 acres are irrigated each year. Formerly considerable water was rented or sold to the various landowners under the ditch. The present owners operate the ditch to supply water to their own lands and rent but very little water, the rental charge being $2.50 per acre. Alfalfa and wild hay are the principal crops grown.

WHITE RIVER IRRIGATION DITCH (D-477). A company was organized in 1894. During 1895-96, 5 3-10 miles of canal were built at a cost of $3,600. The ditch was first operated in 1898. It diverts on the south side of the river in Section 35, Township 32 north, Range 52 west, about two miles below the town of Crawford. An attempt was made to incorporate the company in 1906, but failed, and the ditch is now operated by a partnership. Each partner does his share of the maintenance work, and it is estimated that it costs about $1 per acre. Three hundred and thirty of the 900 acres below the ditch were irrigated during 1914. Alfalfa and wild hay are grown almost exclusively under this ditch.

HARRIS AND COOPER DITCH (D-464). This ditch was built by a partnership. Later two of the partners acquired control of the ditch, granting water rights to the other parties for their interests.

The ditch was built by contract for $10,000, eight miles being completed during 1894-95. The partners pro-rated the cost of operating the ditch among themselves. Water also is rented to outside parties at an annual rate of $2.50 per acre. Only 700 of the 1,400 acres lying below the ditch were irrigated during 1914. The annual cost of keeping the ditch in repair is about $300, or about 40 cents per acre. Alfalfa is the principal crop grown by irrigation.

RASHER DITCH (D-467). The present ditch consists of the original ditch and three extensions. Its length is about four miles and the total cost was about $3,500. The ditch covers 420 acres, of which 230 acres were irrigated during 1914 at a cost of approximately $1.25 per acre.

CARPENTER DITCH (D-487). A ditch two miles long was built in 1894, at a cost of $530, and water was conveyed to 200 acres. White river is subject to spring floods and in 1909 the dam at the head of this ditch was washed out. The present owner of the land under the ditch has abandoned the upper portion of the ditch and has installed a 35-horsepower engine and pump on the bank of the river. Water to irrigate 40 acres is pumped into the old ditch, and in addition, water is raised 30 feet to the table, where 160 acres are irrigated by a short ditch. The cost of the new ditch and pumping plant was approximately $2,500.

The following tables show the status of the canals along the White river and tributaries:

STATUS OF THE CANALS ALONG THE WHITE RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O.	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	
Lewis Ditch	A 340	1896	.3	.....	1912	.....	10	6	.....	.....	Private
Hughson Ditch	D 520	1895	.2	$ 60.00	1905	.....	5	.....	.....	.....	
Diedrickson Ditch	D 562	.....	.3	50.00	1906	.....	20	.....	.....	.....	
Mason Ditch	A 337	.....	.5	100.00	1905	.....	8	.....	.....	.....	
Jacobson Ditch	D 561	.....	.3	.....	1908	.....	15	.....	.....	.....	
Crawford Citizens Ditch	D 444	1896	25.	150000.00	1902	.....	4000	.....	.....	.....	Abandoned
Crawford Citizens Ditch	D 501	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D444
Roby Ditch	A 838	1906	.3	75.00	1907	m	20	.....	.....	.....	
Butterworth Ditch	D 490	.....	.4	200.00	1906	.....	5	.....	.....	.....	
Hall's Ditch No. 2	D 478c	1895	7.	4850.00	1914	6.	1800	761	912	$ 2.50	Partnership
White River Irrigation Ditch	D 477	1895-6	5.3	3600.00	1914	5.	900	600	.....	1.00	Partnership
White River Irrigation Ditch	A 936	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D477
Pinney & Denslow Reservoir	A 1122	†	.....	.....	1914	.....	.....	.....	90	.....	
Harris & Cooper Ditch	D 464	1894-5	8.	10000.00	1914	8.	1400	700	1360	2.50	Partnership
Wilkinson Ditch	A 421	.....	.8	400.00	1914	.8	50	35	.....	1.25	Private
Rasher Ditch	D 467	1894	4.	3500.00	1914	4.	420	355	392	1.25	Partnership
Rasher Ditch	A 456	.....	.....	.....	.....	.....	.....	.....	.....	.....	e- D467
Rasher Ditch	A 534	.....	.....	.....	.....	.....	.....	.....	.....	.....	e- A456
Rasher Ditch	A 740	.....	.....	.....	.....	.....	.....	.....	.....	.....	e- A534
Forbe's Extension	A 1128	.....	.....	.....	.....	.....	.....	.....	.....	.....	e- A740
Zuen & Schmelzle	A 475	1898	.5	100.00	1905	m	80	.....	.....	.....	
Welling Ditch	D 469	1893	.3	300.00	1914	.1	40	2	20	.....	Private
Mecham Ditch	A 500	1895	.7	2000.00	1907	m	200	.....	.....	.....	
Wright's Ditch	A 775	1905-6	1.	800.00	1907	.....	280	.....	.....	.....	
Simmons & H. Irri. Co.	A 730	1903	1.	100.00	1914	1.	100	100	.....	.25	Partnership
Kusel White River Ditch	A 1367*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Sandy Stewart Ditch	A 427	†	1.	.....	y	.....	60	.....	.....	.....	Washed out
Schaffer & Blust Ditch	A 525	.....	1.	2000.00	1907	m	100	.....	.....	.....	
Carpenter Ditch	D 487	1894	.2	530.00	1914	.....	200	40	200	.....	Private (1)
Carlson Ditch	A 588	.....	1.	1000.00	1908	m	110	.....	.....	.....	
Hebbert Irrigation Ditch	A 707	1903	.5	1000.00	1914	.....	210	75	50	.....	Private (1)

STATUS OF THE CANALS ALONG THE WHITE RIVER—(Continued)

	No.	Built Year	Built Mile	Cost	Operated Yr.	Operated Mile	Acreage Under Ditch	Acreage Irrig. 1912	Acreage Repts 1914	✦M. & O. 1912	
Hebbert Irrigation Ditch	A 1360	†	.....	.....	.....	.....	.....	.....	.....	.....	
Jensen's Irrigation Plant	A 1110	†	.....	.....	1914	.....	.....	.....	40	.....	
Schwabe Ditch	A 758	1905	.7	100.00	1914	.7	60	55	.....	.55	Private
Schwabe Ditch	A 815	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A758
Schwabe Ditch	A 394	1897	.3	.....	1914	.3	90	70	.....	1.00	Private
E. Jones Ditch	A 391	1900	.7	.....	1902	.....	50	.....	.....	.....	
	Total	.....	62.4	$ 180765.00	.....	25.9	10233	2538	3064	.....	

* Water right pending.
† No further information available.
✦ Maintenance and operation.
m Dam washed out that year.
d An additional water right for ditch (number).
e An extension to ditch (number).
y Ditch was never used.
(1) Ditch shortened and pumping plant installed pumping into shortened ditch.

OLD BAYARD BRIDGE

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
SPRING BRANCH											
Tucker Ditch	D 557	1883	.2	$ 50.00	1906	.....	10	.....	.....	.....	
KYLE CREEK											
Kyle Cr. Ditch	D 522	.....	1.	.....	c	.....	.....	.....	.....	.....	
BULL CREEK											
Johnson Ditch No. 1	D 519	1895	.3	350.00	1907	.....	20	.....	.....	.....	
DEEP CREEK											
Green Ditch	A 203	1900	.8	300.00	1914	.8	14	14	14	.....	Private
Deep Creek Ditch	D 525	1896	.2	100.00	1914	.2	4	4	4	.....	Private
	Total	.....	1.0	$ 400.00	.....	1.0	18	18	18	.....	
CHARCOAL CREEK											
Klein Ditch	D 982	1882	.3	$ 50.00	1906	.....	8	.....	.....	.....	
CEDAR CANYON CREEK											
Cedar Canyon Ditch	A 380	1897	.5	300.00	1914	.5	60	20	.....	.....	Private
DEADMAN CREEK											
Stewart Ditch	A 334	1896	.3	200.00	1914	.3	15	.....	13	.....	
Phillips Ditch	A 547	1900	.3	100.00	1914	.3	10	.....	10	.....	
Linderman Ditch	A 564	1900	.5	200.00	1906	.....	10	.....	.....	.....	e- A547
Porter & Rasmussen	A 562	1902	1.	200.00	1914	1.	100	35	35	$ .60	Private
	Total	.....	2.1	$ 700.00	.....	1.6	135	35	58	.....	
SOLDIER CREEK											
Rodgers Ditch	D 546	1883	.2	$ 100.00	1902	.....	10	.....	.....	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Swanson Ditch	A 786	o	.....	50.00	.....	.....	.....	.....	.....	.....	Merely surveyed
	Total	.....	.2	$ 150.00	.....	.....	10	.....	.....	.....	
WHITE CLAY CREEK											
Little Saw Log Ditch	A 849	.....	.7	$ 800.00	(1)	.....	40	.....	.....	.....	
Brockway Ditch	A 256	1896	.8	400.00	1896	m	40	.....	.....	.....	
Hazelton Ditch	D 475	1894	.8	400.00	1914	.8	60	0	.....	.....	Private
Hutzell Ditch	A 704	1903	.5	.....	1908	.....	40	.....	.....	.....	e- D475
Rincker Ditch	A 618	1900	1.	900.00	1914	1.	40	33	40	2.00	Private
Cooper Ditch	A 42	1895	1.	600.00	1914	1.	260	60	260	2.00	Private
White River Irrigation Ditch	A 655	.....	.....	.....	.....	.....	.....	.....	.....	.....	d-D477 White River
McFarland Ditch	D 960	1894	.6	265.00	1914	.6	100	95	.....	.30	Private
	Total	.....	5.4	$ 3365.00	.....	3.4	580	188	300	.....	
SAW LOG CREEK											
Little Saw Log Ditch	A 849	.....	.3	$ 100.00	1914	.3	10	10	.....	.....	Private
Baker Ditches	A 884	1903	.1	100.00	1914	.1	10	2	.....	.....	Private
Van Treeck Canal	A 1098	u	.....	.....	.....	.....	.....	.....	.....	.....	
Stephenson Ditch	A 852	1908	.5	200.00	1914	.5	60	35	.....	.50	Private
	Total	.....	.9	$ 400.00	.....	.8	80	47	.....	.....	
ENGLISH CREEK											
McDowell's S. Reservoir	A 772	1914	.7	$ 350.00	1914	.7	80	45	15	1.00	Private
SQUAW CREEK											
Daniels & Stetson	A 27	1895	1.7	$ 700.00	1907	.....	50	.....	.....	.....	Ditch filled in
White River Irrigation Ditch	A 655	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D477
Squaw Creek	A 1132	†	.....	.....	1914	.....	.....	.....	125	.....	
Cooper Ditch	A 333	1894	1.0	700.00	1914	1.	160	70	160	1.00	Private
	Total	.....	2.7	$ 1400.00	.....	1.0	210	70	285	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
HOOKER CREEK											
McMannis Ditch	D 492	1889	.6	$ 300.00	1914	.6	60	30	.....	.....	Private
Alcorn Ditch	A 803	1906	.3	.....	1914	.3	140	80	.....	.25	Private
Souther Lake	A 915	1907	.1	.....	1914	.1	100	5	100	2.00	Private
	Total	.....	1.0	$ 300.00	.....	1.0	300	115	100	.....	
CANYON TO WHITE RIVER											
Jones Ditch	A 860	1913	.7	.....	1914	.7	.....	.....	.....	.....	Private.
SAND CREEK											
Jordan Ditch	A 551	1902	.7	$ 300.00	1914	.7	50	1	.....	.....	Private
Benedix Ditch	A 189	.....	.5	250.00	1914	.5	30	10	.....	.....	Private
Arner Ditch	A 779	s	.....	.....	.....	.....	.....	.....	.....	.....	
Sand Creek Ditch	A 767	s	1.5	1000.00	(2)	.....	.....	.....	.....	.....	
K. Rasmussen Ditch	A 811	o	.....	.....	†	.....	.....	.....	.....	.....	
Syndicate Ditch	A 1190	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	2.7	$ 1550.00	.....	1.2	80	11	.....	.....	
LITTLE COTTONWOOD CREEK											
Dodd & McDowell	A 1276	†	.....	.....	.....	.....	.....	.....	.....	.....	
Dodd & McDowell Ditch	A 995	1910	.7	$ 500.00	1914	.7	200	10	.....	.....	Partnership
Stuart Bros. Ditch	A 8	1895	1.	800.00	1914	1.	260	150	200	$ .35	Partnership
Thos. Stuart Ditch	D 425	1891	.3	300.00	1914	.3	70	25	25	1.00	Private
Dunn's Ditch	A 649	1902	1.2	450.00	1914	1.2	150	80	150	.75	Private
Stewart & Maple Ditch	A 656	1902	.7	600.00	1914	.7	67	15	67	2.00	Partnership
Kusel Ditch No. 2	A 560	1900	.5	150.00	1914	.5	150	30	30	.....	Private
Kusel & Spearman	A 677	1901	1.5	300.00	1914	1.5	300	70	60	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Simmons Ditch	A 521	1899	.5	450.00	1914	.5	80	80	40	.65	Private
Broadhurst Ditch	A 1264	†							230		
Kusel Ditch	A 183	1896	1.5	500.00	1914	1.5	120	120	120		Private
	Total		7.9	$ 4050.00		7.9	1397	580	922		
SPRING CREEK—A tributary of Little Cottonwood Creek											
Forbes' Ditch	A 663	1902	.5	$ 100.00	1914	.5	30	30	35		Private
Wolff Ditch	A 739	1904	.7	100.00	1905		90				
Moszeter Ditch	D1014*		.5		†				125		
Swinbank Reservoir	A 1358	†									
Spring Creek Ditch	D 466	1894	.8	700.00	1914	.8	60	60	55	1.00	Private
Spring Creek Ditch No. 1	D 473	1895		600.00	(3)						
Spring Creek Ditch No. 1	A 788	1905	2.2	900.00	1914	2.2	400	300	140	1.00	Partnership
	Total		4.7	$ 2400.00		3.5	580	390	355		
COTTONWOOD CREEK											
Rasmussen Ditch	A 444	1898	8.	$ 2800.00	(2)						s
N. Rasmussen	A 528				(2)						s
Carlson Ditch	A 409	1902	2.	1500.00	1905	m	200				
Pilster Ditch	A 776		.7	150.00							Cancelled
	Total		10.7	$ 4450.00		0.0	200				
FLOOD WATERS											
Lenehan Reservoir	A 1278	†									

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
ASH CREEK											
Mace Ditch	D 428	1885	1.	$ 400.00	1914	1.	80	00	40	.....	Private
Broadhurst Reservoir	A 1333	†	.....	.....	.....	.....	.....	.....	.....	.....	
W. Ash Creek Irri. Co	D 452	1893	3.	500.00	1914	2.	320	150	320	$ .25	Mutual Stock Co.
Woodard Ditch	D 434	1898	.3	250.00	1914	.3	75	40	10	2.00	Private
Todd Ditch	A 520	1899	.8	500.00	1914	.8	30	20	26	.75	Private
Barron Ditch	D 438	1888	.3	75.00	1914	.3	60	20	.....	.....	Private
Ox Yoke Ditch	D 447	1880	1.5	200.00	1914	.1	200	40	.....	1.00	Private
Stumph Ditch	D1023½	* †	.....	.....	.....	.....	.....	.....	.....	.....	
Shelton Ditch	A 493	1899	.5	100.00	1914	.5	150	70	124	.20	Private
Cripps Ditch No. 2	A 735	1903	2.5	1200.00	1914	2.5	120	65	70	.....	Private
Cripps Ditch No. 2	A 835	1900	.....	.....	.....	.....	.....	.....	.....	.....	e- A735
Cripps Ditch	A 491	1902	1.	500.00	1914	1.	80	30	80	1.00	Private
W. L. Compton	D 455	.....	1.	.....	c	.....	.....	.....	.....	.....	
Connell Ditch	A 459	.....	.5	400.00	1914	.5	40	30	.....	.....	Private
	Total	.....	12.4	$ 4125.00	.....	9.9	1155	465	670	.....	
FLOOD WATER											
Arner Ditch	A 1289	†	.....	.....	1914	.....	.....	.....	10	.....	
INDIAN CREEK											
I. Seegrist	D 489	1894	1.	$ 150.00	1914	1.	15	15	3	.....	Private
Honnold-Wilson Ditch	A 1199†	1913	.3	.....	1914	.3	6	.....	6	.....	
Flood Ditch	D 460	.....	.....	.....	c	.....	.....	.....	.....	.....	Obliterated
Boyer Ditch	A 559	.....	.1	.....	1914	.1	30	00	.....	.....	
Kaiser Ditch	A 540	o	.....	.....							
	Total	.....	1.4	$ 150.00	.....	1.4	51	15	9	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER—(Continued)

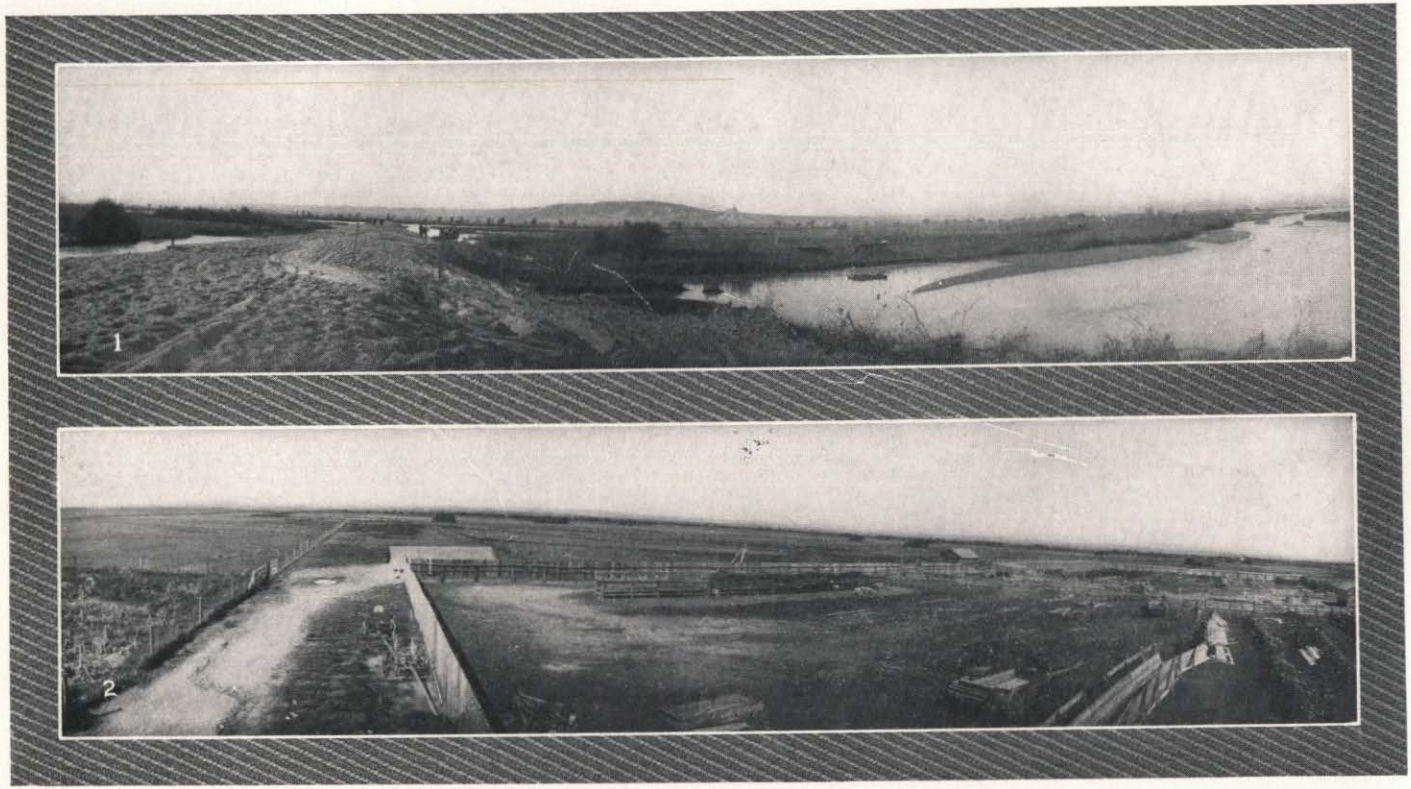
	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
DRY DRAW											
G. Earnest Ditch	A 1061	.....	.....	.....	.....	.....	.....	.....	.....	.....	
TRUNK BUTTE CREEK											
Amock's Ditch	D 465	1893	.5	$ 155.00	1900	.....	5	.....	.....	.....	
Snyder's Ditch	A 1368*	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	.5	$ 155.00	.....	.....	5	.....	.....	.....	
DEAD HORSE CREEK											
Goff Ditch	D 457	1894	.8	$ 100.00	1895	.....	10	.....	.....	.....	
J. Kemery†	D 493	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Flagg Butte Ditch	D 427	1891	.3	50.00	1908	.....	15	.....	.....	.....	
J. Harley†	D 488	1894	.5	115.00	1896	.....	.....	.....	.....	.....	
Geiser Ditch†	A 658	1902	.1	50.00	1903	.....	.....	.....	.....	.....	
Roy. A. Slattery	A 749	1886	1.	1000.00	1914	1.	90	60	80	.....	Private
T. L. Goff	D 441	1891	.1	265.00	1914	.1	15	15	.....	.....	Private
	Total	.....	2.8	$ 1580.00	.....	1.1	130	75	80	.....	
CHADRON CREEK											
Tug Wilson's Ditch	D 453	1893	.7	$ 575.00	1908	m	50	.....	.....	.....	
Wallace Wilson Ditch	D 454	1893	.6	300.00	1904	.....	25	.....	.....	.....	
Half Diamond E. Ditch	D 468	1894	1.5	.....	e	.....	40	.....	.....	.....	
Gallup's Ditch	D 426	1890	.3	100.00	1892	.....	14	.....	.....	.....	
	Total	.....	3.1	$ 975.00	.....	0.0	129	.....	.....	.....	
LONE TREE CREEK											
Thomas Ditch	A 789	1905	1.5	$ 300.00	e	.....	100	.....	.....	.....	
Beam Ditch	A 1346	1914	dam	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	1.5	$ 300.00	.....	.....	100	.....	.....	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
DRY RUN CREEK											
Campbell's Ditch	A 919	o	.....	.....	.....	.....	.....	.....	.....	.....	
Wm. Guse	A 1345	u	.....	.....	.....	.....	.....	.....	.....	.....	
Marsh & Weston	A 1361	u	.....	.....	.....	.....	.....	.....	.....	.....	
CANYON TO WHITE RIVER											
Schwabe Ditch	A 908	1908	.5	$ 50.00	1914	.5	125	100	.....	$ .35	Private
RUSH CREEK											
Braddock Ditch	A 706	1902	1.	$ 500.00	1914	1.	360	300	.....	1.00	Private
Braddock's Extension	A 825	1906	.5	.....	1914	.5	.....	.....	.....	.....	c- A706
	Total	.....	1.5	$ 500.00	.....	1.5	360	300	.....	.....	
MADDEN CREEK											
F. Flannigan	A 763	1904	Δ	$ 1000.00	1914	.....	25	25	.....	1.25	Private
O. R. Flannigan	A 771	1905	.5	1000.00	1911	n	200	.....	.....	.....	
Trier Ditch	A 830	1906	.5	.....	1912	n	60	30	.....	.....	
	Total	.....	1.0	$ 2000.00	.....	.....	285	55	.....	.....	
BORDEAUX CREEK											
Locket Ditch	D 494	†	.2	$ 25.00	c	.....	.....	.....	.....	.....	
Adams Ditch	D 450	.....	.1	75.00	1905	.....	10	.....	.....	.....	
Richards Ditch	D 430	1890	.5	50.00	1911	.....	35	.....	35	.....	
Richards Ditch	D 446	1892	.7	265.00	c	.....	25	.....	.....	.....	
Burn's Ditch	A 584	1900	1.2	10000.00	1904	.....	400	.....	.....	.....	(4)
Mann's Ditch	D 975	1893	.5	100.00	1902	.....	10	.....	.....	.....	
County Ditch	D 983	†	.....	.....	.....	.....	.....	.....	10	.....	
Nelson's Ditch	A 478	1879	.6	1000.00	1908	.....	25	.....	.....	.....	

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Nelson's Irrigation Plant	A 494	o	.....	.....	.....	.....	.....	.....	.....	.....	
Bryant's Ditch	D 434	1891	.8	250.00	1914	.5	50	3	.....	1.50	Private
Morrisey Canal	D 491	†	.2	100.00	.....	.....	10	.....	10	.....	
Hall's Ditch	D 437	1891	.3	60.00	1902	.....	5	.....	.....	.....	
Marten's Ditch	A 690	†	.....	.....	.....	.....	.....	.....	.....	.....	
Bacon's Ditch	D 445	1894	.5	200.00	1906	.....	30	.....	15	.....	
Marten's Ditch	A 848	†	.....	.....	.....	.....	.....	.....	50	.....	
O'Donnell's Ditch	A 432	†	.2	.....	.....	.....	10	.....	20	.....	Private
	Total	.....	5.8	$ 12125.00	.....	.5	610	3	140	.....	
LITTLE BORDEAUX CREEK											
Collins Reservoir	A 780	1904	.7	$ 200.00	1914	.7	30	10	24	1.00	Private
Butler Ditch	D 443	1894	.2	100.00	1914	.2	35	8	8	2.00	Private
Frady Ditch*	D1009	1900	.7	175.00	1907	a	25	.....	.....	.....	
Good Ditch	A 783	1905	1.5	350.00	1907	.....	65	.....	.....	.....	
Hartzell's Ditch	D 448	1893	.7	260.00	1914	.7	75	40	40	.60	Private
	Total	.....	3.8	$ 1085.00	.....	1.6	230	58	72	.....	
CANYON TO WHITE RIVER											
Marten's Ditch	A 696	.....	1.	.....	†	.....	15	.....	20	.....	
BEAVER CREEK											
Rickman Ditch	A 681	1902	.7	$ 100.00	1914	.7	90	75	90	.....	Private
Cilek Ditch	A 513	1899	.3	150.00	1906	m	40	.....	.....	.....	
Stastney Ditch	A 330	1895	.7	100.00	1907	.....	30	.....	.....	.....	
Hyser Ditch	A 303	1896	.3	200.00	1899	.....	.....	.....	.....	.....	Cancelled
Braddock Ditch	D 423	1895	1.	700.00	1914	1.	75	75	72	.....	Private



(1) VIEW OF FILL TO BAYARD STATE AID BRIDGE
(2) VIEW OF FEED YARDS AND ALFALFA FIELD, WESTERN NEBRASKA

STATUS OF THE CANALS ALONG THE TRIBUTARIES OF WHITE RIVER—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
J. F. Braddock	D 974	1897	1.5	1050.00	1914	1.5	75	75	60	.....	Private
Braddock Ditch	A 463	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D974
Lockler Ditch	D1017	1892	1.	550.00	1914	1.	150	150	.....	.....	Private
	Total	.....	5.5	$ 2850.00	.....	4.2	460	375	222	.....	
SHERIDAN CREEK											
Getchell Ditch	D 419	†	.5	$ 100.00	.....	.....	.....	.....	.....	.....	
WHITE CLAY CREEK											
Pine Ridge Irrigation Ditch	D 418	†	2.6	$ 4155.00	1914	2.6	470	.....	470	.....	U. S. Indian Service
Brook's Ditch	A 1120	†	.....	.....	.....	.....	.....	.....	.....	.....	
Townsend Ditch	A 1054	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	2.6	$ 4155.00	.....	2.6	470	.....	470	.....	

Δ Dams.
* Water right pending.
† No further information available.
✦ Maintenance and operation.
c Ditch not used for years.
m Dam washed out that year.
n Dam washed out the following season.
d An additional water right for ditch (number).
e An extension to ditch (number).
u Ditch still under construction.
o No construction work done.
s No water ever diverted from the stream.

(1) Ditch was never used, water supply diverted from Saw Log Creek.
(2) Simply ploughed out ditches along the hillside and caugh t storm water.
(3) Water for land under D473 now carried through ditch A788.
(4) Sewer pipe laid for ditches produced the high cost.

IRRIGATION FROM HAT CREEK AND ITS TRIBUTARIES

The irrigated areas along Hat creek and its tributaries lie in scattered tracts in the bottoms. The West Hat Creek Ditch, built by B. E. Brewster in 1880, was the first irrigation enterprise undertaken in the northwestern portion of the state. The C. F. Coffee Ditch was built by C. F. Coffee during the following year. Many ditches were built along the various streams tributary to Hat creek during the succeeding years and one ditch was recently completed. The flow of each of these streams is small and some of the streams are dry during the summer. These streams are all over-appropriated and during the later summer months the flow is nearly all used for domestic and stock purposes and but little water can be diverted for irrigation. The country is very rough and no large system to cover a considerable area will be constructed owing to the high cost of construction and the shortage of the water supply during the summer months. Many more acres could be brought under irrigation by the construction of reservoirs to store the spring floods.

There are seven existing appropriations from Hat creek, totaling 13.23 second-feet. One appropriation has not been used during the past ten years, but the others were used during 1914. Seven ditches have been built along Hat creek, and six were in operation during 1914.

This section of the state is devoted almost entirely to stock raising. While some gardening is done for home use, wild hay and alfalfa are the principal crops grown by irrigation.

The land is owned as stock ranches and the value is determined by this industry, as but a small portion of each ranch, lying along the creek bottoms can be irrigated. The territory drained by Hat creek and its tributaries is located some distance from the railroad and crops could not be grown profitably for the outside markets. Below is given a summary of the canals within this drainage basin:

SUMMARY OF CANALS FROM HAT CREEK AND ITS TRIBUTARIES

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
Hat Creek	7	7.6	1,135	$ 4,610	6	7.3	1,125	305	405
Boggy Creek	6	4.0	390	475	2	2.0	320	15	335
Warbonnet Creek	9	9.0	815	3,880	3	5.5	580	535	378
Tributaries:									
Jim Creek	4	2.6	155	515	3	1.7	125	70	110
Monroe Creek	3	5.2	312	3,445	2	3.5	277	230	157
Sow Belly Creek	8	6.3	550	4,575	4	3.7	470	340	300
Spring Creek	2	1.5	70	600	2	1.2	70	40	30
Prairie Dog Creek	1	.1		100					
Cedar Creek	2	2.0	115	275	2	1.5	115	75	
Little Red Creek	1	.5	20	45	1	.5	20	10	
Total for Warbonnet Creek and Tributaries	36	27.2	2,037	$ 13,435	17	17.6	1,657	1,300	975
Squaw Creek	3	2.9	236	1,275	3	1.4	185	12	148
Plum Creek	1	.3	7	400					
Cherry Creek	1	.4	12	125					
Lickett Creek	2	1.2	140	1,500					
Stream (no name)	2	.8	25	525					
Jim Creek	1	.7	150		1	.7	150	40	60
Antelope Creek	4	3.8	560	2,300	4	3.8	560	120	391
Whitehead Creek	1	.3	5	300					
Canyon to Hat Creek	1			100					
Canyon to Indian Creek	1	1.0	200	800					
Long Branch Creek	2	.7	48	550	1	.4	18	10	15
Total for Tributaries of Hat Creek	57	43.3	3,810	$ 21,785	28	25.9	2,890	1,497	1,924
Total for Basin	64	50.9	4,945	$ 26,395	34	33.2	4,015	1,802	2,329

STATUS OF THE CANALS ALONG HAT CREEK AND ITS TRIBUTARIES

The following table shows the status of the canals from Hat Creek and its tributaries:

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
HAT CREEK											
West Hat Creek Ditch	D 553	1880	1.3	$ 110.00	1914	1.3	100	70	.....	$ .35	Private
Antrim Ditch	A 594	1900	1.	300.00	1914	1.	40	25	40	1.00	Private
Antrim Dam	A 834	1909	.5	500.00	1914	.5	40	10	40	.....	Private
C. F. Coffee Ditch	D 512	1881	3.	3000.00	1914	3.	500	200	325	1.20	Private
Miller Ditch	A 341	1896	.5	400.00	1914	.5	25	0	.....	.....	Private
Coffee & Son Ditch	A 1236	1913	1.	.....	1914	1.	420	0	.....	.....	
Haas Ditch	A 510	1899	.3	300.00	1902	m	10	.....	.....	.....	
	Total	.....	7.6	$ 4610.00	.....	7.3	1135	305	405	.....	
BOGGY CREEK											
Martin's Ditch†	A 342	.....	.5	.....	c	.....	25	.....	15	.....	
Bannon's Ditch†	D 560	1886	.5	$ 125.00	.....	.....	5	.....	.....	.....	
Wickersham Ditch	A 701	1905	1.5	.....	1914	1.5	260	.....	260	.....	Private
Smith Ditch†	D 526	1892	.5	250.00	.....	.....	30	.....	.....	.....	
Thos. Holly†	D 956	1887	.5	.....	.....	.....	10	.....	.....	.....	
Hill Irrigation Ditch	A 886	1908	.5	100.00	1914	.5	60	15	60	1.50	Private
	Total	.....	4.0	$ 475.00	.....	2.0	390	15	335	.....	
WARBONNET CREEK											
Garton Ditch	D 503	1893	.7	$ 235.00	1908	.....	100	.....	.....	.....	
Kay's Ditch	D 958	1887	.6	100.00	1908	.....	10	.....	.....	.....	
J. Anderson	D 539	1889	1.	200.00	1908	.....	70	.....	.....	.....	
Nolan Ditch No. 1	D 957	1887	.2	50.00	1912	.....	5	5	1	2.00	
Nolan Ditch No. 2	D 959	1888	.5	300.00	1912	.....	25	10	20	1.00	
Biehle Ditch	D 538	1891	.5	245.00	1908	.....	25	.....	.....	.....	

SUMMARY OF CANALS FROM HAT CREEK AND ITS TRIBUTARIES—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Warbonnet Ditch No. 2	A 892	1908	2.	1000.00	1914	2.	120	100	104	.75	Private
Warbonnet Ditch No. 3	A 1369	1912	1.5	750.00	1914	1.5	160	160	.....	.....	Private
Warbonnet Ditch	D ..8	1878	2.	1000.00	1914	2.	300	260	254	1.00	Private
	Total	.....	9.0	$ 3880.00	.....	5.5	815	535	378	.....	
JIM CREEK—A tributary of Warbonnet Creek											
Woodruff's South Ditch	D 536	1890	.9	$ 170.00	†	.....	30	.....	.....	.....	Cancelled
Slattery Ditch	D 543	1892	.7	145.00	1914	.7	20	20	20	.....	Private
Dout Bros. Ditch	D 981	1889	.7	100.00	1914	.7	65	30	60	1.50	Private
Jim Creek Ditch	D 502	1891	.3	100.00	1914	.3	40	20	30	.50	Private
	Total	.....	2.6	$ 515.00	.....	1.7	155	70	110		
MONROE CREEK—A tributary of Warbonnet Creek											
Noreisch's Ditch	A 83	†	.....	.....	c	.....	.....	.....	.....	.....	
Big Monroe Creek Ditch	D 506	1888	2.	$ 300.00	1914	1.	120	80	.....	.50	Private
Schilt's Monroe Creek	D 509	1888	.7	145.00	†	.....	35	.....	.....	.....	
Wooden Shoe	A 1377*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Neil Jordan Ditch	A 841	1906	2.5	3000.00	1914	2.5	157	150	157	.....	Private
C. Jordan	A 1375*	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	5.2	$ 3445.00	.....	3.5	312	230	157	.....	
SOW BELLY CREEK—A tributary of Warbonnet Creek											
Nutto Ditch	A 404	1893	.5	.....	1909	m	30	.....	.....	.....	
Barne's Reservoir	A 1268	1913	dam	$ 1500.00	.....	.....	.....	.....	.....	.....	
Carroll Ditch	A 516	†	.3	50.00	c	.....	10	.....	.....	.....	

STATUS OF THE CANALS ALONG HAT CREEK AND ITS TRIBUTARIES—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Old Sow Belly Ditch	D 533	1884	1.5	1475.00	1914	1.5	300	200	200	$ .75	Private
O'Connell Canal	A 1288*	1913	1.	.....	.....	.....	.....	.....	.....	.....	
Zimmerman Ditch	A 532	1900	.5	200.00	1914	.5	70	50	.....	.66	Private
Montgomery Ditch	D 559	1890	1.	250.00	1914	1.	70	70	70	1.50	Private
Jordan Ditch	D 556	1894	1.5	500.00	1914	.7	30	20	.....	1.25	Private
Jordan Ditch	A 424	1902	.....	600.00	1910	.....	40	.....	30	.....	
Jordan Ditch	A 668	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A424
	Total	.....	6.3	$ 4575.00	.....	3.7	550	340	300	.....	
SPRING CREEK—A tributary of Sow Belly Creek											
Spring Creek Ditch	D 532	1892	.5	$ 200.00	1914	.5	30	.....	30	.....	(1)
Hall's Spring Creek Ditch	D 550	1889	1.	200.00	1914	.7	40	40	.....	.40	Private
	Total	.....	1.5	$ 400.00	.....	1.2	70	40	30	.....	
PRAIRIE DOG CREEK—A tributary of Sow Belly Creek											
Schilt's Prairie Dog Ditch	D 508	1895	.1	$ 100.00	1914	.1	.....	.....	.....	.....	(2)
CEDAR CREEK—A tributary of Prairie Dog Creek											
John Plunkett	D 985*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Valdez Ditch	D 976	1886	.5	$ 150.00	1914	.5	35	35	.....	.35	Private
Schilt's C. Creek Ditch	D 507	1885	1.5	125.00	1914	1.	80	40	.....	.25	Private
	Total	.....	2.0	$ 275.00	.....	1.5	115	75	.....	.....	

STATUS OF THE CANALS ALONG HAT CREEK AND ITS TRIBUTARIES—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O.	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	1912	
SQUAW CREEK											
Dunn's Ditch	D 552	1891	.2	$ 125.00	1914	.2	125	.....	123	.....	Private
Hamlin's Ditch	D 555	1889	.5	50.00	1902	.....	1	.....	.....	.....	
Thos. Dunn's Ditch	A 100	1897	1.	700.00	1910	.....	50	.....	.....	.....	
Thomas Ditch	A 627	1898	.5	200.00	1914	.5	35	12	.....	.....	Private
Phillip Dunn's Ditch	A 376	1899	.7	200.00	1914	.7	25	.....	25	.....	
	Total	.....	2.9	$ 1275.00	.....	1.4	236	12	148	.....	
LITTLE RED CREEK—A tributary of Prairie Dog Cr.											
Zerbst Ditch	D 551	1893	.5	$ 45.00	1914	.5	20	10	.....	.....	Private
PLUM CREEK											
Plum Creek Ditch	A 784	1905	.3	$ 400.00	1911	.....	7	.....	.....	.....	Cancelled
CHERRY CREEK											
Cherry Creek Ditch	D 549	1893	.4	$ 125.00	1911	.....	12	.....	.....	.....	
LICKETT CREEK											
Lickett Ditch†	A 549	1900	.5	$ 500.00	.....	.....	100	.....	.....	.....	
Lickett Ditch†	D1005	1887	.7	1000.00	1912	.....	40	15	.....	.....	
	Total	.....	1.2	$ 1500.00	.....	.....	140	15	.....	.....	
STREAM—(No name)											
Hunter Ditch†	A 451	1898	.5	$ 500.00	1912	.....	10	7	.....	1.00	
Homestead Ditch	D 984	1891	.3	25.00	1902	.....	15	.....	.....	.....	
	Total	.....	.8	$ 525.00	.....	.....	25	7	.....	.....	

STATUS OF THE CANALS ALONG HAT CREEK AND ITS TRIBUTARIES—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
JIM CREEK											
Wassenberger Ditch	A 581	1900	.7	.....	1914	.7	150	40	60	.....	
ANTELOPE CREEK											
Ellis Ditch†	A 338	.....	.5	.....	1912	.5	20	.....	10	.....	
Turner Ditch†	D 537	1894	2.	$ 1000.00	1914	2.0	60	60	60	.....	Private
Story's Ditch	A 168	1896	1.	300.00	1914	1.0	300	60	300	.....	Private
Gayhart Ditch	A 760	1902	.3	1000.00	1914	.3	180	.....	21	.....	
	Total	.....	3.8	$ 2300.00	.....	3.8	560	120	391	.....	
WHITEHEAD CREEK											
Harrison Ditch	D 547	1888	.3	$ 300.00	1912	.....	5	5	.....	.....	
CANYON TO HAT CREEK											
Konrath Ditch	A 808	1906	dam	$ 100.00	†	.....	.....	.....	.....	.....	
CANYON—Tributary to Indian Creek											
Hibbeln Ditch	A 872	1900	1.	500.00	1912	.....	100	5	.....	.....	
Meier Dam	A 585	1904	dam	300.00	1912	.....	100	50	.....	1.00	
	Total	.....	1.	$ 800.00	.....	.....	200	55	.....	.....	

BRIDGEPORT STATE AID BRIDGE, NORTH PLATTE RIVER, SHOWING OLD BRIDGE ALSO

STATUS OF THE CANALS ALONG HAT CREEK AND ITS TRIBUTARIES—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
LONG BRANCH CREEK											
Long Branch Reservior	A 1371*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Ebert Ditch†	A 635	1901	.3	.....	.....	.....	10	.....	.....	.....	
Borby Dam	A 557	1899	dam	$ 50.00	1908	m	20	.....	.....	.....	
O'Connell Ditch	A 587	1900	.4	500.00	1914	.4	18	10	15	.....	
	Total	.....	.7	$ 550.00	.....	.4	48	10	15	.....	
DRY GULCHES											
Roy C. Childs	A 1376*	†	.....	.....	.....	.....	.....	.....	.....	.....	

* Water right pending.
† No further information available.
✦ Maintenance and operation.
c Ditch not used for years.
m Dam washed out that year.
d An additional water right for ditch (number).
(1) A second point of diversion and water right for ditch D533.
(2) A second point of diversion and water right for ditch D507.

IRRIGATION IN THE LOUP RIVER DRAINAGE BASIN

During the dry years of 1891 to 1894 crops in the valleys of the Loup river and its tributaries were complete failures and the farmers, not knowing much about the practice of irrigation, entered into almost any scheme whereby they could obtain water for the production of crops. During this time, many enterprises were undertaken and carried to completion This section of the State is located in the Sand Hill region, and was settled principally by cattlemen. In 1898 and the succeeding years stockmen were able to raise sufficient feed to winter their stock without irrigation, and as but very few farmers in this section ever attempted to grow produce for outside markets at the time, all the irrigation enterprises with very few exceptions were abandoned.

The following table shows the decline of irrigation along Loup River and its tributaries:

SUMMARY OF CANALS IN THE LOUP RIVER DRAINAGE BASIN

	Canals Built				Canals Operated, 1914			Acreage	Acreage
	No.	Mileage	Acreage Covered	Cost	No.	Mileage	Acreage Covered	Irrigated 1912	1914 Reported
South Loup River	4	2.9	416	$ 6,000	1	.....	300	.....	300
Muddy Creek	1	.2	30	300	.....	.....	.....	.....	.....
Total	5	3.1	446	$ 6,300	1	.....	300	.....	300
Middle Loup River	11	98.7	32,511	$ 158,350	2	4	761	150	691
Barton Creek	1	2.0	.....	.....	.....	.....	.....	.....	.....
Victoria Creek	2	6.0	250	5,775	.....	.....	.....	.....	.....
Total	14	106.7	32,761	$ 164,125	2	4	761	150	691
North Loup River	6	68.0	26,900	$ 89,850	.....	.....	.....	.....	.....
Cow Creek	1	2.0	100	285	.....	.....	.....	.....	100
Goose Creek	3	9.5	1,400	1,775	1	3	600	250	410
Gracie Creek	1	.6	20	2,000	.....	.....	.....	.....	20
Total	11	80.1	28,420	$ 93,910	1	3	600	250	530
Loup River	1	11.0	.....	50,000	.....	.....	.....	.....	.....
Cedar River	1	10.00	.....	50,000	.....	.....	.....	.....	.....
Beaver River	1	2.0	300	1,400	.....	.....	.....	.....	.....
Spring Creek	1	.3	30	50	.....	.....	.....	.....	.....
Looking Glass Creek	1	.5	.....	250	.....	.....	.....	.....	.....
Shell Creek	1	.6	120	600	1	.6	120	.....	95
Total	6	24.4	450	$ 102,300	1	.6	120	.....	95
Total for Loup drainage basin	36	214.3	62,077	$ 366,635	5	7.6	1,781	400	1,616

CANALS ALONG THE LOUP RIVER

GREAT EASTERN CANAL (A-219b). The first filing for this project was made by an individual, but shortly afterwards the Nebraska Irrigation Company was organized and additional filings covering both irrigation and the development of water power made. This company built four miles of main canal in 1896. In 1897 an extension of 4½ miles and a distributing system were built, and in 1901 another extension of 3½ miles was made to the main canal. The company claims to have built 63 miles of canals at a cost of $275,000. This mileage must have included everything down to the smallest farm laterals. The cost also does not seem to agree with the testimony submitted before the state board of irrigation, which showed that 476,000 cubic yards of material were moved in the construction of the canal and laterals and that this work was done by contract at 6 cents per cubic yard.

Water was run through the canal for several years and during 1901 a maximum of 2,870 acres were irrigated. This is one of the most eastern canals in the United States. In fact it is located so far east in the belt where the rainfall is usully sufficient to produce excellent crops that it was never a success and after a number of years its use for irrigation purposes was practically abandoned. The headgates and many of the structures are either gone or in a state of collapse, the ditch filled in places, and a dam across Beaver creek was dynamited in 1905. There is a small orchard of 25 acres lying below this canal that was irrigated in 1912, but the water supply was obtained from Lost creek.

The following table shows the status of canals from Loup river and its tributaries:

STATUS OF THE CANALS ALONG THE LOUP RIVER AND ITS TRIBUTARIES

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
LOUP RIVER											
New York Canal	A 291	o	.....	.....	.....	.....	.....	.....	.....	.....	
Great Eastern Canals	A 219b	1896	11.	$ 50000.00	c	.....	.....	.....	.....	.....	
	Total	.....	11.	$ 50000.00	.....	.....	.....	.....	.....	.....	
CEDAR RIVER											
Cedar River Canal..... †	D 221	1894	10.	$ 50000.00	1895	.....	.....	.....	.....	.....	
BEAVER RIVER											
Pioneer Ditch	D 287	1894	2.	$ 1200.00	1904	.....	300	.....	.....	.....	
Windmill Irrigation	A 277	1896	(1)	200.00	†	.....	.....	.....	.....	.....	
Great Eastern Canal	A 219b	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A219b-Loup River
	Total	.....	2.	$ 1400.00	.....	.....	300	.....	.....	.....	
SPRING CREEK											
Hendrix Ditch	D 290	1892	.3	$ 50.00	†	.....	30	.....	.....	.....	
LOOKING GLASS CREEK											
Great Eastern Canal	A 219b	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A219b-Loup River
Monroe Irrigation Ditch	D 289	.....	.5	$ 250.00	†	.....	.....	.....	.....	.....	
	Total	.....	.5	$ 250.00	.....	.....	.....	.....	.....	.....	

STATUS OF THE CANALS ALONG THE LOUP RIVER AND ITS TRIBUTARIES—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
SHELL CREEK											
Gottreberg Irrigation Plant	A 2	†	.....	.....	.....	.....	.....	.....	.....	.....	
Schmitt's Irrigation Canal	D 292	1895	.6	$ 600.00	1914	.6	120	.....	95	.....	
Great Eastern Canal	A 2191	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- A2191-Loup River
	Total	.....	.6	$ 600.00	.....	.6	120	.....	95	.....	
SLOUGH											
Novotny Ditch	A 1327*	†	.....	.....	.....	.....	.....	.....	.....	.....	

* Water right pending.
† No further information available.
✦ Maintenance and operation.
c Ditch not used for years.
d An additional water right for ditch (number).
o No construction work done.
(1) A windmill was used to elevate water from the river.

CANALS ALONG THE NORTH LOUP RIVER

NEWTON IRRIGATION DITCH (D-205). A company organized upon a mutual or co-operative plan started this project, but after the irrigation law of 1895 went into effect an irrigation district was organized and bonds in the sum of $20,000 were voted. The district was unable to dispose of the bond issue and the board of directors finally used them in payment for labor on construction. About 16 miles of canal were constructed during 1896. Landowners, who opposed the organization of the district, attacked the bond issue, claiming that the bonds were illegally disposed of and that the prices charged for construction were exorbitant. The district court finally decreed that the bonds were legal and had to be paid. It is stated that if cash had been available for the payment of claims all bills could have been discounted at least 25 per cent. No attempt has been made during the last 12 or 14 years to operate this canal.

BURWELL IRRIGATION DITCH (D-224). The Burwell Irrigation Company was incorporated on November 1, 1894, and acquired the rights that had been previously obtained by other parties. Construction work was begun in the fall of 1894 and during 1895, twelve miles of canal, covering 7,000 acres, were built at a cost of $24,000. The funds for the construction were received from the following sources: The sale of stock of the company; $8,500 in bonds, voted by one precinct of Garfield county; and from a bond issue of $10,000 floated by the company in 1896. Two large flumes were built, but later one was replaced by an earth fill with a culvert to take care of the natural drainage. The other, which was built across Sioux creek and was very expensive to maintain, washed out three or four times before the canal finally was abandoned. The construction of the main canal was done by contract but the farmers were required to build their own laterals.

No water rights were sold. The company made two contracts, one for one year and one for five years, with the water users. The annual charge was $1.25 per acre in the 1-year contract, and $1.00 in the 5-year contract. Contracts for 2,000 acres were signed and this was the maximum acreage irrigated.

Water was first used in 1895. During the growing season of that year the rainfall in this locality was above normal. The rainfall during the succeeding years was such that the farmers have been able to raise crops independent of irrigation. The farmers refused to patronize the canal, the company finally became involved, and about the year 1900 the bondholders foreclosed on the canel. It was sold later to a private party for $1,500 and after four years of attempted operation the canal was abandoned.

NORTH LOUP DITCH (D 227, 228, 232). In 1893 the North Loup

Irrigation and Improvement Company was organized, with a capital stock of $50,000. During the fall of 1893, 14 miles of canal, heading just below the town of Ord, were constructed and during 1894 water was diverted and run through the canal and some land irrigated.

The company was aided in construction by one precinct of Valley county, which voted and issued $10,000 in bonds. No water rights were sold, but the company rented water to the farmers at an annual flat rate of $1.25 per acre. This canal covered about 8,000 acres, and during the first few years of operation a maximum of 2,000 acres were brought under irrigation, but after 8 years of more or less indifferent operation the canal was abandoned. No provision was made to take care of the shifting sands of the river, and when the canal was operated large quantities were deposited in the upper portion. In addition, the company would not provide funds for cleaning the canal, and this work had to be done by farmers who were paid for the work in script which could be used to make payments on contracts. After the canal had been operated for several years, control of it was obtained by three individuals who operated it for several seasons. Later some of the bondholders purchased a controlling interest and attempted to operate the canal, but unfortunately an inexperienced man was placed in charge and the money set aside for repairs and improvements was spent without results. They finally disposed of their interest and the bondholders foreclosed and the ditch was sold. Meanwhile the farmers had stopped using the water and the canal was allowed to fall into disuse and in places was plowed up and filled in.

The following table shows the status of the canals along the North Loup river and its tributaries:

LOUP CITY STATE AID BRIDGE, MIDDLE LOUP RIVER

STATUS OF THE CANALS ALONG THE NORTH LOUP RIVER AND ITS TRIBUTARIES

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
NORH LOUP RIVER											
Lee Ditch	D 188	1895	2.	$ 850.00	1902	.....	300	.....	.....	.....	
Lee Ditch	D 189	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D188
State Central Ditch	A 152	1895	15.	10000.00	1896	.....	3600	.....	.....	.....	
Homestake Irrigation Canal	A 1210*	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Newton Irrigation Ditch	D 205	1896	13.	20000.00	1900	.....	8000	.....	.....	.....	
Tzschuck Canal	A 301	1894	12.	†	1902	.....	.....	.....	.....	.....	
Burwell Irrigation Ditch	D 224	1894	12.	24000.00	1904	.....	7000	.....	.....	.....	
North Loup Ditch	D 227	1893	14.	35000.00	1900	.....	8000	.....	.....	.....	
North Loup Ditch	D 228	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D227
North Loup Ditch	D 232	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D227
	Total	.....	68.	$ 89850.00	.....	.....	26900	.....	.....	.....	
COW CREEK											
Homestead Ditch	D 194	1894	2.	$ 285.00	1901	.....	100	.....	100	.....	
GOOSE CREEK											
Giles Ditch	D 187	1895	3.5	$ 575.00	1913	3.	600	250	410	.....	
Erickson Ditch	D 209	1895	3.	500.00	1898	.....	400	.....	.....	.....	
Crook Ditch	A 345	.....	3.	700.00	†	.....	400	.....	.....	.....	
	Total	.....	9.5	$ 1775.00	.....	3.	1400	250	410	.....	
GRACIE CREEK—A tributary of Calamus River											
Gracia Highline	A 397	1894	6.	$ 2000.00	1897	.....	20	.....	20	.....	
DRY CREEK– A tributary of Calamus River											
Fisher Canal	A 807	o	.....	.....	.....	.....	.....	.....	.....	.....	

STATUS OF THE CANALS ALONG THE NORTH LOUP RIVER AND ITS TRIBUTARIES—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
DAVIS CREEK											
Frank Koupal	A 1207	†	.....	.....	1914	.....	.....	.....	1c	.....	
MIRA CREEK											
Mira Reservoir	A 1182	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Mira Reservoir	A 1239	†	.....	.....	1914	.....	.....	.....	90	.....	

* Water right pending.
† No further information available.
✦ Maintenance and operation.
d An additional water right for ditch (number).
o No construction work done.

CANALS ALONG THE MIDDLE LOUP RIVER

LILLIAN PRICINCT DITCH (D 204). A company was organized in 1894 and construction work was started on the canal. Some time during the latter part of 1896, the farmers residing under the proposed project organized an irrigation district and took over the project. Bonds in the sum of $32,000 were voted, but the district was unable to float them and no money was raised. Finally the promoters of the project accepted the entire issue in payment for the project, agreeing to complete it, which they did in 1899. Twenty-two miles of the canal were completed and one large flume was built across Victoria Creek. Water was run through the ditch in 1896 for a distance of 15 miles. The last attempt at operation was in 1900 when water was run for a short distance at the upper end.

SHERMAN COUNTY CANAL (D-229). A company was organized and the promotion of the Sherman County Canal was undertaken. Loup City and Logan townships of Sherman county, voted bonds in the sum of $16,000 and $8,000 respectively, and turned them over to the company to aid in the construction. During 1894, the company built 16 miles of canal at a cost of $40,000. The canal crossed many natural water courses and seven flumes were built. Water was run as far as Loup City, but it was impossible to get the farmers to use water, as 18 inches of rain fell during the growing season—April to August, inclusive—and the rainfall for the succeeding years was above the average. The company, not deriving any revenue, was finally forced to abandon the canal.

The following table shows the status of the canals along the Middle Loup River and its tributaries:

STATUS OF THE CANALS ALONG THE MIDDLE LOUP RIVER AND ITS TRIBUTARIES

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
MIDDLE LOUP RIVER											
Nursery Ditches	A 1226	†	.....	.....	1914	.....	70	.....	70	.....	
Norway Irrigation Ditches	D 199	1895	1.	$ 400.00	1897	.....	100	.....	.....	.....	
Thedford Ditch	D 198	1894	12.	8000.00	1897	.....	3000	.....	.....	.....	
Harris Canal	A 248	1896	3.	1200.00	1898	.....	200	.....	.....	.....	
Jewett Ditch	A 113	1895	2.2	1500.00	1901	.....	350	.....	.....	.....	
Middle L. Val. Irrigation Co.	D 202	1894	17.	41625.00	f	.....	.....	.....	.....	.....	
Butcher & Grebble	D 220	1895	4.	1425.00	1899	.....	1200	.....	.....	.....	
Lillian Precinct	D 204	1894	22.	32000.00	1900	.....	4500	.....	.....	.....	
Lillian Precinct	D 216	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D204
Loup Valley Irrigation Canal	A 1294	u	.....	.....	.....	.....	.....	.....	.....	.....	
Bills Lake Canal	A 1308	u	.....	.....	.....	.....	.....	.....	.....	.....	
Lundy Lake Canal	A 1300	u	.....	.....	1914	.....	.....	.....	.....	.....	
Lundy Lake	A 1307	u	.....	.....	.....	.....	.....	.....	.....	.....	
Lundy Lake	A 1306	u	.....	.....	.....	.....	.....	.....	.....	.....	
Wescott Irrigation Ditch	D 214	1894	14.	25000.00	1901	.....	6000	.....	.....	.....	
Webster Canal†	A 442	1898	4.	4000.00	c	.....	.....	.....	.....	.....	
Longwood Irrigation Canal	A 1175	(1)	.....	2200.00	1914	4.	691	150	691	.....	
Sherman County Canal	D 229	1894	16.	40000.00	1898	.....	15000	.....	.....	.....	
Arcadia Canal	A 262	1896	3.5	1000.00	1897	.....	1400	.....	.....	.....	
Lewis Pipe Line	A 1334*	†	.....	.....	.....	.....	.....	.....	.....	.....	
Austin Irrigation Ditch	A 1330*	†	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	98.7	$ 158350.00	.....	4.0	32511	150	761	.....	
BARTON CREEK											
Lewis and Baxter	A 764	1894	2.	†	.....	.....	.....	.....	.....	.....	

STATUS OF THE CANALS ALONG THE MIDDLE LOUP RIVERAND ITS TRIBUTARIES—(Continued)

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
VICTORIA CREEK											
Victoria Irrigation Plant	D 210	1894	4.	$ 5000.00	1906	.....	.....	.....	.....	.....	(2)
Victoria Irrigation Plant	D 212	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D210
Victoria Ditch	D 213	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D212
Laughran & Bell	D 217	1894	2.	775.00	1898	.....	250	.....	.....	.....	
Victoria Ditch	A 1189*	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	6.	$ 5775.00	.....	.....	250	.....	.....	.....	
LILLIAN CREEK											
Lillian Creek Ditch	A 1233	†	.....	.....	.....	.....	.....	.....	.....	.....	

* Water right pending.
† No further information available.
✦ Maintenance and operation.
c Ditch not used for years.
d An additional water right for ditch (number).
f The construction was never completed.
(1) Took possession of the R. O. W. of Webster canal.
u Ditch still under construction.
(2) The Victoria Irrigation Plant was repaired in 1911 but the spring floods of 1912 washed out the flume.

STATUS OF THE CANALS ALONG THE SOUTH LOUP RIVER AND ITS TRIBUTARIES

The following table shows the status of canals from the South Loup River and its tributaries:

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914	
SOUTH LOUP RIVER										
Hartzell Ditch	A 390	1893	.5	$ 500.00	†	.....	26	.....	.....	.....
Brown Canal	A 363	1897	.....	1000.00	1899	.....	20	.....	.....	.....
Boblitz Ditch	D 219	1895	.4	3000.00	1899	m	20	.....	.....	.....
W. J. Flagg Ditch	A 1275	†	.....	.....	1914	.....	300	.....	300	.....
Tillson Ditch	D 236	1894	1.5	1500.00	1896	.....	50	.....	.....	.....
	Total	.....	2.9	$ 6000.00	.....	.....	416	.....	300	.....
MUDDY CREEK										
Penn's Ditch	D 215	1894	.2	$ 300.00	1896	.....	30	.....	.....	.....
SAND CREEK										
J. D. Travers	A 1347*	†	.....	.....	.....	.....	.....	.....	.....	.....
WIGGLE CREEK										
Geo. O. Bender	A 1326*	†	.....	.....	.....	.....	.....	.....	.....	.....

† No further information available.
* Water right pending.
✦ Maintenance and operation.
m Dam washed out that year.

IRRIGATION FROM ELKHORN RIVER

Irrigation was undertaken and practiced during the dry period from 1891 to 1894, during which time all crops were a complete failure. Following this period there has been sufficient rainfall within this drainage basin to produce good crops. Six canals, having a total length of 15.1 miles and covering 9,260 acres, were built at a cost of $20,750.

The following table shows the status of canals from the Elkhorn River and its tributaries:

STATUS OF THE CANALS ALONG THE ELKHORN RIVER AND ITS TRIBUTARIES

	No.	Built		Cost	Operated		Acreage			✦M. & O. 1912	
		Year	Mile		Yr.	Mile	Under Ditch	Irrig. 1912	Repts 1914		
Atkinson M. and Irri. Co	A 443	.....	.2	$ 250.00	c	.....	10	.....	.....	.....	Cancelled
Elkhorn Irrigation Canal	D 259	1894	13.	20000.00	1896	.....	9000	.....	.....	.....	
Elkhorn Irrigation Canal	D 263	.....	.....	.....	.....	.....	.....	.....	.....	.....	d- D259
W. B. Ashton	D 282	Δ	.....	.....	.....	.....	.....	.....	.....	.....	Cancelled
Carlon Ditch No. 2	A 262	1894	1.	200.00	1894	.....	200	.....	.....	.....	
Davis Ditch	D 260	.....	.2	150.00	†	.....	.....	.....	.....	.....	Obliterated
Carlon Ditch No 1	D 261	1894	.7	150.00	1894	.....	50	.....	.....	.....	
N. E. Cain	D 283	o	.....	.....	.....	.....	.....	.....	.....	.....	
	Total	.....	15.1	$ 20750.00	.....	.....	9260	.....	.....	.....	
OAK CREEK											
Eiche Irrigation Plant	A 489	†	.....	.....	.....	.....	.....	.....	.....	.....	

* Water right pending.
† No further information available.
c Ditch not used for years.
d An additional water right for ditch (number).
o No construction work done.
(1) A windmill was used to elevate water from the River.
Δ Canal obliterated.
✦ Maintenance and operation.

ARLINGTON STATE AID BRIDGE, ELKHORN RIVER

WATER POWER

WATER POWER IN NEBRASKA

The first law relating to the use of water for irrigation or water power was passed by the Legislature of 1877. This law was very brief and merely gave to companies desiring to construct such works the right of eminent domain and declared them to be works of internal improvement. No mention whatever was made of any course of procedure whereby title or the right of property to the use of water could be acquired.*

The next legislation covering the use of water was passed by the Legislature of 1889. This act provided the right to acquire the use by appropriation of running water flowing in any river or stream or down any canyon or ravine; provided that the same be used for beneficial or useful purposes, and that when any appropriator or successor in interest ceased to use the water so appropriated for such a purpose the right ceased; that no land was to be burdened by more than one ditch, without the consent of the owner thereof; that all ditches were exempt from taxation; that the point of diversion might be changed if others were not injured; that the water so diverted must be returned to the stream from which it was taken; that as between appropriators the one first in time was first in right; that a notice be posted by the party desiring to appropriate water at the point of intended diversion, stating the point of diversion, the amount of appropriation, the purpose for which claimed, the place of intended use, and the means by which it was intended to divert; that a copy of the notice be recorded in the office of the County Clerk of the county in which the notice was posted; that excavation must commence within sixty days from the time of posting notice and continue to completion; that completion meant conducting the water to the place of intended use; that a permanent right was granted to the use of all water beneficially used through ditches which had previously been completed; that owners of lands bordering on streams were entitled to use of water on adjoining lands; that the right was given for condemnation for right of way; sites for reservoirs; and to enlarge ditches; that ditch c ompanies were authorized to borrow money and issue bonds; that canals constructed for irrigating or water power purposes were declared works of internal improvement; that ditches must be kept in proper repair; and provided a penalty for interfering with ditches of gates.†

*Session Law of Nebraska for 1877, page 168.
†Session Laws of Nebraska for 1889 chapter 68, page 503.

The next law governing the use of water was enacted by the Legislature of 1895, which passed the first comprehensive law regarding and relating to the use of water for irrigation and water power purposes. The most important features of this law as pertaining to water power were as follows: The dedication of the water of every natural stream to public use; the right to divert unappropriated water for beneficial use was never to be denied; stated the priority of the use of water gave preference to the use as follows: first, for domestic uses, second for irrigation and third for power and manufacturing purposes; divided the state into two water divisions and these divisions into districts; provided for the measurment of water in streams; created the State Board of Irrigation; required County Clerks to send certified copies of the notices of all water appropriations on their records to the State Board; provided for the adjudication of existing rights by the State Board; provided for the future applications for appropriations of water; the examination and approval or disallowance of said applications; appeals from the decision of the Board; and a complete record of all water rights to be kept in the office of the State Board.* This law has been amended from time to time and improvement in it made thereby.

The State Board of Irrigation organized itself on April 24, 1895, being composed of the Governor, as president of the Board, the Attorney General and the Commissioner of Public Lands and Buildings. The State Board appointed its secretary, state engineer and other assistants, and at once prepared claim blanks which were sent to water users of record in the offices of the different county clerks, which were filled out and returned to the office of the State Board. Hearings were had on those claims and the rights of the different claimants adjudicated. For convenience in keeping a record of these claims, the hearings were numbered in order in which they were held, and were called "Dockets." Thus all claims for the right to the use of water prior to April, 1895, are known as "Dockets." Special attention is called to this for the reason that it is necessary to know the docket number of a particular water right in order to look it up.

After a hearing on one of these claims which were presided over by the Secretary, an Opinion was rendered by the State Board upon the evidence submitted, which determined the amount of water, the use to which it was applied, the piont of diversion, the location of the project, and the date of priority. These Opinions are bound in book form in the office of the State Board and are final and binding except where appealed from to the District Court.†

For all water rights since April, 1895, the Board upon its organization at once prepared blanks, known as "Application Blanks," which were supplied to persons desiring to obtain a permit for the use of the

*Session laws of Nebraska for 1895 chapter 69, page 244.

†Copies of the claim blanks used for water power purposes together with the complete record of the adjudication of the water right may be found in the office of the State Engineer.

waters of the State of Nebraska. These were filed on the date and hour received at the office of the Board, given a numerical number and recorded. All rights acquired since 1895 are therefore known as "Application No.———." These blanks, among other things, set forth the name of the applicant, his address, the source of the appropriation, amount, and use to which applied. The date of priority to the right to use water under all applications, dates from the filing of the application in the office of the State Board, which is considered the date of priority. These applications are taken up, investigated by the Secretary and acted upon by the Board through the Secretary and either approved or dismissed.

Under the law as it exists at present an applicant feeling himself aggrieved by the action taken by the State Board on his application for a permit to appropriate water, may ask for a hearing before the State Board at which hearing, testimony may be submitted for and against any proposed appropriation, the State Board having the right to summon any witnesses and in all things act as a court rendering a final decision in the matter, from which decision an applicant may appeal directly to the Supreme Court of the State, the same as in cases before the State Railway Commission. Cases pertaining to irrigation and water coming before the Supreme Court are advanced on the Docket, so as to receive prompt consideration.

Upon the allowance of an application the applicant shall begin the actual work of excavation and construction within six months from the date of approval of said application. The application being in fact, simply a permit to the right of the water and no perfected rights are supposed to have been acquired until the project has been completed and the water beneficially used and applied. The work of construction of a power plant must be vigorously, diligently and uninterruptedly prosecuted to completion and one-tenth of the total work must be completed within one year from the date of approval. Also the applicant must file by the tenth of each month a report under oath to the State Board, giving the actual amount of money expended on such power development during the preceding calendar month.

The time for completing the appropriation and applying the water to beneficial use is left to the discretion of the State Board and in most cases a year is allowed after the completion of the construction work for the application of water to beneficial use. When the time for applying the water to beneficial use has expired the aplicant is required to file a proof of appropriation on a blank furnished by the State. This proof of appropriation shows how much water has been applied to beneficial use and the purpose, and is made under oath and attested to by witnesses. Upon receipt of this the Secretary of the Board makes a personal investigation and verifies the proof.

If everything is found to be according to law the Certificate is issued, which certificate grants the applicant the right to the use of

the water which has been applied to the beneficial purpose and the right to the use of the same for as long as the applicant shall apply the same to said beneficial use.

Prior to 1911, ten years' non-use of a water right constituted an abandonment, this being a decision of the Supreme Court. Under the law of 1911, three years consecutive non-use of the water under any water rights constitutes an abandonment and a forfeiture to the State. A water right for irrigation purposes attaches to the land to which it is applied. A water right for power purposes attaches to the project and a relocation of the same which would constitute a new project is not permitted.*

Attention is called to the fact that there are numerous flour mills over the state which have acquired the right to the use of water for power purposes by actual use long before the creation of the State Board, many even before the law of 1877 was passed. Of these there is no record in this office and at the present time many of these plants are putting in generators and developing electric power. Some arrangement should be made whereby these unlisted power developments could be made to become of record in the office of the State Board.

The most valuable water power sites in the state are those on the lower Platte, Loup and Niobrara rivers. The Platte river west of the mouth of the Loup, together with the North and South Plattes, does not play a very important part in the consideration of a study of water power of the state for the reason that all of the water in these streams is used for irrigation purposes, except in extraordinary seasons and for short periods during the winter months.

The Loup River by reason of its uniform flow has for many years attracted promoters looking for water power sites. This is evidenced by the number of filings which have been made on this stream and on the Platte below the point where it receives the waters of the Loup. The first filing for water purposes on the Loup river was made in the year 1895. From this time on, filings covering different projects, utilizing the entire flow of the Loup, with proposed developments made at various points have been made. Many of these filings were in conflict with each other. Many of these were disqualified by reason of non-compliance with the laws, and during the year of 1912, the State Board held numerous hearings, the final outcome of which was to clear up the records of the office, cancelling all applications which were in conflict and leaving a number of large projects free for development. Only the larger and more important of these filings will be discussed here.

Application No. 1077, for one thousand second-feet of water was allowed in 1911 to the Burwell Electric Power Company for a development on the North Loup river at Burwell, Nebraska. The date for completion of the work and applying the water to beneficial use was fixed

*Blanks used for making application for water power purposes, proofs of appropriation, and certificate of appropriation may be had upon application to the State Board.

as September, 1912. A field report under date of 1914 shows that no visible work has ever been done.

Application No. 1373, appropriating one thousand second-feet of water from the Middle Loup river near Boelus, Nebraska, was allowed to the Grand Island Electric Company on July 20, 1914. A recent field report shows that the actual work of construction is now being carried on and that approximately eight thousand cubic yards have been moved. The date for completion of this project is January 15, 1916.

Three aplications asking for twelve hundred second-feet in each instance from the Loup river were filed in this office by H. E. Babcock. Under all three of these it is contemplated to develop power by building a dam across the Loup river and applying the water direct to a turbine. Application No. 1255, is for a power plant and dam located in the Loup river near Palmer; Application No. 1256, another dam in the Loup river near Kent; and Application No. 1257, for another dam in the Loup river near St. Paul. All three of these aplications are now pending before the State Board.

Application No. 709 was allowed on January 30, 1906, to the Nebraska Power Company, for twenty-seven hundred second-feet of water from the Loup river, the intake of the canal being south of Genoa and the development of the power near Columbus where the water was to be returned to the river. The line of the canal under this development follows approximately for a short distance the line of an old irrigation canal. Field reports show that during the past two years this canal has been cleaned out, widened and put into operation for a short time from the intake of the canal to the place where it crosses Beaver Creek, a distance of about four miles at which point a small water power plant was installed consisting of a small generator and small turbine. Current was furnished for a short time to city of Genoa but later discontinued. Field reports indicate that some work has been done during the past year under this application. The original time for completing the construction was September 1st, 1911, and that for applying the water to beneficial use was September 1st, 1912. Under date of November 25, 1912, the Board granted an extension of time of six months or until May 25, 1913. On said date an extension of time of two years was allowed by the Board. From the records of the State Board it would appear that there is no permit allowing the development of any power at Beaver Creek.

Application No. 1029 was filed in this office on the 30th day of September, 1910, by Arnold C. Koenig, asking for a permit to appropriate thirty-two hundred second-feet from the Loup river covering approximately the same location as Application 709. This application was fought through the courts and the Supreme Court finally decided that it belonged to the Nebraska Power Company. It is now pending before the State Board.

Application No. 1187 was allowed November 25, 1912, to the Commonwealth Power Company, appropriating two thousand second-feet

from the Loup river, diversion to be made below the return of the tail waters from Application No. 709, near Columbus, and the same to be returned to the Platte river near Schuyler, where the plant was to be located. The date for completing the appropriation was September 1, 1915. Field reports on this application show that work was commenced near the point of diversion and that approximately three thousand cubic yards were excavated. No work has been done on this for over a year.

Application No. 894 was allowed September 5, 1912, to the Fremont Canal and Power Company and later transferred to the Central Service Corporation which it is understood is owned by Kountze Brothers, Bankers. The grant under this application conveyed the right to divert two thousand second-feet of water from the Platte river, south of Schuyler, on the south side of the river and return the same south of Fremont. The time for completion of the appropriation was September 1, 1915. Field reports indicate that work was begun on this and prosecuted for a short time, about thirty thousand cubic yards being excavated. No work has been done under this project for over a year.

Application No. 970 was granted to Chas. P. Ross on September 2, 1910, with permission to divert 2,500 second-feet of water from the Platte river south of Valley and returning same to the Platte river near the State Fisheries. Application No. 971 was granted to Mr. Ross under the same date with permission to divert five hundred second-feet of water from the Elkhorn river near Waterloo, emptying it into the same canal as under Application No. 970, and returning it to the Platte river near the State Fisheries. Mr. Ross was held up by a contest filed against his right by Wm. J. Coad, which contest was finally dismissed. The original date for completion was September 20, 1914, which time was extended to April 1, 1916. Field reports indicate that some work has been done under these applications.

Application No. 1343 was allowed April 17, 1914, to Chas. C. Parmalee and Carlos A. Rawls of Plattsmouth, granting them a right to divert twelve hundred second-feet of water from the Platte river, near Oreapolis and returning the same near Plattsmouth. The time for completing this application is September 1, 1915. Application No. 1379, made by Parmalee and Rawls covers approximately the same proposition as Application No. 1343 and is now pending before the State Board.

Two of the largest developments of water power in this state which have been accomplished by means of diverting the water through long canals in order to gain head are the ones at Gothenburg and Kearney, Nebraska, on the Platte river. These two developments, approximately in the center of our state, have undoubtedly escaped the attention and notice of a great many of our people who are enthusiastic over water power development in our state.

Docket No. 1023 of the Kearney Water and Electric Powers Company has a right to one hundred forty second-feet of water which is diverted from the Platte river about three miles southeast of Elm Creek

and returns the water near Kearney. This plant has been in operation for a long period of time for power, being used at one time to operate a cotton mill and has been furnishing current to the city of Kearney since about 1886. This canal is approximately twenty-four miles long and is operated throughout the entire year.

Docket No. 645. of the Gothenburg canal, has a right to the use of two hundred second-feet of water from the Platte river which is diverted about fifteen miles northwest of Gothenburg and the water returned to the river near Gothenburg. This plant is very similar to that of the Kearney plant and has been in operation for many years furnishing current to Gothenburg. These are both successful plants and give a person a very good idea of what can be accomplished on the Loup and lower Plattes where the water supply is more plentiful.

The next stream in importance in this state in the study of water power is the Niobrara river. There are proposed on this stream several projects covered by filings in this office. These filings, however, cover only a small portion of the rvier which is better adapted to the construction of power plants than the Loup and Platte rivers owing to the character of the soil and the high bluffs which prevail along the stream. The main reason why power developments have not been made on this stream is the great distance to the market.

Application No. 652 was approved November 13 1902, and granted C. H. Cornell of Valentine, Nebraska, a right to the use of sixteen hundred second-feet of water from the Niobrara river, the project being to build a dam approximately fifty feet in height across the Niobrara river, just below Valentine. The original date for completion and applying the water to beneficial use was January 1, 1907. Later this time was extended to June 11, 1911, by the State Board. Also under date of June 21, 1911, Mr. Cornell filed another petition for further extention of time, which petition is now awaiting the action of the State Board. Field reports indicate that no actual work of excavation has been done but that there are several piles of stone at the proposed site of the dam aggregating 18,460 cubic feet. Quite a bit of engineering work has been done on this and a number of extensive reports made.

Application No. 1243 was allowed to H. P. Buhman of Leigh, Nebraska, on December 16, 1912, allowing him the right to divert nine hundred second-feet of water from the Niobrara river at the bridge across said river south of Spencer and to return the same to the river about twelve miles farther east. The time for completion under this application is July 1, 1915. Field reports indicate that there has been approximately twenty-six hundred cubic yards of earth excavated. Said reports indicate that no work has been done within the past few months.

Application 961 was allowed on February 19, 1910, to E. L. Kirk of Sioux City, Iowa, granting him the right to use nine hundred second-feet of water from the Niobrara river, diverting it about twelve miles southwest of Niobrara and returning it to the river a little southwest of the town of Niobrara, Nebraska. The original time for completion

under this application was May 1st, 1912, and later by the orders of the Board the time was extended to January 1, 1913, and further extended again to January 1, 1915. Field reports indicate that a total of approximately three thousand cubic yards have been excavated, of which one hundred eighty-five yards of earth were moved during 1914.

The next stream for consideration is the Big Blue river which has well defined banks which are comparatively high and while the amount of water is not so great as in some of the other streams of the state, its flow is fairly uniform and this combination affords many small power sites throughout its course. Power on this stream is not developed by means of diversion canals but by building dams directly across the stream and impounding the water and applying it at heads varying from ten to twenty-five feet. The cost of this style of development is less expensive and a number of small power plants have been developed and are now in operation along this stream, the more important of which will be enumerated.

Application No. 1006, allowed on August 5, 1910, to Burdette Boyes, permitting him to use two hundred second-feet of water from the Big Blue river about four miles southeast of Milford. The plant has been completed and in operation for over two years and is furnishing current to several small towns in the vicinity including Milford and Seward.

Application No. 1035 was allowed on October 31, 1910, to Edmund J. Ashton, granting him the right to use five hundred second-feet of water from the Big Blue river, near the junction of the main Blue and the West Fork. No work has ever been done under this application.

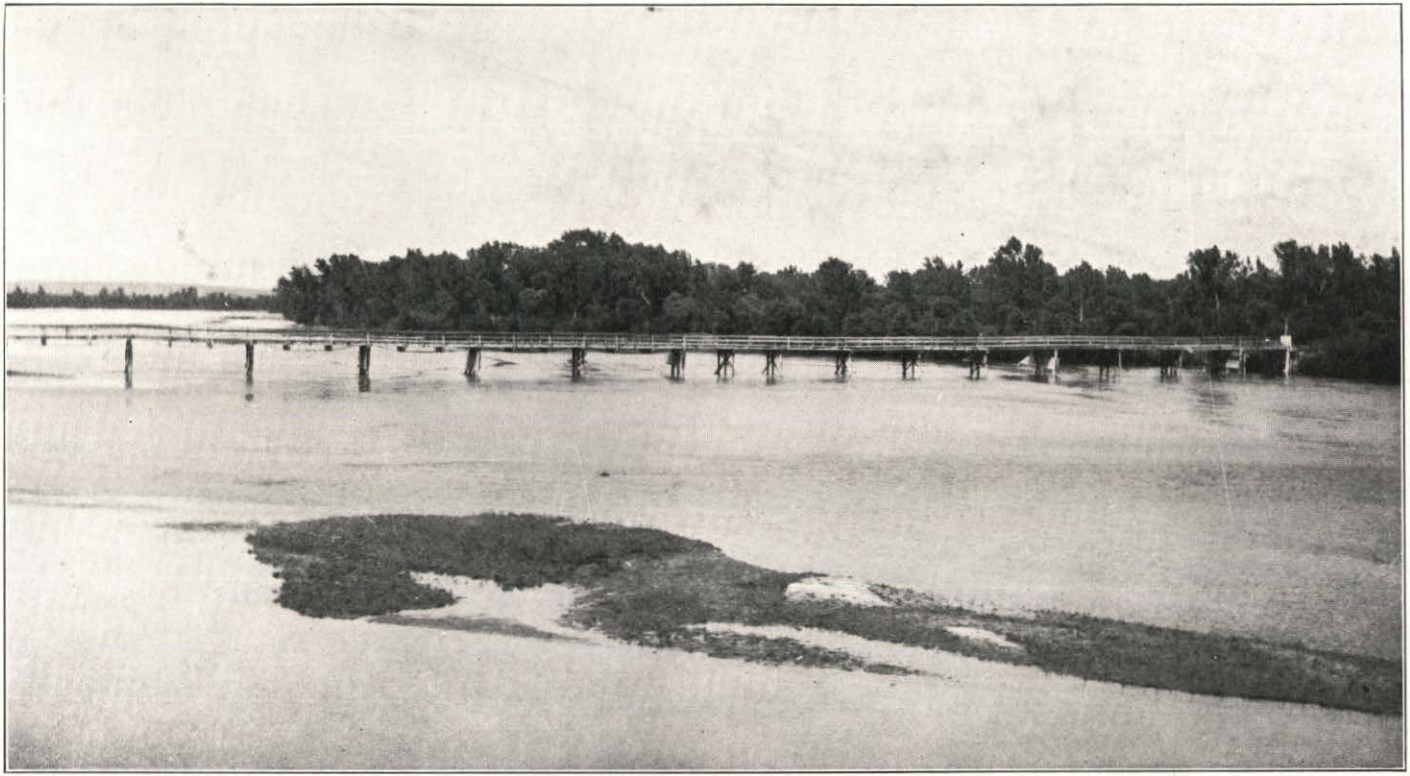
There is a power plant completed and in operation on the Big Blue river at Crete, which is not on record in this office, but it is one of the examples where the original water right was obtained for flour mills and later changed to a hydro-electric plant. This is a very nice modern water power plant and is furnishing current to the city of Crete at a very low rate.

Applications No. 1355 and 1356 were allowed on November 30, 1914, for small power developments on the Big Blue river. The date for completion of these developments is September 1, 1916.

There is still pending before the State Board, Applications 1262, 1363, 1336, 1247, and 1261, by different people for small water power developments along the course of this stream similar to the ones above described.

Docket No. 1021, of the Holmesville Mill and Power Company, has a right of five hundred cubic feet of water at Holmesville, Nebraska, where a hydro-electric plant has been installed and in use for several years, furnishing current to Beatrice, Blue Springs and Wymore.

There has been more power actually developed in the last few years on the Big Blue river than on any other stream in the state. The reason for this undoubtedly is the kind of construction possible in developing water power on this stream, the comparatively low cost of development,



OLD LOUP CITY BRIDGE

and the close proximity to a ready market for the power which is developed.

Attention is next directed to the Republican river, which stream, although there are a number of small power plants along the same, can not be considered of much value for power development for the reason that the stream is frequently dry, the head waters of the same being used for irrigation purposes. Any large development along this stream would necessitate the flooding of large areas of land or the use of canals in order to gain head as the banks are low and very similar to those of the Platte and Loup rivers.

The more important develoments along the stream that have been completed and are now in operation are that of David Guthrie and Company, Docket No. 1026, and that of Gearhart and Benson, Docket No. 1029. Under Docket 1026 four hundred second-feet of water from the river are used and a short canal diverts the water from the river just west of Superior, Nebraska, and returns it to the river just south of the town. This original right was to operate a flour mill and later a hydro-electric power plant was installed and now Mr. Guthrie has quite a large scheme under way to develop power and furnish current to a number of towns in that vicinity.

Docket No. 1029 of Gearhart and Benson of Arapahoe has a right to one hundred ninety-six cubic feet of water from the Republican river and operates a large flour mill by diverting the water through a short canal.

On the following pages is a tabulated list of all appropriations on record in this office relating to water power developments, some of which have been granted and others upon which final certificates have been issued and others now pending before the State Board of Irrigation. The tabulated list is very simple and complete within itself and needs no further comment:

LOUP RIVER DRAINAGE

Number	Source	Sec. Ft. Gtd.	Head	Theo. H. P.	Date of Comp.	Remarks
D- 219	South Loup R.....	20	4.5	10	1895	
D- 292	Shell Creek.....	20	15	52	1897	Flour mill in operation
D- 988	South Loup R.....	83	9	85	1890	Grist mill. Pending
D- 999	Mud Creek.....	54	12	74	1889	Flour mill. Pending
D-1024	Middle Loup R.....	200	11	250	1886	Power plant in operation. Pend.
D-1037	Beaver Creek.....	82	13	121	1896	Flour mill, running. Pending
D-1042	Muddy Creek.....	684	12	934	1890	Flour mill, running. Pending
A- 636	Cedar River.....	200	12	273	1902	Fullerton light plant
A- 639	Beaver Creek.....	67	9	69	1902	Albion light plant
A- 709	Loup Rivr.....	2700	110	33800	1912	Extended, May 25, 1915
A-1029	Loup River.....	3200	.....	.....	.....	Same as A-709. Pending
A-1058	Beaver River.....	134	7.5	114	1912	St. Edwards light plant
A-1077	North Loup R.....	1000	12	1360	1912	No work done
A-1185	Middle Loup R.....	124	6	81	1913	Grist mill and light plant
A-1187	Loup River.....	2000	66	15000	1915	No work done for over year
A-1216	Middle Loup R.....	2000	5	100	1913	Power plant in operation
A-1224	Middle Loup R.....	400	11	500	1914	Hydro-electric plant
A-1234	Middle Loup R.....	500	17	966	1914	Hydro-electric plant
A-1255	Loup River.....	1200	40	5455	.....	Hydro-electric plant. Pending
A-1256	Loup River.....	1200	22	3000	.....	Hydro-electric plant. Pending
A-1257	Loup River.....	1200	30	4090	.....	Hydro-electric plant. Pending
A-1274	Cedar River.....	100	8	91	.....	Hydro-electric plant. Pending
A-1320	Cedar River.....	300	11	376	.....	Pending
A-1325	Cedar River.....	200	13	296	.....	Hydro-electric power plant
A-1373	Middle Loup R....	1000	27	3068	.....	Under construction

PLATTE RIVER DRAINAGE AREA

D-645a	Platte River.....	200	45	1022	1891	Good condition
D- 683	South Platte R.....	30	.....	.....	.....	Never built
D- 992	Wood River.....	40	10	46	1873	Flour mill
D- 994	Wood River.....	40	11.5	52	1873	Flour mill, in operation
D- 995	Wood River.....	25	13	38	1881	Flour mill, in operation
D-1023	Platte River.....	140	60	954	1882	Kearney light plant
A- 40	Platte River.....	2500	150	42600	1906	Never built
A- 894	Platte River.....	2000	150	34100	1915	Same as A-40
A-545a	Wood River.....	10	4	5	1901	Pumping plant for garden
A- 855	Pumpkinseed Cr....	25	8	23	1908	Mill
A- 970	Platte River.....	2500	70	19900	1913	Time extended to April 1, 1916
A-1009	Blue Creek.....	63	10	71	1913	Flour and feed mill
A-1050	Winters Creek.....	1000	60	6820	.....	Pending
A-1215	Spotted Tail Cr....	10	10	13	1913	Hydro-electric plant
A-1217	Sheep Creek.....	70	12	96	1913	Never built
A-1232	Platte River.....	500	150	8520	1915	Same as A-894. Pending
A-1251	Birdwood Creek....	88	50	500	.....	Pending (owned by Kountzze Bros
A-1337	Sheep Creek.....	110	16	200	.....	Hydro-electric plant. Pending
A-1343	Platte River.....	1200	20	2727	1915	Hydro-electric plant. Pending
A-1351	Birdwood Creek....	88	40	400	.....	Hydro-electric plant. Pending
A-1379	Platte River.....	2000	17	3862	.....	Hydro-electric plant. Pending

ELKHORN RIVER AND TRIBUTARIES

Number	Source	Sec. Ft. Grd.	Head	Theo. H. P.	Date of Comp.	Remarks
D- 271	Elkhorn River.....	39	7	31	1883	Atkinson light plant. In use
D- 996	North Elkhorn R..	100	13	148	1870	Cereal mill, in operation
D- 998	Union & Taylor....	75	14	119	.....	Pending
A- 464	S. Fork Elkhorn....	33	8	30	1900	Certificate issued. In use
A- 484	Battle Creek.....	11	12	15	1906	Mills, in operation
A- 818	Battle Creek.....	20	13	30	1907	four mill, in operation
A- 971	Elkhorn River.....	500	70	3980	1913	Time extended to April 1, 1916
A-1250	Elkhorn River.....	400	22	1000	1915	Power Plant

NIOBRARA RIVER DRAINAGE AREA

D- 415	Pine Creek.....	32	14	50	1893	Flour mill
D- 442	Niobrara River.....	10	18	20	1893	Flour and feed mill
D-608a	Crooked Creek.....	3	.....	.....	1889	Mill
D- 610	Niobrara River.....	60	5	31	1886	Flour and saw mill
D-612a	Fairfield Creek.....	25	7	20	1893	Feed and saw mill
D- 970	Niobrara River.....	35	11	44	1893	Flour and meal mill
A- 359	Minnechaduza Cr..	35	29	114	1901	Mill in use. Certificate issued
A- 452	Niobrara River.....	150	.....	.....	1901	Pumping and running machinery
A- 474	Niobrara River.....	15	.....	.....	1901	
A -652	Niobrara River.....	1600	50	9090	1907	No work done, some rock at site
A- 685	Big Sandy Creek..	35	15	60	1903	Flour mill
A- 729	Keya Paha River	100	5	57	1905	Roller mills
A- 941	Long Pine Creek..	48	18	99	1912	Light plan in operation
A- 947	Plum Creek.....	150	30	511	1910	Ainsworth light plant, running
A- 961	Niobrara River.....	900	50	5110	1912	Time extended to Jan. 1, 1915 3000 cu. yds. earth moved
A-1019	Niobrara River.....	700	50	3980	1912	Time extended to Jan. 1, 1915
A-1243	Niobrara River.....	900	98	10023	1915	2000 cu. yds. earth moved
A-1279	Minnechaduza Cr..	40	30	150	1914	Valentine light plant
A-1352	Snake Creek.....	180	44	900	.....	Power plant. Pending
A-1391	Long Pine Creek..	400	30	1363	.....	Pending

BIG BLUE RIVER DRAINAGE AREA

D- 963	Beaver Creek.....	40	10	46	1878	Mill and manufacturing
D- 990	Turkey Creek.....	.....	17	35	1870	Flour mill. Pending
D-1021	Big Blue River.....	500	12	782	1882	Light plant at Holmesville
A-1006	Big Blue River.....	200	18	409	1911	Power plant in operation
A-1035	Big Blue River.....	500	20	1137	1915	No work done
A-1095	Big Blue River.....	.....	.....	.....	.....	To raise Holmesville Dam. Pend.
A-1135	Big Blue River.....	41	8	30	1912	Built and running
A-1153	W. Fork Big Blue	100	12	135	1913	Held up by injunction
A-1247	W. Fork Big Blue	100	12	135	.....	Same as A-1153. Pending
A-1261	Big Blue River.....	200	12	272	.....	Pending
A-1262	Big Blue River.....	500	15	838	.....	Pending
A-1265	W. Fork Big Blue	100	13	147	1915	Under construction
A-1336	Big Blue River.....	100	.....	83	.....	Pending
A-1349	Big Blue River.....	40	14	63	.....	Flour mill. Pending
A-1355	Big Blue River.....	175	15	298	1916	
A-1356	Big Blue River.....	200	15	341	1916	
A-1363	Big Blue River.....	200	13	295	.....	Pending

REPUBLICAN RIVER DRAINAGE AREA

Number	Source	Sec. Ft. Gtd.	Head	Theo. H. P.	Date of Comp.	Remarks
D- 92	Medicine Creek.....	68	9	80	1878	Flour mill in operation
D- 178	Frenchman River..	35	12	50	1886	Flour mill in operation
D- 179	Frenchman River..	29	12	40	1887	Champion mills in operation
D- 181	Red Willow Cr.....	.....	.....	.....	.....	Abandoned fifteen years ago
D- 183	Turkey Creek.....	7	18	33	1874	Good running order
D- 185	Cottonwood Creek	.....	30	.....	1888	Flour mill in operation Undershot wheel
D- 364	Medicine Creek.....	66	15	112	1888	Flour mill
D- 997	Sappa Creek.....	37	8	37	1887	Flour mill in operation. Pend.
D-1013	Frenchman River..	30	12	35	1887	Flour and feed mill
D-1029	Republican River	196	8	178	1879	Flour mill at Arapahoe
D-1036	Republican River	400	21	1000	1878	Flour mill in operation
A- 791	Frenchman River..	35	8	31	1902	Mill in operation
A- 708	Frenchman River..	19	12	26	1904	Pumping plant. Abandoned
A- 748	Frenchman River..	12	12	17	1906	Pumping for irigation
A- 858	Medicine Creek.....	12	18	24	1907	Flour mill
A- 907	Stinking Water.....	30	8	27	1911	Electric light plant
A-1021	Frenchman River..	55	18	113	1914	Electric power, in operation
A-1136	Frenchman River..	75	14	120	1912	Flour mill in operation
A-1221	Republican River	300	42	1480	1915	Never built
A-1245	Rock Creek.....	20	30	65	1914	Hydro-electric power
A-1284	Frenchman River..	50	8	50	1914	Pumping plant for irrigation
A-1339	Frenchman River..	65	20	270	1914	Same as A-1021, for 55 more ft. Already built

WHITE RIVER DRAINAGE AREA

D- 501	White River.....	58	.....	.....	.....	Never used for power
A- 702	White River.....	18	10	21	1904	Abandoned
A- 759	White River.....	5	10	6	1905	Pump for irrigation
A- 854	White River.....	15	15	26	1908	Abandoned

MISCELLANEOUS

D-1002	Bazile Creek.....	10	8	10	.....	Creighton Mill. Pending
A- 839	Tekamah Creek.....	10	20	23	1907	Flour mill
A- 914	Bazile Creek.....	30	12	41	1909	Flour mill at Creighton

The following is a summary of the tabulated list of water power filings in this state:

Drainage Area	Doc. Gtd.	Doc. Pdg.	Tot. Doc.	App. Gtd.	App. Pdg.	Tot. App.	Cer. Iss.	Tot. Doc. and App.	H. P. Pending	H. P. Allowed	Total Horse Power
Loup River.....	2	5	7	12	6	18	.....	25	.14475	55678	70153
Platte River.....	6	.....	6	9	6	15	.....	21	20302	101645	121947
Elkhorn River....	2	1	3	5	.....	5	1	8	119	5233	5352
Niobrara River..	6	.....	6	12	2	14	1	20	2263	29357	31620
Big Blue River..	2	1	3	7	7	14	.....	17	1721	3325	5046
Republican Riv.	10	1	11	11	.....	11	.....	22	34	3750	3784
White River.....	1	.....	1	3	.....	3	.....	4	.....	52	52
Miscellaneous	.....	1	1	2	.....	2	.....	3	9	64	73
Totals to date....	29	9	38	61	21	82	2	120	38923	199104	238027

Abbreviations used:
Doc.—Docket
Gtd.—Granted
Pdg.—Pending
App.—Application
Tot.—Total
Cer.—Certificate
Iss.—Issued
H. P.—Horse Power

From the foregoing tables some idea may be obtained of the possibilities of water power developments in Nebraska. However, of necessity, in making a report of this kind it has been necessary to condense the information and only give a generalization of the conditions as they exist. Exact and detailed information concerning each different project is obtainable and will be freely given by consulting the State Engineer's office.

In order that the water sources of Nebraska may be utilized to the fullest extend without the state suffering from wildcat promotion schemes which have wrecked promising irrigation and water power propositions in other states, it is necessary to have an accurate knowledge of the amount of water flowing in the different streams, and also the exact amount of head or fall that can be developed at the different proposed sites. The very fact that Nebraska has not progressed in the development of water power is a measure due to the fact that no reliable official data has been prepared on this subject. If all of this data could be compiled in some official form, then capital might be induced to undertake development work.

For a number of years the State Engineer's office has been cooperating with the United States Geological Survey, with the result that records of the flow are available at some forty points on the various streams in the state. These records have been compiled in very complete form and published in a report known at the "Hydrographic Report of the State of Nebraska," as an appendix to this Biennial Report."

To measure the daily discharge of a stream a gage is placed in the river and a local observer is secured to record the daily height of the water on the gage. At frequent intervals a hydrographer makes an

actual measurement of the flow of the stream by means of an electric current meter, a delicate instrument, consisting of six cups which are revolved by the current striking them. The hydrographer who usually makes measurements from a bridge in times of high water and wades the streams in times of low water, counts the number of revolutions of the cup by means of an electric attachment and so determines the velocity at different points in the stream. A large torpedo shaped weight is used to sound the stream for depths, and widths across the stream are usually measured across the bridge, and from a knowledge of the velocities, depths and widths the entire flow of the stream is computed. By securing discharge measurments at different stages of the river and combining them with the daily gage heights furnished by the local observer, it is possible to estimate the daily discharge of the stream and thus determine the maximum, minimum and mean flow.

As the flow of the rivers varies considerably from year to year it has been necessary to maintain the records at any one gaging station for a series of years to give completely the information necesssary to insure the successful utilization of one of the state's most valued resources.

As stated above this work has been carried on for a number of years and very complete records are now obtainable upon the different streams over the state. However, this work should be continued as the longer the period of a series of measurements, the more valuable they become. During the present winter actual discharge measurements are being carried on by measuring the flow under the ice at the Loup river station. This will be the first time that anything like this has been attempted, to get an accurate check on the winter flow within the state.

The one thing that our state is short on in order to show exactly what our water power resources are is an actual survey of the streams of the state, which would show possible locations for water power plants and give the head or fall that could be obtained at the different sites. It seems proper at this time to suggest for the serious consideraion of the Legislatiure the advisability of making financial provision for stream surveys by this department which would show the possibility of power developments in this state, such as those which have been made by other states, as Minnesota, Oregon, Washington, Colorado and California. These stream surveys could be made at a cost of not to exceed $15.00 per mile. The United States Geological Survey has always shown a willingness to co-operate both financially and in the field work in making these surveys and I would recommend that an appropriation be made for carrying on this work and that the United States Geological Survey be consulted and asked to co-operate in the making of these surveys.

A great deal has been said of late concerning state ownership and development of the water power resources of Nebraska. It is somewhat questionable whether or not at this time the state as a whole is ready and willing to enter upon development work of this character, and the most feasible solution of this situation which presents itself at this time is the forming of water power districts, much the same as irrigation dis-

tricts are formed at the present time, which would permit cities, counties or different communities to engage in the development of water power and the public ownership and development of the same. A law permitting this kind of development should be considered by the coming Legislature.

As the laws exist at present pertaining to water power the State Board of Irrigation, Highways and Drainage has control of the granting of water power rights on the different streams of the state and supervision of the construction and maintenance of such developments. Also the State Railway Commission has the power to regulate the rates for such companies. It would seem proper and it is recommended that either the State Railway Commission be given complete charge of all such matters of this character, or else the State Board of Irrigation, Highways and Drainage be given complete charge of such matters. This same recommendation would also apply to irrigation as well as water power, as the two departments somewhat conflict, and it necessitates a duplication of engineering work which if combined wholly under either department could be avoided.

Under the persent law it is required that actual work of excavation and construction of a water power project be begun within six months from the date of approval of the application and further, that this construction work be carried on continuously without interruption and that at least one-tenth of the total work as estimated for the full development of the proposed project be completed within one year from the date of allowance of the application. The penalty for the failure to comply with this section is the forfeiture of all rights which have been granted. Notwithstanding this it has been hard and practically impossible on the larger projects to enforce these provisions. It is therefore recommended that in order to more fully and completely eliminate promotion and speculation in water power development in our state, that any person or company proposing to make a development of water power be required upon the approval of his application to deposit with the State Treasurer a cash sum equal in amount to one-tenth of the total cost of the entire project which will give assurance to the State Board that said parties have the money to put the project through and are serious and mean business. This fund deposited with the State Treasurer might be certified out at the request of the developing parties by the State Engineer's office as estimates on the work as it actually progresses, thus insuring the actual amount of work done as required by law. If the developing parties fail to complete the required one-tenth of the development work the first year then said fund deposited with the State Treasurer shall be forfeited without recourse together with the forfeiture of the original grant to the state.

With the above changes as recommended made, and the careful administration and strict adherence to the present law, matters pertaining to the handling of water power should be satisfactorily taken care of, developed and conserved, both from the standpoint of the people of the state and from the standpoint of the investor.

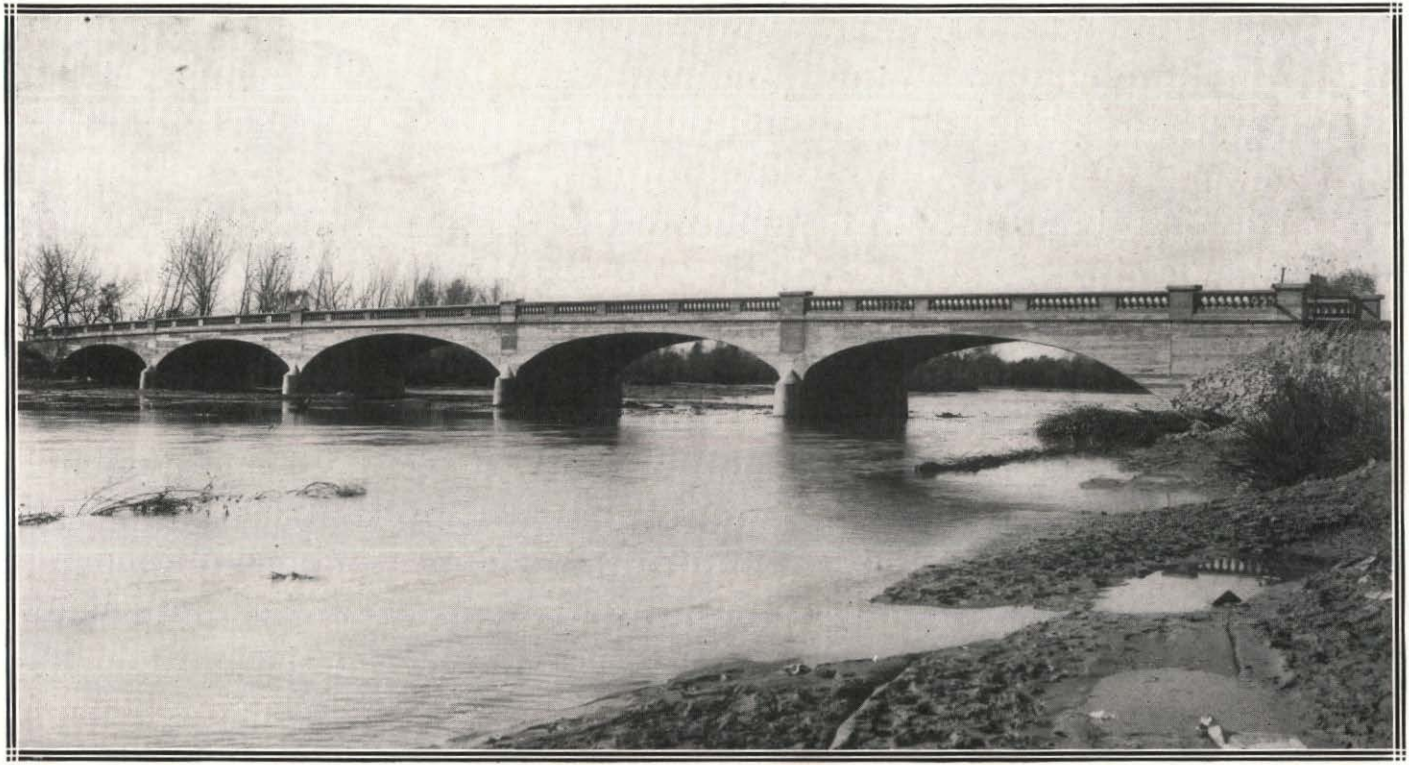
BRIDGES

HIGHWAY AND BRIDGES

Highways: Roadwork over the state has wonderfully improved during the past two years by reason of the County Boards of the different counties taking a greater interest in the roads, and working in conjunction with commercial clubs and good road associations, the results have been rather wonderful. It is very evident to one who has traveled over the state that the people are getting more for the money expended during the last few years than they ever did before. It is also evident that the people themselves are taking greater personal interest in the roads that lie along their places than they have heretofore and make it a special point to help and assist in keeping their part of the road in good shape.

We now have two main transcontinental roads, besides the Meridian Road, which follows closely the Sixth Principal Meridian and runs from Winnipeg to the Gulf of Mexico. The two transcontinental roads are the Lincoln Highway and the Omaha, Lincoln and Denver Highway, which in conjunction with roads through other states make up two separate highways. These are the three main roads in our state and should be of interest to everyone, as automobile travel is becoming more popular and increasing very rapidly. During the year 1915, it is expected that there will be a very great amount of travel on both of our transcontinental roads by reason of people driving through our state by automobile going to the Panama Exposition and there is perhaps no better way of seeing the country through which one is traveling than by automobile. It is a good advertisement and money well spent either in a community or in a state at large to have roads, as anyone traveling on them will be sure to remember and remark the good and bad roads over which they travel.

The Lincoln Highway in Nebrasska passes through Omaha, Fremont, Grand Island, Kearney, North Platte, Ogalalla and Sidney. This road is in fairly good shape through the state excepting at the western portion, where there is room for a large improvement. In the western part of our state on this highway the road in places has never been graded, but merely follows old trails which have become deeply rutted and are full of chuck holes. An extra effort should be made to place this road in better condition during the coming year. There are on this highway many stretches of excellent road, one stretch in particular which is worthy of mention is a piece of road lying a few miles east of Sutherland, Nebraska, which runs through some sand hills. This piece of road used to be very sandy and in hot, dry weather, nearly impassable for automobiles. The County Commissioners of Lincoln county hauled clay



CAMBRIDGE STATE AID BRIDGE, REPUBLICAN RIVER

on this stretch in the sand hills and mixed the clay with gravel in such proportion to form a hard, smooth road, which now gives the appearance of macadam, showing that what used to be a very bad stretch of road is now in first class shape. This is a practical example of what may be accomplished on all roads in the state at a very small cost when properly managed and supervised.

The Omaha, Lincoln and Denver Highway passes through Omaha, Lincoln, Hastings, McCook, Fort Morgan, Colorado, and on to Denver, This road is in very good shape and traverses for the greater part of the highway high table land which is nearly level. With the exception of a stretch of road between Atlanta and Oxford, which is very rough and hilly, most of which have not been cut down, the road is in excellent shape.

Outside of these main highways every county has its own special good roads and every county board in the state is taking pride in the fact that they are extending these good roads every year in their counties, and in order to do justice to each county board it would be necessary to enumerate what each one had done during the past two years. I do not believe that Nebraska is ready at this time for paved roads or even macadam for the reason that any one of these costs a great deal to build. Nebraska also has very good materials throughout nearly all portions of the state with which to build good earth roads.

An earth road should be properly graded wide enough so that two vehicles can pass easily; that the grade should not be crowded too much but should be left rather flat so that the travel can be over any portion of the road; and that after the grading has been done and the grade has been fixed, that it should be surfaced with clay and gravel, either one of which is nearly always readily obtainable in the vicinity. Then if the road is kept properly dragged, it will remain in a more or less permanent state and this work can be done at a very low cost.

There should be some centralization of authority pertaining to highways in our state, and this central body representing the state should have the power to create state roads, which should be main roads across the state, together with roads connecting the more important towns of each county, and the different county seats. All other roads should be known as county roads. Then there should be a tax, according to the horse power, provided for each motor vehicle in the state, which tax should be paid directly to the central authority and a registered number and tag issued for that year to the owner of any motor vehicle. It might be possible to release the owner of any motor vehicle from any other tax on said vehicle than the one paid into this central authority. The money thus obtained should go into a state road fund and be expended by and under the supervision of the central authority on road work only. This would give a considerable sum of money as a state appropriation to start the work.

Our laws should be so changed that the prisoners of our state penitentiary could be worked by and under the direct supervision of the central authority and such other assistance either financially or other-

wise be given on state roads only. All grading and work of any kind on roads known as state roads should be done under the direct supervision of the central authority and in this way they would all be uniform throughout our state and would set a good example for the county boards to follow in taking care of the county roads. If this system was maintained and followed out for a few years, it is thought that without any other direct state appropriation our main roads throughout the whole state would be greatly improved and it would not be long before the branch or county roads would be improved in a similar manner. Naturally the work will have to go slowly and it will take time to make all the changes and improvements that are desired, but by following a definite and uniform plan and system under a central head or authority we would be gradually working toward a common end.

Bridges—County Bridge Work: The legislature of 1913 worked a great change in the bridge laws of the state of Nebraska. Up to that time there had been no standard plans and specifications for building of highway bridges in this state. A few of the counties had their county engineers or surveyors prepare plans upon which to let contracts to build bridges, but in a large majority of the counties the bridge companies furnished plans and specifications for bridges and the company whose plans and specifications were finally adopted by the county were given an unjust advantage over other competitors for the reason that these plans which were put on file were not fully detailed and did not specify clearly and positively the sizes and kinds of materail and the method of construction. It was also impossible to get any comparison of what bridge work was costing in the different counties in the state because of the large variance in the types and kinds of bridge construction which was being carried on throughout the different counties.

Realizing this the Legislature of 1913 passed a law making it the duty of the State Engineer's office to prepare a standard set of plans and specifications for the use of the different counties of the state and made it compulsory that the counties use these plans in receiving bids for the construction of bridges and in the building of the same. The Legislature also went further and made it the duty of the State Engineer's office, that when called upon to do so, either by the county board of commissioners or supervisors when petitioned by five or more free holders of a county, to inspect and report on any bridge work done in any county in the state. In compliance with the above requirements this office, after a careful investigation and study adopted a standard set of specifications covering loads, designs, construction and erection of highway bridges and also have designed a complete standard set amounting in all to about 250 highway bridge plans as follows:

Wood superstructures, for lengths from twelve to thirty-two feet, by two foot intervals, for fourteen, sixteen and eighteen foot roadways.

Steel pile foundations, and tubular pier foundations.

"I" Beam superstructures, for lengths from twelve feet to thirty-two feet by two foot intervals, for fourteen, sixteen and eighteen foot roadways.

Steel Girder superstructures for lengths from thirty to forty feet, by two foot intervals, for fourteen and sixteen foot roadways.

Riveted Superstructure, with 16'0" Roadway				Pin Connected Superstructures, with 16' 0" Roadway			
Panels	Type	For Wood Floor	For Concrete Floor	Panels	Type	For Wood	For Concrete Floor
3	Low Truss	35 feet	35 feet	3	Low Truss	35 feet	35 feet
3	Low Truss	40 feet	40 feet	3	Low Truss	40 feet	40 feet
3	Low Truss	45 feet	45 feet	3	Low Truss	45 feet	45 feet
3	Low Truss	50 feet	50 feet	3	Low Truss	50 feet	50 feet
4	Low Truss	50 feet	50 feet	4	Low Truss	50 feet	50 feet
3	Low Truss	55 feet	55 feet	3	Low Truss	55 feet	55 feet
4	Low Truss	55 feet	55 feet	4	Low Truss	55 feet	55 feet
3	Low Truss	60 feet	60 feet	3	Low Truss	60 feet	60 feet
4	Low Truss	60 feet	60 feet	4	Low Truss	60 feet	60 feet
4	Low Truss	65 feet	65 feet	4	Low Truss	65 feet	65 feet
4	Low Truss	70 feet	70 feet	4	Low Truss	70 feet	70 feet
5	Low Truss	70 feet	70 feet	5	Low Truss	70 feet	70 feet
4	Low Truss	75 feet	75 feet	4	Low Truss	75 feet	75 feet
5	Low Truss	75 feet	75 feet	5	Low Truss	75 feet	75 feet
4	Low Truss	80 feet	80 feet	4	Low Truss	80 feet	80 feet
5	Low Truss	80 feet	80 feet	5	Low Truss	80 feet	80 feet
5	Low Truss	85 feet	85 feet	5	Low Truss	85 feet	85 feet
5	Low Truss	90 feet	90 feet	5	Low Truss	90 feet	90 feet
6	High Truss	90 feet	90 feet	6	High Truss	90 feet	90 feet
5	Low Truss	95 feet	95 feet	5	Low Truss	95 feet	95 feet
5	Low Truss	100 feet	100 feet	5	Low Truss	100 feet	100 feet
6	High Truss		100 feet	6	High Truss	100 feet	100 feet
6	High Truss	110 feet	110 feet	6	High Truss	110 feet	110 feet
7	High Truss	120 feet	120 feet	7	High Truss	120 feet	120 feet
7	High Truss	130 feet	130 feet	7	High Truss	130 feet	130 feet
7	High Truss	135 feet		8	High Truss	140 feet	140 feet
8	High Truss	140 feet	140 feet	8	High Truss		145 feet
8	High Truss	150 feet	150 feet	8	High Truss	150 feet	150 feet
8	High Truss	160 feet	160 feet	9	High Truss	160 feet	160 feet
				9	High Truss	170 feet	170 feet
				9	High Truss	180 feet	180 feet
				10	High Truss	190 feet	190 feet
				10	High Truss	200 feet	200 feet
				12	High Truss	240 feet	
				16	High Truss	304 feet	

Also this office has prepared a standard set of bidding blanks, bonds and contract, which are to be used in all of the counties throughout the state and which have proved to be very satisfactory. A copy of these bidding blanks is submitted herewith together with the form of contract and bond.

PROPOSAL FOR BRIDGES, BRIDGE MATERIALS AND BRIDGE WORK

To the Honorable Board of.....of.....County

State of Nebraska.

Gentlemen:

The undersigned,.....
of....., having carefully studied the plans, specifications and instructions to bidders, and the form of Contract and Bond attached to and made a part of said plans and specifications, copies of which are on file in the office of the County Clerk, all of which..... fully understand and hereby agree to propose to furnish all material and labor, necessary to erect and complete such bridges, bridge material and bridge work as you may require during the year beginning..... .....for the unit prices as set forth in price sheets hereto attached and made a part of this proposal.

Very respectfully submitted,

Date..... .....

.....

.....

.....

PRICES PER LINEAL FOOT FOR PIN CONNECTED SUPERSTRUCTURES WITH 16' ROADWAY, COMPLETE IN PLACE EXCEPT FLOOR

Panels	Length	Type	For Wood Floor	For Concrete Floor
3	35 feet	Low Truss		
3	40 feet	Low Truss		
3	45 feet	Low Truss		
3	50 feet	Low Truss		
4	50 feet	Low Truss		
3	55 feet	Low Truss		
4	55 feet	Law Truss		
3	60 feet	Low Truss		
4	60 feet	Low Truss		
4	65 feet	Low Truss		
4	70 feet	Low Truss		
5	70 feet	Low Truss		
4	75 feet	Low Truss		
5	75 feet	Low Truss		
4	80 feet	Low Truss		
5	80 feet	Low Truss		
5	85 feet	Low Truss		
5	90 feet	Low Truss		
6	90 feet	High Truss		
5	95 feet	Low Truss		
6	95 feet	High Truss		
5	100 feet	Low Truss		
6	100 feet	High Truss		
6	105 feet	High Truss		
7	105 feet	High Truss		
6	110 feet	High Truss		
7	110 feet	High Truss		
6	115 feet	High Truss		
7	115 feet	High Truss		
6	120 feet	High Truss		
7	120 feet	High Truss		
8	120 feet	High Truss		
7	125 feet	High Truss		
8	125 feet	High Truss		
7	130 feet	High Truss		
8	130 feet	High Truss		
7	135 feet	High Truss		
8	135 feet	High Truss		
7	140 feet	High Truss		
8	140 feet	High Truss		
8	145 feet	High Truss		
9	145 feet	High Truss		
8	150 feet	High Truss		
9	150 feet	High Truss		
8	155 feet	High Truss		
9	155 feet	High Truss		
8	160 feet	High Truss		
9	160 feet	High Truss		
9	165 feet	High Truss		
10	165 feet	High Truss		
9	170 feet	High Truss		
10	170 feet	High Truss		
9	175 feet	High Truss		
10	175 feet	High Truss		
9	180 feet	High Truss		
10	180 feet	High Truss		
10	185 feet	High Truss		
10	190 feet	High Truss		
10	195 feet	High Truss		
10	200 feet	High Truss		

PRICES PER LINEAL FOOT FOR RIVETED SUPERSTRUCTURES WITH 16' 0" ROADWAYS COMPLETE IN PLACE EXCEPT FLOOR

Panels	Length	Type	Wood Floor For	Concrete Floor For
3	35 feet	Low Truss		
3	40 feet	Low Truss		
3	45 feet	Low Truss		
3	50 feet	Low Truss		
4	50 feet	Low Truss		
3	55 feet	Low Truss		
4	55 feet	Low Truss		
3	60 feet	Low Truss		
4	60 feet	Low Truss		
4	65 feet	Low Truss		
4	70 feet	Low Truss		
5	70 feet	Low Truss		
4	75 feet	Low Truss		
5	75 feet	Low Truss		
4	80 feet	Low Truss		
5	80 feet	Low Truss		
5	85 feet	Low Truss		
5	90 feet	Low Truss		
6	90 feet	High Truss		
5	95 feet	Low Truss		
6	95 feet	High Truss		
5	100 feet	Low Truss		
6	100 feet	High Truss		
6	105 feet	High Truss		
7	105 feet	High Truss		
6	110 feet	High Truss		
7	110 feet	High Truss		
6	115 feet	High Truss		
7	115 feet	High Truss		
6	120 feet	High Truss		
7	120 feet	High Truss		
8	120 feet	High Truss		
7	125 feet	High Truss		
8	125 feet	High Truss		
7	130 feet	High Truss		
8	130 feet	High Truss		
7	135 feet	High Truss		
8	135 feet	High Truss		
7	140 feet	High Truss		
8	140 feet	High Truss		
8	145 feet	High Truss		
9	145 feet	High Truss		
8	150 feet	High Truss		
9	150 feet	High Truss		
8	155 feet	High Truss		
9	155 feet	High Truss		
8	160 feet	High Truss		
9	160 feet	High Truss		

PRICES PER LINEAL FOOT FOR I BEAM SUPERSTRUCTURES COMPLETE IN PLACE EXCEPT FLOOR

		14 Ft. Roadway		16 Ft. Roadway		18 Ft. Roadway	
Panels	Length	Wood Floor	Conc'te Floor	Wood Floor	Conc'te Floor	Wood Floor	Conc'te Floor
1	12 ft.						
1	14 ft.						
1	16 ft.						
1	18 ft.						
1	20 ft.						
1	22 ft.						
1	26 ft.						
1	24 ft.						
1	28 ft.						
1	30 ft.						
1	32 ft.						

PRICES PER LINEAL FOOT FOR STEEL GIRDER SUPERSTRUCTURES COMPLETE IN PLACE EXCEPT FLOOR

		14 Ft. Roadway		16 Ft. Roadway		18 Ft. Roadway	
Panels	Length	Wood Floor	Conc'te Floor	Wood Floor	Conc'te Floor	Wood Floor	Conc'te Floor
3	30 ft.						
3	32 ft.						
3	34 ft.						
3	36 ft.						
3	38 ft.						
3	40 ft.						

PRICES FOR LINEAL FOOT FOR WOOD SUPERSTRUCTURES COMPLETE IN PLACE INCLUDING FLOOR

Panels	Length	Width of Roadway		
		14 Ft.	16 Ft.	18 Ft.
1	12 ft.			
1	14 ft.			
1	16 ft.			
1	18 ft.			
1	20 ft.			
1	22 ft.			
1	24 ft.			
1	26 ft.			
1	28 ft.			
1	30 ft.			
1	32 ft.			

PRICES FOR CONCRETE BOX CULVERTS, SLAB BRIDGES, GIRDER BRIDGES, ARCH BRIDGES, WINGS, BACKING, PIERS, ABUTMENTS, CONCRETE FLOORS OR CONCRETE IN ANY CONDITION FOR THE VARIOUS UNITS AS GIVEN BELOW AND AS SPECIFIED AND DEFINED IN SPECIFICATIONS

Wakefield sheet piling for cofferdams, in place, per M. feet B. M.	.....	.....
Wakefield sheet piling for permanent use, in place, per M. feet B. M.	.....	.....
Round piling 9 in. tops, driven in place, per lineal foot	.....	.....
Reinforcing, any condition, in place, per pound	.....	.....
Mass Concrete in place per cubic foot	.....	.....
Architectural Concrete in place per cubic foot	.....	.....
Dry Excavation per cubic foot	.....	.....
Wet Excavation per cubic foot	.....	.....
Rock Excavation per cubic foot	.....	.....
Forms—For architectural concrete, in place, per M. feet B. M.	.....	.....
Forms—For Mass concrete, in place, per M. feet B. M.	.....	.....

PRICES FOR STEEL SUBSTRUCTURES, WOOD OR WOOD BLOCK FLOORS AND MISCELLANEOUS ITEMS AND REPAIRS. UNITS AS GIVEN BELOW AND ALL AS DEFINED AND SPECIFIED IN THE SPECIFICATIONS

STEEL TUBE SHELLS IN PLACE

Type	Dia.	Per Vertical Foot of Each Shell in Place	Price 1-4 in. Metal	5-16 in Metal	38 in. Metal	1-2 in. Metal
A	36 in	.....	.....	.....	.....	.....
B	42 in	.....	.....	.....	.....	.....
C	48 in	.....	.....	.....	.....	.....
D	54 in	.....	.....	.....	.....	.....
E	60 in	.....	.....	.....	.....	.....

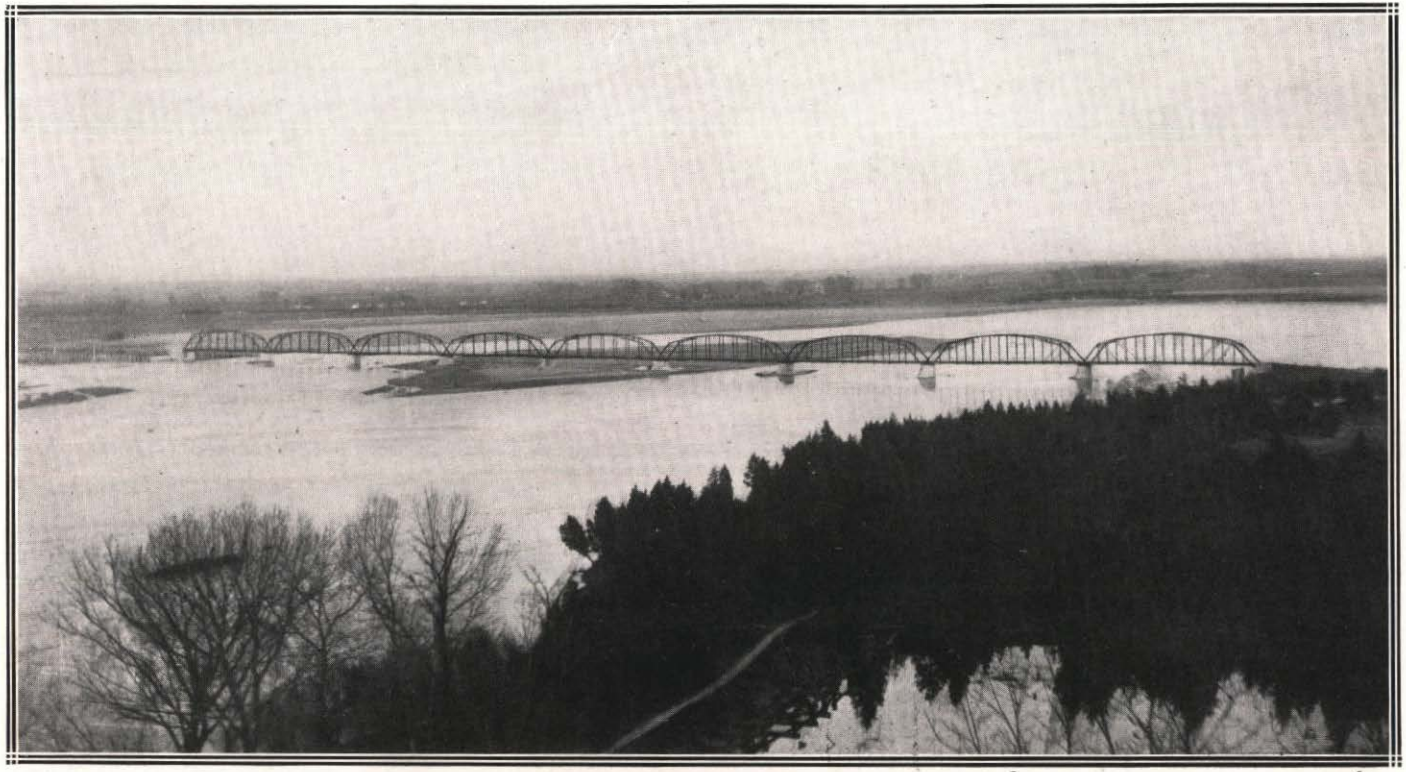
STEEL PILING

Type	Size		
A	8 in. I at 18#.....	Per foot of	.....
B	Built "H"8 in .(channels-33 3-4#)	each pile in	.....
C	Bethlehem "H" 8 in. 35#.....	place	.....
D	Bethlehem Girder 8 in.-32.5#.....	.....	.....

STEEL CAPS

Type	Size		
A	2-6 in. channels	Per foot of each cap	.....
B	2-7 in. channels	in place	.....
C	2-8 in. channels	.....	.....
D	2-10 in. channels	.....	.....
E	2-12 in. channels	.....	.....

For any Fabricated Steel not otherwise bid on per pound in place.



GENERAL VIEW OF FREMONT STATE AID BRIDGE. PLATTE RIVER

WOOD PILING DRIVEN IN PLACE
Except in connection with concrete work

Kind of Piling	Per Lineal Ft. in Place for Purpose Stated	For New Work	For Repair W'k
Red Cedar under 24 feet long....			
Red Cedar 24 feet long and over			
White Oak under 24 feet long....			
White Oak 24 feet long and over			
Fir Piling untreated, any length			
Fir Piling creosoted, any length			

LUMBER

Except in connection with concrete work

	For New Work	For Repair W'k
For creosoted block floor, in place, per square yard.....		
Fir lumber untreated, in place, per M. feet B. M.....		
Fir lumber, creosoted, in place, per M. feet .B M.....		
Pine lumber, untreated, in place, per M. feet B. M.....		
Pine lumber, creosoted, in place, per M. feet B. M.....		
White Oak lumber, untreated, in place, per M. feet B. M		
For handling old lumber—tearing out—per M. feet B. M.		
For replacing old lumber, per M. feet B. M.....		
For any overhaul per ton per mile.....		
For any other work, materials or labor, cost plus a profit of———per cent.....		

CONTRACT

This Contract, made in duplicate and entered into this.....day of .....19.... by and between the Board of..... for the County of.....State of Nebraska party of the first part and.....of.....County, State of..... party of the second part.

WITNESSETH: That for and in consideration of the unit prices for bridges, bridge work and bridge materials, as set forth in the attached proposals and sheets attached thereto, and which unit prices the party of the first part hereby agrees to pay the party of the second part, the party of the second part agrees to construct, furnish and complete in a good and workmanlike manner and in full and exact compliance with the plans and specifications including general printed stipulations and specifications which are hereto attached and hereby made a part of this contract, and to the full satisfaction of the party of the first

part, such bridges, bridge work and bridge materials as the party of the first part maay require during the year beginning.....1913.

It is further agreed between the parties hereto that from time to time estimates be paid to the party of the second part by the party of the first part upon materials furnished and labor performed, as in the judgment of the party of the first part may be right and proper.

It is further agreed between the parties hereto that such bridges, bridge work and bridge materials ordered by the party of the first part shall be furnished and completed by the party of the second part within .....days from the date of such order.

Provided further, that due notice shall be given to the party of the first part by the party of the second part when about to commence the building of any bridges in order that the party of the first part may provide for the inspection of materials and labor to be performed, and unless otherwise specifically provided,.....of the District in which the work is to be performed is hereby designated by the party of the first part to act for and in behalf of the party of the first part at all times when such Board of.....is not in official session.

It is further agreed between the parties hereto that the said party of the second part shall protect and hold the party of the first part free and harmless from any and all claims for royalties on account of the infringement of any patents.

The party of the second part hereby agrees to furnish within thirty days from the date hereof, a good and sufficient surety bond acceptable to the party of the first part in the sum of.....Dollars, conditioned for the faithful performance and full completion of the agreement of the party of the second part under and in accordance with the terms of this contract.

This contract shall be binding upon the heirs, executors, administrators, successors and assigns of the respective parties hereto.

IN WITNESS WHEREOF the parties hereto have set their hands the day and year first above written.

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

.....

Party of the First Part

.....

.....

Party of the Second Part

ATTEST:

I hereby certify that the foregoing contract has this day been duly signed by the Board of County .....of.....County, Nebraska, and by the contractor, and is now hereby countersigned by me, as County Clerk, ex-officio clerk of said County Board.

(SEAL) .....191..... .....

BOND OF PUBLIC CONTRACTOR

KNOW ALL MEN BY THESE PRESENTS: That we..... .....as principal, and ..... as sureties, are held and firmly bound unto the County of..... State of Nebraska, in the penal sum of $....., and for the payment of which we do hereby bind ourselves, our heirs, executors, and administrators, jointly, severally, and firmly by these presents.

Dated.....A. D. 19.....

The condition of this obligation is such that whereas the above bounden.....has been awarded by the County Board of..... of..... County, of the State of Nebraska, the contract for..... according to certain plans, specifications, proposals and contract on file in the office of the County Clerk of said County,

Now if the said ..... shall faithfully keep and perform each and every one of the stipulations and agreements contained in the said contract, plans, specifiications and proposals at the time and in the manner therein specified, and pay off and settle in full with the person or persons entitled thereto all accounts and claims that may be become due by reason of laborers' or mechanics' wages, or for materials furnished, or services rendered to said party of the first part in executing or performing the obligations of said contract, so that each of such persons may receive his just dues in that behalf, then this obligation to be void; otherwise to be and remain in full force and effect in law.

In Presence of

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

By experience during the past two years with these bidding blanks it has been found that certain changes regarding concrete, forms and excavation should be made in the same, and it is proposed to make these changes during the coming year.

The office has also prepared a standard set of concrete bridge plans, starting with small culverts and running up to fifty foot concrete arch spans. These include small arch culverts, box culverts, slab bridges from eight to twenty foot spans by two foot intervals; girder bridges from twenty to forty foot spans, by five foot intervals; and arch bridges from ten to fifty foot spans by five foot intervals. The concrete arches also have several different rises given for the same length of span. This is the first attempt at standardizing concrete plans, especially of the arch type that has been made. The bidding blanks should be changed so as to bid upon concrete bridges, especially superstructures, by the lineal foot the same as steel bridges. In this way the county boards can easily estimate the cost of a concrete bridge the same as they now

estimate the cost of a steel bridge. This should also tend to increase the use of concrete.

The idea has always prevailed for some reason that to build a concrete bridge took a large amount of money, greatly in excess of a steel bridge. This is misleading and is not the fact. Under the twenty ton loading law as it now exists, the difference between a permanent steel bridge and a permanent concrete bridge is not so very great, and the use of concrete is becoming more popular. However, one point must always be born in mind, and that is that a poor concrete job is worse than a poor steel job, and care should be taken in doing concrete bridge work to secure the best materials and properly experienced labor for the construction of the same.

There has been considerable criticism of the twenty ton carrying capacity law in our state and also that the steel bridges built upon state plans cost a great deal in excess of steel bridges formerly built by the counties. It will be remembered that a concentrated moving load of twenty tons, which in our bridges we have assumed as a twenty ton traction engine, only affects the truss members in steel bridge spans under sixty feet in length and in steel spans over sixty feet in length the determining factor in the design of truss members is the uniform live load per square foot of floor surface. The twenty ton traction engine loading therefore only affects the floor systems, which are composed of the floor beams and stringers, in spans over sixty feet in length. In spans under sixty feet in length, a twenty ton traction engine loading will, of course, affect both the truss and floor system. One reason why the steel bridges built under the state plans have cost more is because of the different class of work required which, under the state specifications, requires a better class and grade of shop work and a better grade of erection work in the field and the riveting of all field connections instead of bolting them as has been the practice heretofore.

Another reason for the added cost is the fact that many counties in our state did not use a complete set of steel stringers in the floor system but used a majority of wooden stringers. On all state plans steel stringers are specified and required. This makes an additional first cost in a bridge, but also makes the bridge more permanent and a better structure and enables the laying of the concrete floor thereon either at the time of building the bridge or later on when the county is in a better financial condition to so do.

During the year of 1914 there were thirty-six counties in the state who received bids on state plans for yearly contracts. These bids have been tabulated and blue prints of these have been sent to the county clerks of each county for the inspection and information of the county boards in order that they may know the prices paid for the same class of work in the different counties throughout the state and will give them better idea of what the proper prices for this work should be. This has only been possible through the use of standard and uniform plans, specifications and bidding blanks.

Steel Superstructure Complete in Place Except Fl.

Panels	Lgth	Type	Pin Connected Floor Wood	Pin Connected Floor Conc.	Riveted Wood	Riveted Conc.
3	35'	Low	$21 48	.....	$23 05	.....
3	40'	.....	22 13	.....	23 55	.....
3	45'	.....	22 21	.....	23 85	.....
3	50'	.....	23 28	.....	24 75	.....
4	50'	.....	24 51	.....	25 12	.....
3	55'	.....	23 65	.....	25 17	.....
4	55'	.....	24 53	.....	25 64	.....
3	60'	.....	23 88	.....	25 50	.....
4	60'	.....	24 79	.....	26 18	.....
4	65'	.....	25 33	.....	25 41	.....
4	70'	.....	26 41	.....	27 43	.....
5	70'	.....	26 94	.....	27 53	.....
4	75'	.....	27 04	.....	27 78	.....
5	75'	.....	27 06	.....	27 24	.....
4	80'	.....	27 36	.....	28 37	.....
5	80'	.....	28 22	.....	29 03	.....
5	85'	.....	28 94	.....	29 41	.....
5	90'	.....	28 38	.....	29 75	.....
5	100'	.....	29 86	.....	31 01	.....
6	110'	High	.....	.....	.....	.....
7	120'	.....	.....	.....	.....	.....
8	130'	.....	.....	.....	.....	.....
8	140'	.....	.....	.....	.....	.....

Steel Tube Shells Per Vertical Foot in Place

Type	Diam.	1/4"	5/16"	3/8"	1/2"
A	36"	$ 6 74	$ 8 07	$ 9 04	$10 58
B	42"	7 79	9 26	10 47	12 09
C	48"	8 49	10 76	11 88	13 64
D	54"	10 03	11 66	13 26	15 16
E	60"	11 02	13 07	14 60	15 88

Steel Caps Per Foot of Cap in Place

A	2- 6" Channels	$ 1 02
B	2- 7" Channels	1 26
C	2- 8" Channels	1 51
D	2-10" Channels	1 93
E	2-12" Channels	2 34

Superstructure

Panel	Lgth	I Beam 14' R'd'y Wood	I Beam 14' R'd'y Conc.	I Beam 16' R'dw'y Wood	I Beam 16' R'dw'y Conc.	I Beam 18' R'd'y Wood	I Beam 18' R'd'y Conc.	Steel Girder 14' R'd'y Wood	Steel Girder 14' R'd'y Conc.	Steel Girder 16' R'dw'y Wood	Steel Girder 16' R'dw'y Conc.	Steel Girder 18' R'd'y Wood	Steel Girder 18' R'd'y Conc.	Wood 14'	Wood 16'	Wood 18'
1	12'	.....	.....	$7 78	$8 57	.....	.....	.....	.....	.....	.....	.....	.....	.....	$5 39	.....
1	14'	.....	.....	8 77	9 45	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 47	.....
1	16'	.....	.....	9 05	9 88	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 87	.....
1	18'	.....	.....	9 83	10 12	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 01	.....
1	20'	.....	.....	10 10	10 69	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 47	.....
1	22'	.....	.....	11 26	11 90	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 45	.....
1	24'	.....	.....	11 37	13 46	.....	.....	.....	.....	.....	.....	.....	.....	.....	7 15	.....
1	26'	.....	.....	13 35	14 22	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 98	.....
1	28'	.....	.....	13 73	14 69	.....	.....	.....	.....	.....	.....	.....	.....	.....	7 59	.....
1	30'	.....	.....	14 17	16 52	.....	.....	.....	.....	21 73	22 11	.....	.....	.....	8 17	.....
1	32'	.....	.....	14 52	17 55	.....	.....	.....	.....	21 82	22 35	.....	.....	.....	8 29	.....
1	34'	.....	.....	.....	.....	.....	.....	.....	.....	21 93	23 84	.....	.....	.....	.....	.....
1	36'	.....	.....	.....	.....	.....	.....	.....	.....	22 79	24 47	.....	.....	.....	.....	.....
1	38'	.....	.....	.....	.....	.....	.....	.....	.....	22 17	24 67	.....	.....	.....	.....	.....
1	40'	.....	.....	.....	.....	.....	.....	.....	.....	24 63	36 38	.....	.....	.....	.....	.....

Steel Piling Per Foot in Place

A	8"-18# I	1 30
B	Built 8"-33¾#	2 27
C	Beth. "H"-8" 32#	2 24
D	Beth "H"-8 32#	2 27

Wood Piling Per Foot of Pile in Place

Red Cedar under 24 feet long	$ .42	$ .458
Red Cedar over 24 feet long	.448	.487
White Oak under 24 feet long	.44	.626
White Oak over 24 feet long	.46	.507
Fir Piling untreated	.527	.582
Fir Piling creosoted	.....	.....

Wakefield piling for cofferdams per M. BM. in place	$58 03
Wakefield piling for permanent use per M. BM. in place	69 36
Round piling 9" top driven in place per lineal foot	52
Reinforcing any condition in place per lb.	037
Mass concrete in place per cubic foot	409
Architectural concrete in place per cubic foot	631
Dry excavation per cubic foot	028
Wet excavation per cubic foot	234
Rock excavation per cubic foot	407
Forms for architectural concrete per M. BM. in place	32 44
Forms for mass concrete per M. BM. in place	18 45

Fir lumber untreated per M. BM. in place	.....	.....
Fir lumber creosoted per M. BM. in place	38 72	42 11
Pine lumber untreated per M. BM. in place	60 66	65 12
Pine lumber creosoted per M. BM. in place	41 66	46 22
White Oak untreated per M. BM. in place	62 08	67 09
Tearing out old lumber per M... BM	46 05	50 88
Replacing old lumber per M. BM	5 24	6 27
Fir Floor complete in place per lin. ft. of br	8 92	9 57
Creosoted block floor complete in place per sq. yrd	3 92	4 66
Overhaul per ton per mile	311	.....
Farricated steel not otherwise bid per lb. in pl	055	

All other labor or material, cost plus 11.22 per cent.

The foregoing table has been prepared and shows the average prices paid for the different spans and items as appearing on our uniform plans and bidding sheets and this is submitted herewith as representing the average price paid for bridge work throughout the state for the year 1914.

This office has always been willing to send a man free of cost to the county to go with the county boards and inspect bridges or road work and make recommendations or prepare any special plans that the county board might desire or request. A large number of the counties have availed themselves of this opportunity and in accepting bridge work in their counties always require an inspection to be made by the State Engineer's office before the final payment to the contractor. This gives the counties the benefit of experienced men in passing inspection on the bridges that they build and relieves the county board of a considerable amount of responsibility in accepting the work. A large number of these inspections have been made and reports of the work made direct to the county boards. This in itself has been of great value and assistance to the counties.

State Aid Bridges: Under the state aid bridge law many of the bridges which were under construction have been completed and a number of new contracts have been let. This law has proved most satisfactorily in that it has been possible to build permanent structures across the larger streams in the state and give aid to the counties through which these streams pass, which has seemed to be a burden which should be more or less distributed throughout the state as these bridges are being used both by the local community and by the public at large.

In the building of these bridges it has been possible to set an example to the different counties as to the more permanent class of structures that can be built and that should be built even though the first cost is more than that which has been paid for bridges heretofore. The maintenance cost is not so large and in the end that will more than make up the difference. The following table shows the standing of the different applications for state aid that have been received, the action thereon, the contracts which have been let and the cost of those bridges which have been completed. Also on the pages following said table will be found a special description of each state aid bridge and pictures of the same.

LIST OF APPLICATIONS FOR STATE AID BRIDGES

County	Date Filled	Bridge	Stream	Standing	Total Cost
Boone	5- 4-1911	Reed	Cedar River	Withdrawn	$
Boyd & Holt	5- 4-1911	Butte	Niobrara	Pending	
Garden	5-22-1911		North Platte	Withdrawn	
Morrill	5-21-1911	Bayard	North Platte	Completed	23335 32
Morrill	5-21-1911	Bridgeport	North Platte	Completed	25743 63
Washington	6-14-1911	Arlington	Elkhorn	Completed	13241 30
Rock & Keya Paha	7-11-1911	Carns	Niobrara	Completed	23045 00
Rock & Keya Paha	7-31-1911	McCully	Niobrara	Completed	16428 03
Red Willow	8-10-1911	Bartley	Republican	Continued	
Platte	9-22-1911	Monroe	Loup	Completed	44094 26
Dodge & Saunders	4-25-1912	North Bend	Platte	Completed	98597 17
Scotts Bluff	1- 6-1912	McGrew	North Platte	Completed	27424 61
Lancaster	1-10-1912	Fourteenth St.	Salt Creek	Refused	
Sherman	1-10-1912	Loup City	Middle Loup	Completed	24962 16
Dawson	2-13-1912	Lexington	Platte	Contract let	*45000 00
Merrick	3- 7-1912	Prairie Island	Platte	Continued	
Howard	3-30-1912	Boelus	Middle Loup	Continued	
Dodge & Saunders	4-25-1912	Fremont	Platte	Completed	94234 59
Howard	4- 8-1912	St. Paul	North Loup	Refused	
Nance	5- 4-1912	Genoa	Loup	Completed	31498 75
Lincoln	5-10-1912	Sutherland	North Platte	Contract let	*38000 00
Howard	8-13-1912	St. Paul	Middle Loup	Pending	
Furnas	2- 2-1913	Cambridge	Republican	Completed	22406 30
Douglas	3-19-1913	Valley	Elkhorn	Pending	
Merrick	4-23-1913	Central City	Platte	Pending	
Nuckolls	10-20 -13	Superior	Republican	Plans ready	*24000 00
Lincoln	11-28 -13	North Platte	North Platte	Plans ready	*50000 00
Dawson & Phelps	2-11-1914	Overton	Platte	Contract let	*45000 00
Dawson	2-11-1914	Willow Island	Platte	Pending	

*Estimated

STATE AID BRIDGE LEVY

1911 Levy, $83,134; estimated amount collectible 94%, $78,146.06.
1912 Levy, $92,764; estimated amount collectible 94%, $87,113.56.
1913 and 1914 Levies will be approximately the same as the 1912 levy.

Bridgeport and Bayard State Aid Bridges, North Platte River, Morrill County

For the above two bridges this office prepared designs of two concrete bridges, one being a girder consisting of twenty-three 33′ spans with a twelve-foot roadway and a sixteen-foot turnout in the middle of the bridge; the other being fifteen 50′ concrete arches with a twelve-foot roadway and a sixteen-foot turnout in the middle of the bridge. These bridges were to be approximately eight hundred feet long with an earth fill approximately fifteen hundred feet long on the south end made necessary by the narrowing of the river channel.

Bids were received and opened at Bridgeport on February 20, 1912. The lowest bid was submitted by a contractor who had no experience in building structures of this character and who lacked the necessary financial backing to handle the job. His bid was so much below the actual cost of the bridge that it was evident that he would be unable to complete the work and for this reason his bid was rejected. The contract for both bridges was let to J. L. Mullen of Lincoln who bid on the girder type of bridge only.

The fills were made of sand from the bed of the river and were covered with one foot of dirt and this in turn was covered with four inches of coarse gravel in order to make a compact roadbed on the sand. There is also a dirt and gravel fill one foot in depth across the bridges which prevents wear on the concrete of the floor of the bridge.

The turnout on the Bridgeport bridge was increased in size from 16′x100′ to 20′x100′. An open well was constructed on one pier in which at some future date the Department will install an automatic recording gauge to be used in connection with the hydrographic work.

The bridges were completed during the summer of 1914 and have since been in continuous use. The total cost of the Bayard bridge was $23,335.32 of which amount the state paid $11,667.66. The total cost of the Bridgeport bridge was $25,743.63, of which amount the state paid $12,871.82. Cuts of the old and new bridges appear in this volume.

BAYARD STATE AID BRIDGE, NORTH PLATTE RIVER

Arlington State Bridge, Elkhorn River, Washington County

The plans prepared for this bridge consisted of a steel bridge of a single one hundred and eighty-foot span with a sixteen-foot roadway, or a concrete bridge consisting of two ninety-foot spans with a fourteen-foot and a sixteen-foot roadway. These bids were opened at Blair, Nebraska, and the contract awarded to E. S. Beaty of Blair, Nebraska, for the steel bridge, with a wood block floor and concrete abutments. The The bridge was completed about June 1, 1913, and has since been in continuous use. The total cost was $13,241.30, of which amount the state paid $6,620.65.

Carns and McCully State Aid Bridges, Nibrara River, Rock and Keya Paha Counties

The original plans for the Carns bridge called for two one-hundred and sixty-foot steel spans with a sixteen-foot roadway.

Bids were received on this design and opened at Springview, Nebraska, on August 28, 1911. From the bids received it was evident that there had been no competition in the bidding and the bids were all rejected. New plans were made and the contract finally let in conjunction with the contract for the McCully bridge at Springview, Nebraska, on May 7, 1912. The plans, as finally submitted for the Carns bridge, consisted of six 50' concrete arches, 14-foot or 12-foot roadway, or eight 40' concrete girders, 14-foot or 12-foot roadway, or four 80' steel spans with 16-foot roadway.

The plans for the McCully bridge consisted of five 50' concrete arches, 14-foot roadway or 12-foot roadway; seven 40' concrete girders, 14-foot or 12-foot roadway, or four 70' steel spans, 16-foot roadway.

The contract was awarded to the Lincoln Construction Company for the concrete arch bridges with fourteen-foot roadways for both bridges.

The piers of the Carns bridge rest on steel tubes filled with concrete; two sixty inches and one twenty-four inches in diameter, twenty feet long, under each pier. The two sixty-inch tubes support the pier proper and the twenty-four-inch tube is under the upsteram end of the ice breaker. Four wooden piling are driven in each of the large tubes extending twelve feet below the bottom. The small tubes contain one pile driven in a like manner.

The bridge has three hundred feet of clear waterway and the total cost was $23,045.00, of which amount the state paid $11,522.50.

The McCully bridge rests on shale at an average depth of eight feet below the bed of the river, and has a clear waterway of two hundred fifty feet. The total cost was $16,428.03, of which amount the state paid $8,214.01.

These are the first concrete bridges built across the Niobrara. They were completed and opened to traffic during the summer of 1913 and have since been in continuous use. Cuts of these bridges appear in this volume.

Monroe State Aid Bridge, Loup River, Platte County

The plans of this bridge consist of six 136-foot, 6-inch steel spans and one 80-foot steel span with sixteen-foot roadway. Bids were received and opened at Columbus, Nebraska, on May 14, 1912. The contract was let to the Omaha Structural Steel Works, of Omaha, Nebraska, which company completed the contract during the summer of 1913, after experiencing considerable difficulty with the ice, when it broke and went out in the spring. At this point the ice makes trouble in the spring when it breaks up and begins to move down the river causing numerous ice jams and the resulting floods caused by the water leaving the banks and inundating the low bottom lands. This condition is liable to exist at any point between St. Paul and Columbus on the Loup and between Columbus and Plattsmouth on the Platte, and has been taken into consideration in the designing of bridges for these rivers. The spans are made as wide as possible for economical construction and the upstream ends of the piers are equipped with concrete ice-breakers protected on the peak by an 8"x8"x3-4" angle.

The total cost of the Monroe bridge was $44,094.25, of which amount the state paid $22,047.13. It is to be lamented that after the expenditure of this amount of money to procure a substantial crossing of the river the county officials find themselves unable to surmount local difficulties in procuring a suitable road thereto. Elsewhere in this volume appears a cut of this bridge showing ice as it moves out in the spring.

North Bend State Aid Bridge, Platte River, Dodge and Saunders Counties

The plans of this bridge consisted of eight 180' spans, steel, with sixteen-foot roadway, and concrete piers and abutments, with earth fill at the north end approximately fifteen hundred feet long. Bids were received and opened at Wahoo, Nebraska, May 25, 1912. The contract was let to Stupp Brothers Bridge and Iron Company, of St. Louis, Missouri, for the steel bridge with crosoted wood block floor.

The contractor on this bridge sub-let the concrete substructure, the wood block floor and the earth fill. The sub-contractor was unfortunate in procuring a foreman who had no knowledge or experience with concrete work in water, and the result was that when the bridge was nearing completion a careful inspection was made and the concrete was found be defective, and it was necessary to remove a considerable amount from each pier and replace it with new. The contractor was very arbitrary in this, and it was only after prolonged and heated argument that he could be persuaded to do the necessary work to prove the instability of the concrete. However, once the contention proven, the contractor did all in his power to expedite the reconstruction.

Another cause of delay was the shifting nature of the bed of the river. During the construction of the bridge the main river channel moved from the south bank of the river where the bridge was being built to the north bank, approximately a thousand feet north of the bridge and turning the river back under the bridge was so difficult a construction problem that numerous parties freely predicted failure. The work was undertaken by the Standard Bridge Company of Omaha, Nebraska, who placed the fill by means of a six-inch centrifugal pump and a twenty-horse power traction engine mounted on a barge and pumped sand from the bottom of the river on the upstream side of the fill. As the fill progressed the river channel was narrowed and considerable difficulty was encountered in closing the last sixty feet of the gap between the bank and the bridge.

This was accomplished only after driving six or seven rows of forty-foot piling approximately five feet centers across the opening, wiring these together with one-half and three-quarter-inch twisted wire cables and dumping in sixty thousand bags of sand. Elsewhere in this volume appears cuts showing this work in progress and the completed fill. Attention is called to the huge stacks of sand bags piled on either side of the gap. These and thousands in addition were eventually used.

When this fill was completed the surface was covered with one foot of gumbo and this in turn received a four-inch covering of sand, and this surfacing was ploughed, disced, harrowed, floated and crowned and since the opening of the bridge for traffic has been dragged and is at present in splendid condition and is a good sample of the kind of roads it is possible to build in this state.

The river end of this fill is protected on the upstream side by a willow mat similar in construction to that used on the fill to the Fremont bridge, a discussion of which is given under the Fremont bridge.

The bridge was finally completed and opened for traffic in September, 1914. The completed structure cost $87,084.98, of which amount the state paid $43,242.48.

McGrew State Aid Bridge, North Platte River, Scotts Bluff County

The plans for this bridge consisted of fifteen 50′ concrete arches with twelve-foot or fourteen-foot roadways, or twenty-three 33′ concrete girder spans with twelve-foot or fourteen-foot roadways. Bids were received and opened at Gering, Nebraska, May 28, 1912. The contract was let to J. L. Mullen for the girder bridge complete, with fill of approximately fifteen hundred feet.

This bridge is built in two sections with an earth fill wide enough to be used for a turnout across the island connecting the two sections of the bridge. There is an equalizing channel cut across the upstream side of the island to provide a waterway if at any time the capacity of one section of the bridge should be overtaxed.

The bridge was completed and opened to traffic late in the summer of 1914, and it was necessary for the county to do considerable grading to provide a suitable road to the bridge. The completed structure cost $27,424.61 of which amount the state paid $13,712.31.

Lexington State Aid Bridge, Platte River, Dawson County

Bids on the following types of bridges were received, opened and rejected at Lexington, Nebraska, on June 25, 1914: Reinforced concrete girder with sixteen-foot roadway on wood or concrete piles, 50′ concrete arches with sixteen-foot roadway on concrete or wood piles, balanced arch with sixteen-foot roadway on wood or concrete piles, and rainbow arch with sixteen-foot roadway on wood or concrete piles. The bids were rejected because the Boards present were unable to agree upon the successful bidder.

The bridge was readvertised and the bids were opened at Lexington on September 11, 1914, and the contract let to I. E. Doty of David City, Nebraska, for twenty-five reinforced concrete girders 35′ 6″ center to center of span with sixteen-foot roadway, resting on concrete piles, and to Thomas Gass of Elm Creek, for the fill.

Mr. Doty immediately proceeded to assemble his outfit on the site of the bridge only to be held up by a temporary restraining order issued by the District Court in which one James W. Radcliffe, a tax-payer of Dawson County, was the plaintiff, and the County Boards of Dawson and Phelps Counties and the State Board of Irrigation, Highways and Drainage and I. E. Doty were made defendants. The hearing was held October 13th and 14th, 1914 in Lexington and an opinion rendered in favor of the defendants. The plaintiff alleged that there was insufficient funds to complete the contract but it was proven otherwise at the hearing. Deputy Attorney General Ayres furnished capable assistance in the defense of this suit. This bridge will probably be completed during the year 1915. A list of the bidders and their bids appear in this volume.

BIDS RECEIVED ON LEXINGTON STATE AID BRIDGE AT LEXINGTON
September 11, 1914.

	I. E. Doty David City, Neb.	N. M. Stark Co. Des Moines, Ia.	Monarch Eng. Co. Falls City, Neb.	Thos. Gass Elm Creek.
Reinforced concrete girder—16-ft. roadway on concrete piles	$39790.00	$44950.00	$45550.00	$ .....
50-ft concrete arches—16-ft. roadway on concrete piles	55750.00	.....	.....	.....
Rainbow arch—16-ft. roadway on concrete piles	.....	.....	.....	.....
Extra plain concrete, per cu. yd. in place	8.50	9.75	10.00	.....
Extra reinf. steel, per pound in place	.035	.0325	.0325	.....
Extra Wakefield piling (3-3"x12") per lin. ft. in place	.75	.....	.60	.....
Extra round piling, per lin. ft. in place	.75	.45	.45	.....
Extra st. sht. piling (not less than 30# per sq. ft. in place	1.15	1.25	1.50	.....
Extra Beth.' H's. 8"x32#, per lin. ft. in place	.....	.....	2.00	.....
Extra earth work, per cu. yd. in place	.25	.17	.....	.145
Extra surfacing, per cu. yd. in place	.40	.60	.....	.50
Extra concrete piles (12"x12"), per lin. ft. in place	1.50	1.75	3.75	.....
Extra Willow mat. (18" thick) with cables and conc. anch. sq. yd. in place	3.45	1.75	3.00	.....
Extra rock (protection work), per cord in place	25.00	.....	40.00	.....
Tearing out old bridge and piling on bank complete	1500.00	2000.00	2000.00	.....

Contract awarded to I. E. Doty. Reinforced concrete girders on concrete piles. Contract for earth fill and surfacing awarded to Thos. Gass.

Overton State Aid Bridge, Platte River, Dawson and Phelps Counties

Bids on the following types of bridges were received, opened and rejected at Lexington, Nebraska, on June 25, 1914: Reinforced concrete girder with sixteen-foot roadway on wood or concrete piles, 50′ concrete arches with sixteen-foot roadway on concrete or wood piles, balanced arch with sixteen-foot roadway on wood or concrete piles, and rainbow arch with sixteen-foot roadway on wood or concrete piles. The bids were rejected because the Boards present were unable to agree upon the successful bidder.

The bridge was readvertised and the bids were opened at Lexington on September 11, 1914, and the contract let to I. E. Doty of David City, Nebraska, for twenty-five reinforced concrete girders 35′ 6″ center to center of span with sixteen-foot roadway, resting on concrete piles, and to Thomas Gass of Elm Creek for the fill.

One James W. Radcliffe, a tax-payer of Dawson county, secured a temporary restraining order from the District Court alleging that the bridge fund of Dawson county contained insufficient funds to complete the contract.

The hearing was held October 13th and 14th, in Lexington, and an opinion rendered in favor of the defendants.

A list of the bidders and their bids follows:

GENOA STATE AID BRIDGE, LOUP RIVER

BIDS RECEIVED ON OVERTON STATE AID BRIDGE AT LEXINGTON
September 11, 1914.

	I. E. Doty David City, Neb.	Omaha Structural Steel Works	N. M. Stark Co. Des Moines, Ia.	Pat. Priel Lexington	Thos. Gass Elm Creek
Reinforced concrete—16-ft. roadway, on concrete piles	$37780.00	$45550.00	$44750.00	$	$ .....
50-ft. concrete arches—16-ft. roadway, on concrete piles	52846.00	.....	.....	.....	.....
Extra plain concrete, per cu. yd. in place	8.50	10.00	9.75	.....	.....
Extra reinf. steel, per pound in place	.035	.0325	.0325	.....	.....
Extra Wakefield piling (3-3"x 12"), per lin. ft. in place	.75	.65	.....	.....	.....
Extra round piling, per lin. ft. in place	.75	.46	.45	.....	.....
Extra st. sht. piling (not less than 30# per sq. ft. in place	1.15	1.45	1.25	.....	.....
Extra Beth. H's 8"x32#, per lin. ft. in place	.....	2.10	.....	.....	.....
Extra earth work, per cu. yd. in place	.25	.....	17.	.135	.145
Extra surfacing, per cu. yd. in place	.40	.....	.60	.75	.50
Extra concrete piles (12"x12"), per lin. ft. in place	1.50	3.80	1.75	.....	.....
Extra Willow mat. (18" thick) (with cables and concrete anch.) sq. yd. in place	3.45	2.80	1.75	.....	.....
Extra rock (protection work), per cord in place	25.00	cu. ft. .28	.....	.....	.....

Contract awarded to I. E. Doty. Reinforced concrete girders on concrete piles.
Contract for earth fill and surfacing awarded to Thos. Gass.
Pat. Priel—8"x10"x12" cement block at .11 each.

Loup City State Aid Bridge, Middle Loup River, Sherman County

Plans for this bridge consist of four 120′ steel spans with sixteen-foot roadway and wood block floor. Bids were received and opened at Loup City, Nebraska, June 4, 1912. The contract was let to the Standard Bridge Company of Omaha, Nebraska, who completed the contract during the summer of 1913.

The completed structure cost $24,962.14, of which amount the state paid $12,481.07. Cuts of the old and the new structures appear elsewhere in this volume.

Fremont State Aid Bridge, Platte River, Dodge and Saunders Counties

Plans for this bridge as bid upon consisted of seven 180′ steel spans and three 100′ steel spans with concrete piers and abutments and sixteen-foot roadways. Bids were received and opened at Wahoo, Nebraska, on May 25, 1912. The contract was let for the bridge with a creosoted wood block floor to Stupp Bros. Bridge and Iron Company of St. Louis, Missouri. The design of this bridge has, since letting the contract, been changed to nine 180′ steel spans, doing away with the three 100′ spans. The bridge is practically the same as the North Bend bridge, and was built by the same contractor. It was necessary to rebuild portions of the piers and this occasioned some delay.

The fill was placed with a drag line outfit and the contractor experienced no particular difficulty in completing it. The upstream side of the river end of this embankment is protected by a willow mat approximately six hundred feet long, seventy feet wide and eighteen inches thick. This was woven on the ice and ground, of willows from one inch to two and one-half inches in thickness, and from twelve to twenty feet in length, and is secured to the bank by half and three-quarter-inch wire cables, twelve-foot centers, and fastened to 35′ piling driven at the toe of the slope of the embankment to a depth of approximately twenty-seven feet. The slope on the upstream side of the fill is four to one and the mat extends on this bank to the high water mark and is weighted with rock, old paving blocks and bricks. A portion of the mat was laid on the ice and then enough rock was placed upon it to sink it. During the spring and summer of 1914, the willows showed a decided tendency to sprout, and will furnish an excellent protection in the future. A cut showing the mat, nearly completed, appears elsewhere in this volume. Sufficient quantity of rock was piled on the outer edge and across the body to break the ice and sink the mat to the bottom of the river where it forms a permanent protection from erosion for the fill.

The fill was further protected on the upstream side by quantities of "willow babies" back of the mat. The down stream side, the slope of which is two to one, is protected by two double rows of piling approximately six-foot centers, and the space between filled with "willow babies." These keep the river from whipping back along the fill and prevent any erosion. The abutment and bank on the south side of the river is protected up and down stream by a single row of piling, back of which is piled a number of "willow babies."

The Fremont bridge was opened to traffic in the spring of 1913 and has since been in continuous use. The total cost, exclusive of protection work, was $87,732.89, of which amount the state paid $42,366.36.

Cambridge State Aid Bridge, Republican River, Furnas County

Designs for this bridge included one concrete arch type consisting of two 50′, two 55′ and one 60′ spans, with twenty-foot roadway, concrete piers and abutments; one reinforced concrete girder, consisting of nine 30′ clear spans, twenty-foot roadway, concrete piers and abutments; one steel bridge composed of two 135′ high truss riveted spans, twenty-foot roadway, with concrete floor, piers and abutments; one steel bridge composed of two 135′ high truss riveted spans with twenty-foot roadway, with creosoted wood block floor and concrete piers and abutments.

Bids were opened at Beaver City, Nebraska, on February 26, 1914, and contract awarded to the Lincoln Construction Company of Lincoln, Nebraska, for the concrete arch type of bridge.

The bridge was completed and opened to traffic in November 1914, although the contractor experienced some difficulty and sustained some damages from floods during the process of construction. The completed structure cost was $22,406.30, of which amount the state paid $11,203.15.

A list of the bidders and their bids and a cut of the completed structure appear elsewhere in this volume.

BIDS ON CAMBRIDGE STATE AID BRIDGE

Received at Beaver City, Nebr., February 26, 1914.

	John Gilligan Falls City	Lincoln Const. Co. Lincoln, Neb.	Midland Br. Co. Kansas City, Mo.	Illinois St. Br. Co. Omaha, Neb.	Massillon Br. and Const. Co., K. C., Mo.	Western Br. and Const. Co., Omaha	Mont. J. Green Mankato, Kans.	Elkhorn Const. Co. Fremont, Nebr.
Reinforced concrete arches—20-ft. roadway—complete	$	$18990.00	$	$	$	$23000.00	$21849.50	$ .....
Reinforced concrete girder bridge—20-ft. roadway—complete	.....	22650.00	32000.00	.....	.....	27423.00	.....	.....
Steel span bridge—Con. Fl.—30 ft. roadway—complete	21453.00	20900.00	24420.00	24000.00	24148.00	21732.00	.....	26400.00
Steel span bridge—Wood Bl. Fl.—20-ft. roadway—complete	22000.00	21600.00	23750.00	24000.00	23687.00	20500.50	.....	26100.00
Extra plain concrete, per cu. yd. in place	12.50	15.00	13.50	16.00	12.50	13.00	10.00	12.00
Extra reinforcing steel, per pound in place	.045	.04	.0388	.04	.0375	.0325	.03	.04
Extra Wakefield piling (3-2"x12"), per lineal ft. in place	1.50	1.25	1.70	1.00	1.15	.60	.60	.65
Extra round piling, per lineal ft. in place	.50	.40	.65	.50	.62	.55	.60	.....
Extra 60" tubes (5/16" M-Con. filled) per lineal ft. single tube in place	20.50	21.00	25.00	20.00	19.00	11.00	.....	21.00
Extra fabricated steel, per pound in place	.....	.06	.055	.06	.0575	.07	.....	.07
Extra steel sheet piling at 30# per square ft. in place	1.25	1.25	2.60	1.80	2.50	1.60	.90	1.50
Extra Bethlehem H's (8"x32#), per lineal ft. in place	2.25	2.00	2.60	1.50	2.00	2.50	.....	2.50
Extra earth work, per cu. yard in place	.40	.50	.50	5.00	.40	.25	.25	.40
Extra surfacing, per cu. yard in place	.60	.75	1.50	1.00	1.50	.60	.90	1.40

$2.00 per yard to be added if crushed rock has to be shipped in.

Contract let to Lincoln Construction Co. at $18,990.00 for reinforced concrete arches. 20-ft. roadway.

Genoa State Aid Bridge, Loup River, Nance County

Plans for this bridge consist of five 136′ 6″ steel spans with concrete piers and abutments and sixteen-foot roadway, with plank floor. Bids were recieved and opened on July 16, 1912, at Fullerton, Nebraska. The contract was let to the Massillon Bridge and Structural Company of Kansas City, Missouri, who completed the contract with practically no delay.

The ice breakers were placed on the piers after they were otherwise completed, the County Board deeming them unnecessary primarily and later reconsidering.

The bridge complete cost $31,498.75, of which amount the state paid $15,749.37.

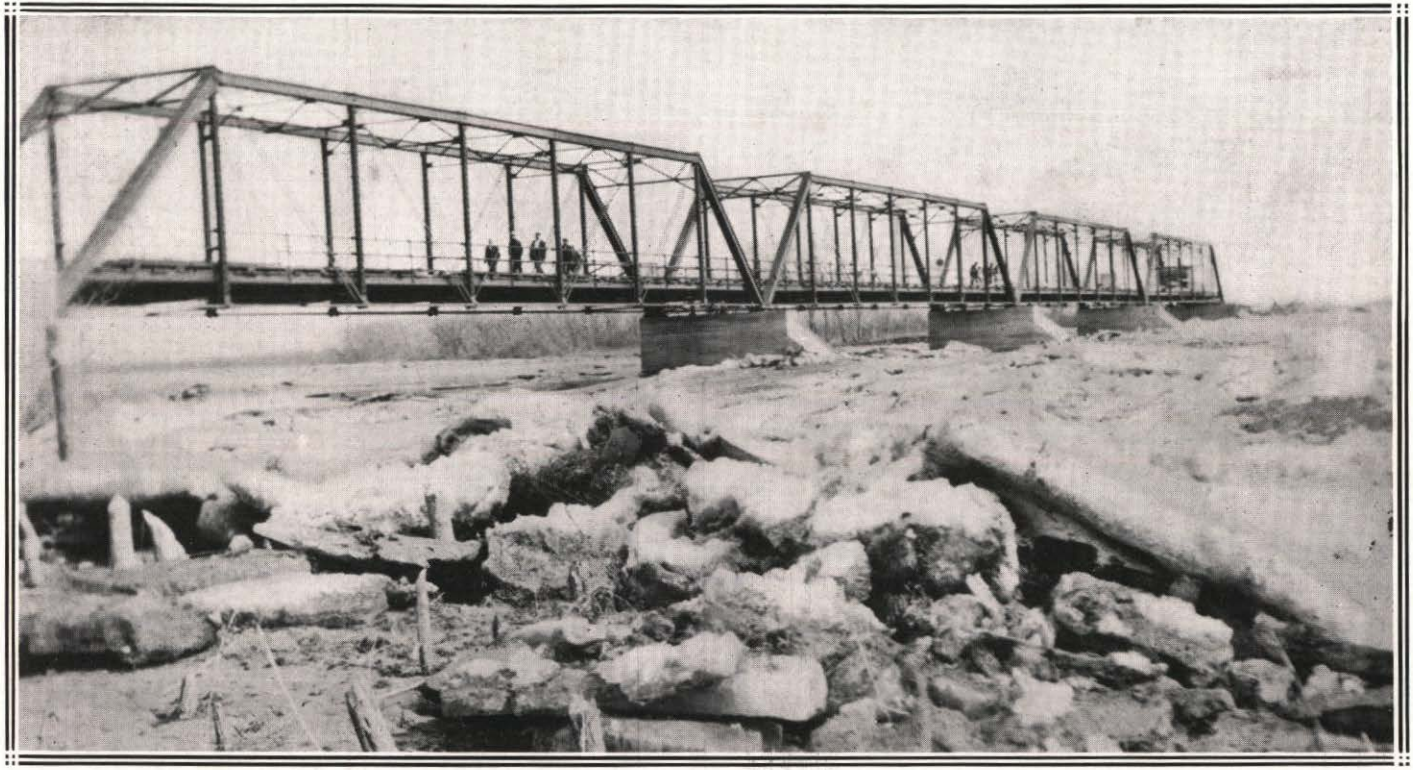
Sutherland State Aid Bridge, North Platte River, Lincoln County.

Designs for this bridge consisted of one reinforced concrete arch type consisting of fourteen 50′ arches with sixteen-foot roadway and concrete piers and abutments, resting on wood piles; one of the same type except that it rested on Bignell Concrete Piles; one concrete arch consisting of fourteen 50′ arches, with twelve-foot roadway, with a twenty-foot turnout over two spans, with concrete piers and abutments, resting on wood piles; one of the same type resting on Bignell Concrete Piles; one reinforced concrete girder bridge composed of twenty-three 33′ spans, with a twelve-foot roadway, and a twenty-foot turnout over three spans, resting on concrete piers and abutments on wood piers; one reinforced concrete girder bridge composed of twenty-three 33′ spans, with twelve foot roadway and a twenty-foot turnout over three spans, with concrete piers and abutments resting on Bignell Concrete Piles.

Bids were received and opened at North Platte on April 7, 1914, and the contract awarded to the Lincoln Construction Company of Lincoln, Nebraska, who have assembled an outfit on the site of the bridge, which is at present in the process of construction, and will probably be finished during 1915. A list of the bidders and their bids will be found elsewhere in this issue.

BIDS ON SUTHERLAND STATE AID BRIDGE
Received at North Platte, Nebr., April 7, 1914.

	Monarch Eng. Co. Falls City, Nebr.	Central Const. Co. Colorado Springs	Midland Bridge Co. K. C., Mo.	J. L. Mullen Lincoln, Neb.	Gould Const. Co. Davenport, Iowa	Lincoln Const. Co. Lincoln, Neb.	Omaha Structural Steel Wks. Omaha, Neb.
Reinforced concrete arches—wood piles. 16-ft. roadway complete	$	$28278.00 +royalty	$	$	$47333.00	$36345.00	$
Reinforced concrete arches—Bignell concrete piles. 16-ft. roadway—complete							
Reinforced concrete arches—wood piles. 12-ft. roadway—20-ft. turnout—complete		20653.00 +royalty			45832.00		
Reinforced concrete arches—Bignell concrete piles. 12-ft. roadway—20-ft. turnout—complete							
Reinforced concrete girder—wood piles. 16-ft. roadway—complete		32500.00		30370.00	55517.00	42180.00	44000.00
Reinforced concrete girder—Bignell concrete piles. 16-ft. roadway—complete							
Reinforced concrete girder—20-ft. turnouts 12-ft. roadway—wood piles		28000.00		29043.00	48000.00		35900.00
Reinforced concrete girder—20 ft. turnouts. 12-ft. roadway—Bignell concrete piles							
Extra—plain concrete, per cu. yd. in place							
Extra—plain concrete, per cu. yd. in place	10.00	8.75	15.00	12.50	8.00	10.00	11.00
Extra—reinforced steel, per pound in place	.03	.036	.03	.035	.0325	.035	.027
Extra—Wakefield piling (3—2″x12″), per lin. ft. in place	.82	.48	.90	1.25	.36 20′to30′ .52	.50	.75



MONROE STATE AID BRIDGE, LOUP RIVER, SHOWING ICE GORGE, SPRING OF 1913

BIDS ON SUTHERLAND STATE AID BRIDGE
Received at North Platte, Nebr., April 7, 1914

	Monarch Eng. Co. Falls City, Nebr.	Central Const. Co. Colorado Springs	Midland Bridge Co. K. C., Mo.	J. L. Mullen Lincoln, Neb.	Gould Const. Co. Davenport, Iowa.	Lincoln Const. Co. Lincoln, Neb.	Omaha Structural Steel Wks. Omaha, Neb.
Extra—round piling, per lin. ft. in place	.50	.49	.50	.40	Over30' .55	.45	.47
Extra—60" tubes 5-16" metal—filled with concrete, per lin. ft. in place	25.00	.....	25.50	22.00	.....	.....	23.50
Extra—fabricated steel, per pound in place	.04	.....	.05	.06	.....	.....	.04
Extra—steel sheet piling (wgt. not less than 30# per sq. ft.) in place	1.25	1.15	1.10	1.25	1.20	1.05	1.07
Extra—Bethlehem "H's" (8"x32#), per lin. ft. in place	2.25	.....	2.35	2.50	.....	1.28	2.25
Extra—earth work, per cu. yd. in place	.18	.90	.175	.12	.25	.15	.15
Extra—surfacing, per cu. yd. in place	.65	1.50	.75	.50	.90	.75	.60
Extra—Bignell concrete piles, per lin. ft. in place	.....	.....	.....	.....	.....	10" 30'to 33' .80	.....

J. L. Mullen's bid includes 40,000 cu. yds. fill and 2,000 cu. yds. surfacing.
Gould Const. Co. bid includes all fill and surfacing finished job.
Lincoln Const. Co. bid includes 40,000 cu. yds. fill and 2,000 cu. yds. surfacing.
Contract let to Lincoln Construction Co. ,$36,345.00.
Lincoln Const. Co. Own Plan—

16' roadway standard solid rail 30' wood piling.....$29.945
16' roadway spindle rail 30' wood piling..... 30.695
16' roadway solid rail concrete piling 10"x8"x32'..... 31.560

Valley State Aid Bridge, Elkhorn River, Douglas County

The design for this bridge consisted of one 240′ steel span with a sixteen-foot roadway and wood block floor on concrete abutments. Bids were received and opened at Omaha, Nebraska, on April 14, 1914, and all bids were rejected because the lowest bid exceeded the cost plus a reasonable percentage of profit as estimated and prepared by this Department. A list of the bidders and their bids appears elsewhere in this volum.

BIDS ON DOUGLAS COUNTY STATE AID BRIDGE

Received at Omaha, Neb., April 14th, 1914.

	Midland Bridge Co. K. C., Mo.	Monarch Engineering Co. Falls City, Neb.	Miller and Borcherding St. Louis, Mo.	Lana Construction Co. Council Bluffs, Ia.	Minneapolis Steel and Machinery Co. Minneapolis, Minn.	Omaha Structural Steel Works Omaha, Neb.	Western Bridge and Construction Co. Omaha, Nebr.
240-ft. steel span—complete.	$25057.00	$25900.00	$29451.00	$25887.00	$26800.00	$25319.00	$25650.00
16-ft. roadway—wood bl. floor	13.50	15.50	16.00	15.00	17.50	14.85	14.00
Extra—plain concrete, per cu. yd. in place	.03	.03¼	pr.cwt.3.50	.04	.03¾	.03	.03
Extra—reinforced steel, per pound in place	.95	.95	.85	.90	1.10	.88	1.00
Extra—Wakefield piling (3-2″x12″), per lineal ft. in place	.45	.50	.55	.45	.53	.48	.45
Extra—round piling, per lineal ft. in place	24.25	27.00	27.50	24.85	26.00	24.90	25.90
Extra—60″ tubes (5-16″ M.—conc. filled), per lineal ft. in place							
Extra—fabricated steel, per pound in place							
Extra—steel sheet piling, per square ft. in place, 30# per sq ft							
Extra—Bethlehem H's (8″x32#), per lineal ft. in place							
Extra—earthwork, per cu. yd. in place							
Extra—surfacing, per cu. yd. in place							

All bids rejected.

St. Paul State Aid Bridge, Middle Loup River, Sherman County

The designs for this bridge consisted of two 304' steel spans, sixteen-foot roadway, with creosoted wood block floor; and five 145' steel spans with sixteen-foot roadway with creosoted wood block floor.

Bids were received and opened at St. Paul, Nebraska, on April 23, 1914. All bids were rejected because the lowest bid received exceeded the cost of construction plus a reasonable percentage of profit as estimated and prepared by this Department. A table showing the bidders and their bids appears elsewhere in this volume.

BIDS ON ST. PAUL STATE AID BRIDGE
Received at St. Paul, Nebr., April 23, 1914.

	Standard Bridge Co. Omaha, Neb.	Midland Bridge Co. Kansas City, Mo.	Miller & Borcherding St. Louis, Mo.	Massillon Bridge Co. Kansas City, Mo.	Central States Br. Co. Indianapolis, Ind.
2—304-ft. spans and approaches, 16-ft. roadway—compplete	$63800.00	$66000.00	$68000.00	$65970.00	$67250.00
5—145-ft. spans and approaches, 16-ft. roadway—complete	66900.00	68725.00	69970.00	69872.00	70000.00
Extras—plain concrete, per cu. yd	12.50	17.50	13.50	15.00	12.00
Reinforcing steel, per lb	.035	.04	.04	.03	.0325
Wakefield piling 3—2"x12"s, per lineal ft	.75	.80	.90	1.50	.90
Round piling, per lineal ft	.60	.65	.65	1.00	.65
72" tubes metal 5-16"; filled with concrete, single tube per lineal ft	25.50	28.00	30.00	28.90	29.00
60" tubes metal 5-16"; filled with concrete, single tube per lineal ft	21.00	24.10	25.00	25.20	23.00
48" tubes metal 5-16"; filled with concrete, single tube per lineal ft	16.00	16.75	20.00	17.00	15.50
Fabricated steel, per lb	.06	.065	.07	.0595	.065
Steel sheet piling, per sq. ft	2.30	2.50	2.60	1.98	2.70
8"x32# Bethlehem H's, per lineal ft	2.30	2.50	2.60	2.20	2.65
Earthwork, per cu. yd	.50	.60	.75	.50	.60
Surfacing, per cu. yd	2.50	2.95	3.00	2.75	3.00
18" willow mat. per sq. yd	3.50	6.50	5.25	5.00	6.50
Rock, per cord	40.00	42.50	50.00	45.00	50.00
Artificial stone, per cord	40.00	42.50	50.00	45.00	50.00

NOTE: Bids rejected April 28, 1914.

RULES AND REGULATIONS

RULES OF PROCEDURE

Adopted by

STATE BOARD OF IRRIGATION, HIGHWAYS AND DRAINAGE

Governing Matters Coming Before the Department

CLAIMS

Section 6795, Cobbey's Annotated Statutes of Nebraska for 1911, reads as follows: (Same—Determination of priorities.) It shall be the duty of the State Board to make proper arrangements for the determination of priorities of right to use the public waters of the state and determine the same. The method of determining the priority and amount of appropriation shall be fixed by the said Board."

Filing of Claim Affidavit:

1. Claimants of the right to use the public waters of the State of Nebraska for irrigation, power, or other useful purposes, who base their claims upon the law of 1877, upon the law of 1889, or by actual and beneficial use, shall file in the office of the State Engineer, a claim affidavit, which shall be made upon a blank, prepared by the State Engineer, furnished by him free of cost, and filed by him under date of its receipt at his office.

2. This claim shall give the location of the diversion works, the land through which the canal runs, specifically describe the land irrigated, if for irrigation purposes; the location of all dams, flumes, headgates, canals, power house, etc., if for power or other purposes.

The claim shall also set forth the date of beginning construction work, the date of completion, and the time of the application of the water to the beneficial use for which it is claimed.

Upon the filing of any such claim affidavit, the State Engineer shall fix a time and place for the holding of a hearing.

Notices:

Notice of hearing shall be served in the following manner:

1. The State Engineer shall prepare an official notice, setting forth

the time and place of the hearing, together with a general description of the rights claimed, and calling upon all interested parties to appear and protect their rights, to be inserted in a local paper of general circulation in the county in which the diversion works or plant of claimant is locatd, and also in some newspaper of general circulation in the State published at the State Capitol, which notice shall run for four consecutive weeks in said papers at the expense of the claimant.

2. The State Engineer shall send by registered mail a duly certified copy of the above notice to each water user in the watershed, in which the claim is located, as their names and addresses appear on the records in the State Engineer's office, at least thirty days before the date of said hearing, together with a copy of these rules.

3. Letters so addressed, shall be registered, according to the rules of the postoffice department, with a request for a return card, which card when returned, shall be preserved with the papers in such case.

Hearing:

1. A hearing shall be held for the purpose of receiving testimony offered by parties in interest in support of and adverse to the rights claimed and shall be presided over by the State Engineer, or one of his Assistants, as he may designate, who shall keep a complete record of the proceedings thereof.

2. All evidence shall be submitted in typewritten or printed form. If oral, it shall be taken down and transcribed at the expense of the complaintant or contestant offering the same.

3. Claimants may appear in person or by attorney, but appearance must be made at time and place specified for hearing.

4. If any party to the proceedings shall desire to take the testimony of witnesses residing outside of the State, or whose attendance cannot be secured at any of the times and places fixed by the State Engineer, the testimony of such witnesses may be taken by deposition in the same manner and upon the same notice of that required for the taking of depositions in cases pending in the District Court.

5. The State Engineer shall have the power to limit the time for the completion of the taking of the testimony.

6. When the taking of such testimony shall be completed, or the time fixed for the completion thereof shall have expired, the State Engineer shall fix the time for hearing argument upon the evidence taken, and permit interested parties to file briefs.

Opinion:

1. Upon the receipt of the written testimony, taken at the hearing and any other investigations that the State Engineer may deem necessary to make, and briefs, if presented, there shall be rendered an opinion of facts and of law based upon the evidence presented.

2. Upon the rendition of a decision, the State Engineer shall forward a duly authorized copy of the same by registered mail to all

interested parties or their attorneys making an appearance of record in said hearing, as their names and addresses appear upon the records in the State Engineer's office, together with a copy of these rules. Return registry cards shall be requested and filed with papers in such cases.

Rehearings and Contests:

1. Any person deeming himself aggrieved by any decision may at any time within thirty days after receipt of such decision file with the State Engineer a petition for a rehearing. Said petition shall set forth the grounds relied upon for a rehearing and be duly verified.

2. In case sufficient reasons are found in the petition, provided for above to grant a rehearing, the petitioner will be notified of the same by the State Engineer.

3. Notices of holding of rehearings shall be given by mail to interested parties or their attorneys appearing of record.

4. The said rehearing shall be held at a time and place designated, and interested parties may file briefs and oral argument may be made and limited to a reasonable time. In general, rules governing the original hearing shall apply to rehearing.

5. A contest against a claimant shall not be heard until after the rendition of a decision on the claim.

APPLICATIONS

Any application made in accordance with the Irrigation Laws of the State of Nebraska to appropriate any of the public waters of the State shall be acted upon in the following manner:

Blanks:

1. Applications shall be made on blanks furnished by the State Engineer's office free of charge.

2. All questions shall be fully and carefully answered.

3. A careful drawing on township plat, showing all streams with their names, canals and other improvements should be made; if for irrigation, land to be irrigated must be carefully shaded.

4. If application for permit to irrigate, owners of land should acknowledge their consent to have their lands watered through the allowance of the proposed application before a notary.

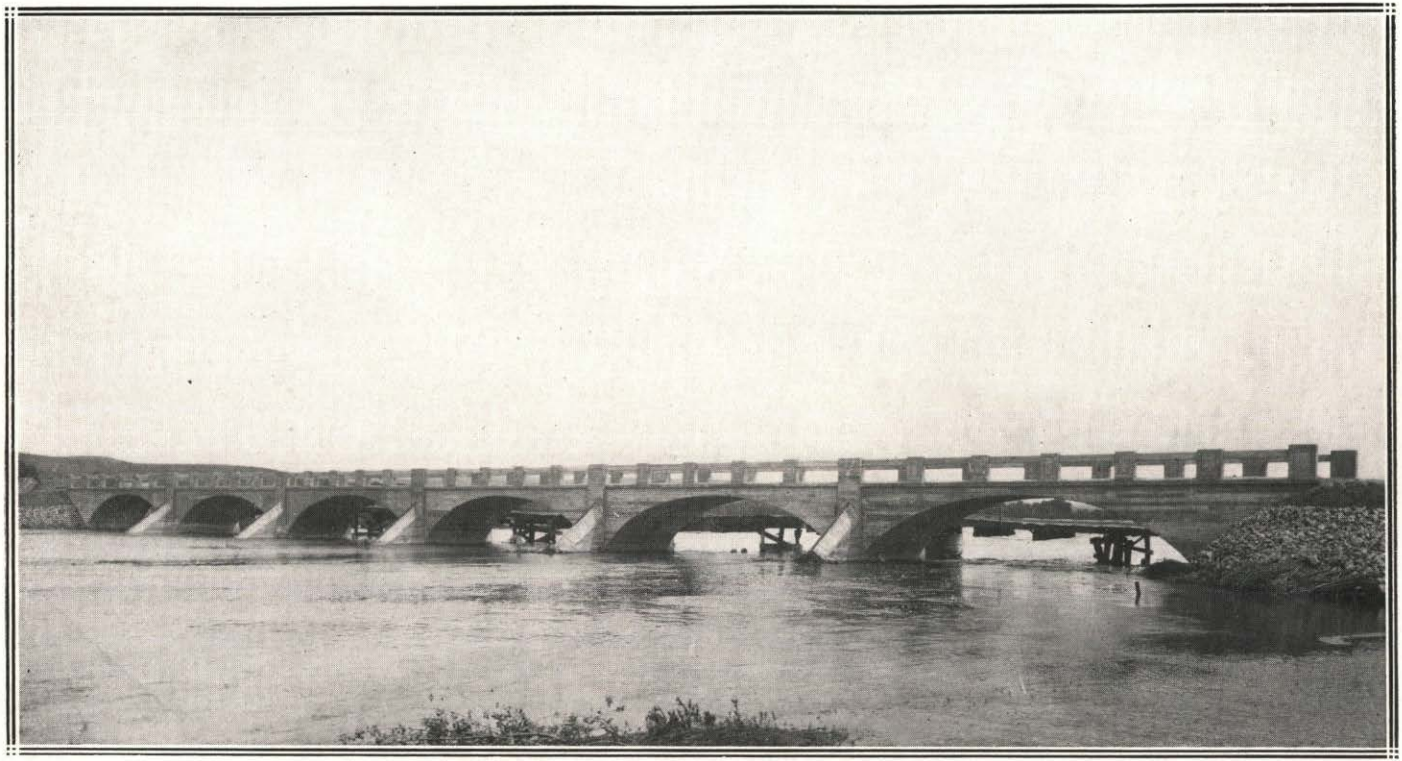
Filing Fees:

1. IRRIGATION—$5.00 for each 1,000 acres irrigated or fraction thereof.

2. STORAGE—$5.00 for each 5,000 acre feet or fraction thereof stored.

3. POWER—$5.00 for each 50 theoretical horsepower or fraction thereof.

Rule on determining theoretical horsepower: The amount of theoretical water horse power upon which fees shall be paid under the pro-



CARNS STATE AID BRIDGE, NIOBRARA RIVER

vision of Section 6918 of Cobbey's Annotated Statutes of Nebraska for 1911, shall be computed by multiplying the maximum amount of water claimed or diverted, expressed in cubic feet per second, by the average total fall utilized, expressed in feet, and dividing the product by 8.8.

Filings:

Upon the receipt of the State Engineer's office of an application accompanied by the proper filing fee, the application shall be filed under date received and duly recorded.

Corrections:

1. Thirty days shall be given after the date of filing for the State Engineer to examine an application and if any defect is found therein, to return the same to the applicant for correction with the endorsement of the State Engineer upon the same, as to the corrections desired.

2. If application is returned, corrected within thirty day limit it shall take priority of original filing.

Action Taken:

1. The State Board, through the State Engineer, shall approve or dismiss the application according to the results of his investigation of the same, as set forth by law.

2. The State Engineer shall return to the applicant by registered mail his application, with the endorsement of the State Engineer thereon, accompanied with a copy of these rules. Registry receipts shall be requested and filed with the papers in above case.

3. Upon the receipt of an approved application by the applicant the applicant shall be duly authorized to begin work of construction.

Work:

((Prosecution of Construction.) Within six months ofter the approval of any application for water for irrigation, power or other useful purpose under this act by the State Board of Irrigation the person or persons, corporation or association making such application shall commence the excavation or construction of the works in which it is intended to divert the water, also the actual construction of any water power plant and reservoir or reservoirs for storage in connection therewith, and shall vigorously, dilligently and interruptedly prosecute such work to completion unless temporarily interrupted by some unavoidable and natural cause, and a failure to comply with this section shall work a forfeiture of the appropriation and all rights thereunder.

Provided further that the cost of promotion and engineering work

shall not be considered as a part of the cost of construction, and that the progress of the construction work shall be such that one-tenth of the total work shall have been completed within one year of the date of approval of the application. The applicant shall at the end of six months after the allowance of his application furnish to the State Board a detailed report of the total amount of work necessary to complete the project, which report shall conform to the requirements of the State Engineer, together with satisfactory evidence that the work of construction has been begun.

Provided also that the construction of all work required in connection with the proposed project shall be prosecuted in the manner above described and with such a force as shall assure the average rate of constructional progress necessary to complete such work or works within the time stipulated in the approval of such application, notwithstanding the ordinary delay and casualities that must be expected and provided against, to assure the completion of the project within a time certain.

Provided, further, that in the case of an application for an appropriation granted for the development of water power, it shall be the duty of such grantee, on or before the 10th day of each month after the date fixed for the commencement of such work to report under oath to the State Board of Irrigation the actual amount of money expended upon such power development during the preceding calendar month for right of way and land, labor, salaries, material and machinery, not including construction, equipment delivered upon the ground, and said report shall be made in form, detail and manner prescribed by said Board. A failure to carry on the construction of either an irrigation or water power project, as outlined above, or in the case of a water power development, to fail to file the above reports within the time required, shall work to forfeiture of the appropriation and all rights thereunder and the State Board shall cancel said appropriation within thirty days of such failure.

Provided further, the State Engineer or his assistants shall have free access to all records, books and papers of any irrigation or water power company and have the right to go upon the right of way and land of any said company, and shall inspect said works to see that it is being done according to plans and specifications approved by the State Engineer's office and shall also keep a record of the cost of construction work where the same is deemed advisable for physical valuation purposes.

Maps:

Sections 6808 of Cobbey's Annotated Statutes for 1911 reads as follows: (Map—Plat—Penalty.) Upon the approval and allowance of an application, the applicant shall file in the office of the State Board of Irrigation, Highways and Drainage, within six months thereafter, a map or plat, which map or plat shall be made to confirm to the rules and regulations of said Board as to material, size and coloring, and upon a scale

of not less than two inches to the mile. Such map or plat shall show the source from which the proposed appropriation is to be taken, and all proposed dams, dykes, reservoirs, canals, power houses and any other structures for the purpose of storing, conveying or using the water for any purpose whatsoever under the irrigation law of this State, and their true courses or positions in connection with the boundary lines and corners of land which they occupy, and when lands are listed for irrigation, such lands must be shown in government subdivisions, or fractions thereof, as the case may be, and no rights shall be deemed to have been acquired until this section of the Statutes shall have been compiled with, and a failure to comply with this section shall work a forfeiture of the appropriation and all rights thereunder.

2. (1) All maps filed to comply with the above law, must be on tracing cloth 14 inches wide and 16 inches long, with a one inch margin on the top, bottom and right hand end and a three inch margin on the left hand end for binding. Where the whole area cannot be shown on one sheet, additional sheets must be used, each sheet representing a township, until the whole area is covered.

(2) Short ditches and small areas must be made on a scale of 4, 6 or 8 inches to the mile, where, by using such scale, the area of the map will not exceed 12 inches square. In all other cases, where this cannot be done and where larger areas are to be shown, a scale of 2 inches to the mile is used.

(3) The position of the headgate must be indicated by some tie to a government section or quarter section corner, giving the course and distance therefrom. The course of the ditch or canal must also be shown.

(4) At intersection of section lines the distance from the nearest government corner to the center line of the ditch must be given in feet and where the land reclaimed is fractional, the fractional area to be irrigated, of each quarter-quarter section must be marked on plat in acres.

(5) The center line of the proposed canal must be in red. Any other canals and all streams and drains must be in medium blue. The area proposed to be irrigated must be carefully shaded in light red. If topography is shown by contour lines, such lines must be in burnt sienna. All other matter, such as hatching, land lines, lettering, figures, etc., must be in black.

(6) All maps must be made from actual measurments on the ground and properly certified by some competent engineer or surveyor.

(7) The presumption of the law is, that after a permit is allowed, it will require not more than six months to make the proper surveys, get the necessary information and construct and file required map.

(8) The following certificates must be printed upon the first sheet properly filled out and signed:

State of Nebraska
.....County } ss.

I hereby certify that the survey of..... was made under my direction, and is accurately represented on this map consisting of .....sheets.

.....
Engineer (or Surveyor)

Dated.....191.....

State of Nebraska
.....County } ss.

I hereby certify that this map consisting of.....sheets was made with my full knowledge and consent, and at my request, and correctly shows the location and course of the distributing works, the source from which the appropriation is taken, and the legal subdivisions of the land upon which the water appropriated is to be applied, as shown by Application No....., filed in the office of the State Board of Irrigation on the.....day of.....

Dated.....19.....

(9) If the appropriation is for any purpose other than irrigation, this certificate must be so worded as to agree with the facts.

(10) At the time an application is filed, a preliminary map is to be made upon the township plats accompanying the blanks furnished by this office, and which is made a part of the application, and the applicant should follow out the foregoing instructions as to color and shading and such other matter as is possible to gather and place upon a preliminary map. This map must contain sufficient data upon which to base an opinion in handling the application.

Contests and Hearings:

1. An person deeming himself aggrieved by any decision may at any time within thirty days after the receipt of such decision, file with the State Engineer a petition for a hearing. Said petition shall set forth the grounds relied upon for such hearing and must be duly verified.

2. In case sufficient reasons are found in the petition, provided for above, to grant a hearing, the time and place for holding the same shall be set and notices of the same shall be given interested parties by registered mail by the State Engineer thirty days in advance of the holding of said hearing.

3. Interested parties may file with the State Engineer a brief, and also appear in person to introduce evidence and make oral argument.

4. A duly verified copy of a final decision shall be sent to all in-

terested parties making an appearance, by registered mail by the State Engineer.

5. After the allowance of an application, contests may be brought by an interested party to show that the applicant has not faithfully complied with the Irrigation Laws of this State, or that the proposed project is a detriment to the public welfare.

6. An applicant feeling himself aggrieved by the opinion rendered by the State Board in the hearing had, may institute proceeding in the Supreme Court of Nebraska to reverse, vacate or modify the order complained of, the procedure to obtain such reversal, vacation or modification of any such decision or order made and adopted upon which a hearing has been had before said Board, shall be governed by the same provisions in force with reference to appeals and error proceedings from the district court to the Supreme Court of Nebraska. The evidence presented before the Board as reported by its official stenographer and reduced to writing, shall be duly certified to by said stenographer and the chairman of the State Board as the true bill of exceptions, which, together with the pleadings and filings duly certified in said case under the seal of the State Board shall constitute the complete record, and the evidence upon which the case shall be presented to the appellate court, provided, however, that the time for appeal from the orders and rulings of said Board to the Supreme Court shall be limited to sixty days.

DAMS

Plans and specifications of dams and petitions for approval of same.

(Dam: reservoir.) Any person, corporation or association hereafter intending to construct any dam for reservoir purposes or across the channel of any running stream, shall before beginning such construction, submit the plan of the same to the State Board of Irrigation, Highways and Drainage for their examination and approval, and no dam shall be constructed until the same shall have been approved by such board. Any person constructing such a dam across the channel of any running stream without having obtained the consent and approval of the State Board therefor, shall be guilty of a misdemeanor and upon conviction thereof, shall be fined in any sum not exceeding $100 and stand committed until the fines and cost are paid, and for every day that such dam so unlawfully constructed is maintained, it shall be considered as a new offense and as a new violation of the provision hereof and it shall be the duty of the secretary of the State Board to cause the provisions of this act to be strictly enforced

Drawings:

The drawings representing the plan of a proposed dam should be made with a good quality of India ink upon sheets of tracing cloth 14 inches wide, 16 inches long with a three inch margin on the left hand end for binding (but extra lengths not to exceed 30 inches, are allowable

if necesary) as many such sheets to be used as requirements demand. These drawings must be numbered and given a proper title. They must include:

1. A map of the site showing the position of the dam, the meanders of the stream and the flow line boundaries of the reservoir, all properly connected to land lines and government corners, also the surface and area of the reservoir and the cubic contents in acre feet.

2. A cross section of the stream where the dam is to be built, showing the surface of the ground in profile with a sufficient number of soundings to indicate the underlying formation, the elevation of the dam and spillway, the surface of the impounded water and such openings or conduits through the dam as are contemplated.

3. A sketch of the dam in plan, or as viewed from above, outlining the top and slope lines of the dam, the water line, spillways, side walls, buttresses, etc.

4. Cross sections of the dam at several points such as will show the mechanical construction of the different parts.

5. Specifications must accompany the drawings, explaining them and setting forth the material to be used and the methods of construction in clear, plain and unmistakable terms.

6. Drawings must be certified by some competent engineer and also by applicant with a certificate of the general form of the one set forth under maps of application.

Petition for Approval:

Following is a general form of petition for approval of plans which can be varied according to requirements. This petition should show whether the petitioner is an individual, a partnership or a corporation and by what authority the waters of the State of Nebraska are appropriated.

BEFORE THE STATE BOARD OF IRRIGATION, HIGHWAYS AND DRAINAGE

In the matter of the Petition for Approval of plans for the Construction of a proposed dam under application No..... made by..... to appropriate the waters of the State of Nebraska for .....

To the Honorable State Board of Irrigation, Highways and Drainage:

Comes now your petitioner.....and states:

1. That he is the original applicant for the appropriation of water from.....in the .....¼.....¼.....of Section.....T.....N., R.....in.....County, Nebraska, under Application No....., filed in your office.....19...., and approved.....19.....

2. That in order to carry out, perfect and consummate the object of said appropriation, it is necessary to construct a dam across said .....to a height of more than ten feet, and according to the laws of the State of Nebraska, in such cases made and provided a plan of such proposed dam must be submitted to the State Board for their examination and approval, which approval must be obtained before such proposed dam can be constructed.

3. That your petitioner has employed engineers to make proper soundings and other measurements at the site of the proposed dam and to make plans and specifications for the proper construction of the same, which specifications are submitted herewith with plans marked: Sheet No. 1, General Map; Sheet No. 2, Cross Section of dam site, showing borings; Sheet No. 4, Details of Dam with cross sections; Sheet No. 5, Details and location of power house; each of said sheets being also marked "....." and each of said sheets, with the specifications, being made a part of this petition.

Wherefore your petitioner prays that plans and specifications as above described and as submitted herewith be approved and that such order be made by this Board as shall be just and equitable to this petitioner.

.....

State of Nebraska
.....County } ss.

.....being first duly sworn upon his oath says that he is the original appliant for an application of water under Application No..... and that the matters and facts set forth in the foregoing petition are true as he verily believes.

.....

Subscribed in my presence and sworn to before me this..... day of.....19.....

.....

Notary Public.

In cases where the petition is a corporation and in cases where transfers have been made, the following forms of statements are suggested, but in all cases the facts must be shown, and the petition verified to correspond:

'Comes now your petitioner.....and states that it is a corporation duly organized and existing under and by virtue of the lws of the State of Nebraska, being organized for the purpose of....."

"That on the.....day of.....filed in your office Application No....., for a permit to appropriate the waters of the State of Nebraska, which application was on the.....day of..... approved by this Board."

"That on the.....day of.....said.....assigned to this petitioner all of his rights and privileges under said permit, and that this petitioner then undertook to fulfill the conditions necessary to complete the appropriation contemplated under said permit."

Where the petitioner is a partnership, the statement should read:

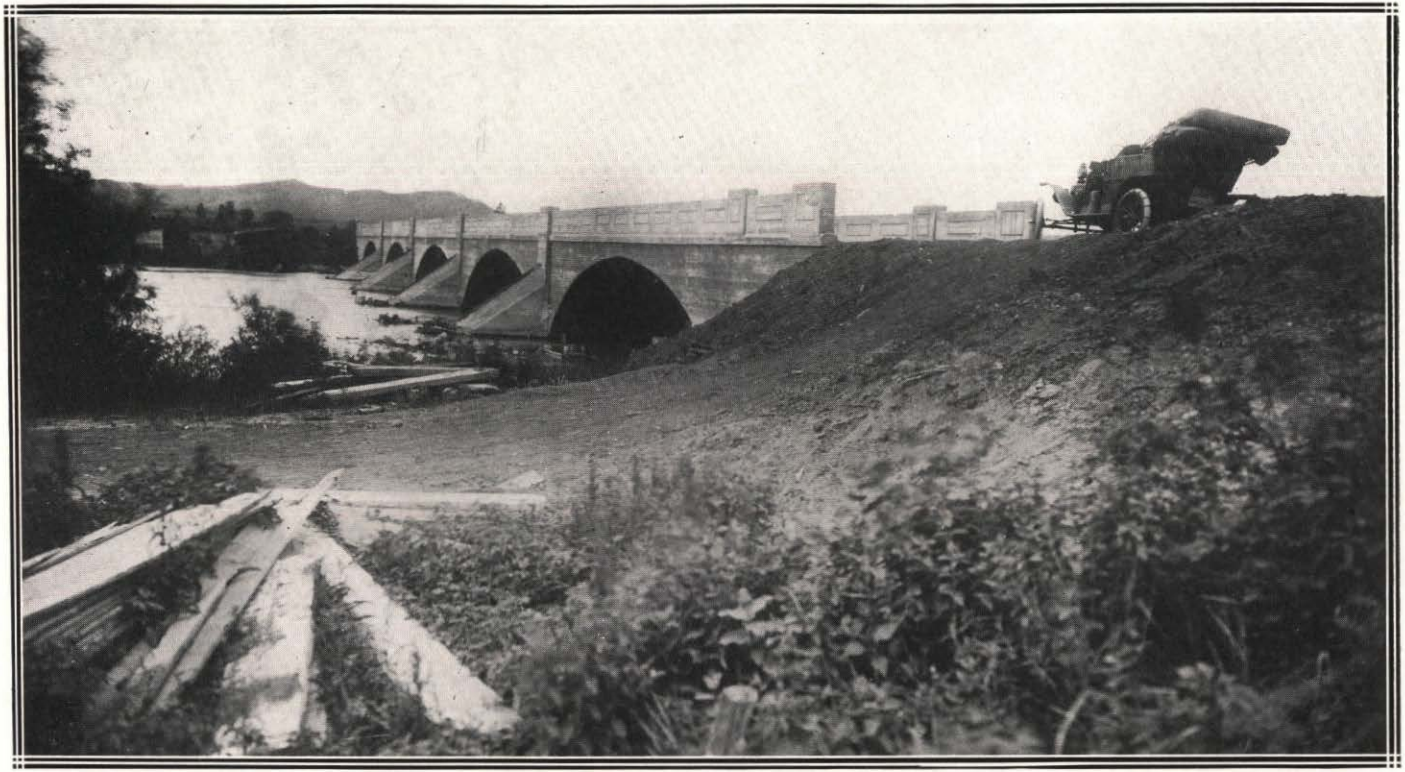
"Comes now your petitioners.....and state that they are a partnership doing business under the name and style of .....

Action:

1. Upon receipt of plans of a dam and petition for approval of the same, they shall be filed under date of arrival and the plans shall be given an official number for filing purposes.
2. The State Engineer may require more complete data than that shown upon plans and specifications or may require changes in the same as in his judgement is best and shall have the right to return plans and specifications for corrections.
3. If at the discretion of the State Engineer, or upon request of any person, he deem it necessary a personal inspection shall be made of the of the proposed dam site.
4. The State Engineer shall first act on the plans and specifications for a dam, which action shall be subject to the approval of the State Board.
5. In approving plans of a dam of any kind the right is always reserved by the State Engineer to inspect said work while being built and order any changes he may deem necessary. Also after a dam is built, he may order changes or repairs as he may deem proper for public safety.

Contests and Hearings:

1. Any person deeming himself aggrieved by any decision may at any time within thirty days after the receipt of such decision file with the State Engineer a petition for a hearing. Said petition shall set forth the grounds relied upon for such hearing and must be duly verified.
2. In case sufficient reasons are found in the petition provided for above to grant a hearing, the time and place for holding the same shall be set, and notices of the same shall be given interested parties by registered mail by the State Engineer fifteen days in advance of the holding of said hearing.
3. Interested parties may file with the State Engineer a brief and also appear in person to introduce evidence and make oral argument.
4. A duly verified copy of a final decision shall be sent to all interested parties by registered mail by the State Engineer.
5. After the approval of dam plans, contests may be brought by any interested party to show that the applicant has not faithfully complied



McCULLY STATE AID BRIDGE, NIOBRARA RIVER

8. At the time and place designated for hearing, each party shall produce his evidence, the contestant opening and closing.

9. Continuances may be granted at the discretion of the State Engineer to either party at or before the time for hearing upon good cause shown.

10. The testimony offered may be oral or by deposition. If oral, it should be taken down by a stenographer and transcribed at the expense of the party offering the same, except in case of cross examination, the expense of which shall be borne by the opposite party; the stenographer to receive the legal rate per folio therefor, payable at the time such evidence is offered. Depositions submitted must have been taken in accordance with the rules in a court of law.

11. Copies of decisions in matters of contests shall be mailed to parties in interest.

12. If the postoffice address of any person is unknown, then the decision shall be mailed to said claimant in care of the County Clerk of the County within which the claim is located.

Rehearing.

1. Any person deeming himself aggrieved by any decision, may at any time within thirty days receipt of such decision file with the State Engineer a petition for rehearing. Said petition shall set forth the grounds relied upon for a rehearing and be duly verified.

2. In case sufficient reasons are found in the petition provided for above, to grant rehearing, the petitioner shall be notified of the same by the State Engineer.

3. Interested parties may file with the State Engineer a brief and also appear in person to introduce evidence and make oral argument.

4. In general, the case shall be made up and be controlled by the rules governing contests.

The above Rule and Regulations have this day been approved and adopted by the State Board of Irrigation, Highways and Drainage.

JOHN H. MOREHEAD.
President,
GRANT MARTIN,
FRED BECKMAN.

DONALD D. PRICE
State Engineer, Secretary,

Witness by hand and the seal of the State Board of Irrigation, Highways and Drainage, this fifth day of January, 1914.

(SEAL)

CONTESTS

General Rules:

1. Any party desiring to contest a claim shall file with the State Engineer a written notice of contest and petition setting forth the grounds therefor, together with a verified proof of service of notice and petition upon the opposite party. Within fifteen days from the date of service of said notice and petition, the contestee shall file with the State Engineer his answer thereto, if any he desires to make, together with a verified proof of service of a copy of said answer upon the contestant, who shall then have ten days from the date of service of same in which to file with the said Engineer a reply; provided, however, that the State Engineer may extend the time for answer and reply upon good cause shown.

2. Where the contestee is a non-resident or cannot be found within the state, then the said contestant shall file with the State Engineer in lieu of said verified proof of service of notice of contest and petition, an affidavit setting forth the fact, that service cannot be made in the State whereupon the State Engineer shall designate some newspaper published at the county seat of the county within which the original notice of appropriation was filed, in which newspaper shall be published for four consecutive weeks, a notice setting forth the following facts: (a) That such contest has been instituted, together with the name and address of the contestant or his attorney of record; (b) the name of the claimant and the name of the stream from which the contested appropriation is claimed, together with the location of the point of diversion of such appropriation (c) that a notice of contest and petition stating the grounds therefor are on file with the State Engineer; (d) the date upon or before which the answer must be filed by the contestee, which date shall not be earlier than ten days from the last date of publication of notice.

3. On or before the date set for the filing of the contestee's answer, said non-resident or absent contestee shall file the same with the State Engineer, together with a verified proof of service of a copy thereof upon the contestant or his attorney of record.

4. The said petition stating grounds of contest and answer thereto shall be verified.

5. Service upon corporations may be made upon the same officers and in the same manner as provided in the case of a summons issued by a court of law.

6. Proof of publication of the above notice shall be filed with the State Engineer on or before the date set for the filing of the contestee's answer.

7. When the issues have thus been made up, the State Engineer shall set a date and place for taking testimony and the hearing of the cause and each party thereto shall be notified thereof by registered mail.

Wherefore your petitioner prays that the time for completing said canal under said permit granted under Application No..... be extended for a period of at least.....from and after..... or until....., 19.... and the date for the application of water to beneficial use be fixed not earlier than....., 19 , and that such order be made by this Board as shall be just and equitable to this petitioner.

State of Nebraska }
.....County } ss.

.....being first duly sworn on his oath states that he is the original applicant under Application No..... for the appropriation of waters of the State of Nebraska; that he has read the above and foregoing petition and knows the contents thereof and that the facts therein set forth are true, as he verily believes.

.....

Subscribed in my presence and sworn to before me this..... day of.....19.....

.....
Notary Public.

Action:

1. Upon receipt at the State Engineer's Office, the petition shall be filed under date of arrival and shall be acted upon by the State Board through the State Engineer.

Hearing:

1. Any person deeming himself aggrieved by any decision may at any time within thirty days after the receipt of such decision file with the State Engineer a petition for a hearing. Said petition shall set forth the grounds relied upon for such hearing and must be duly verified.

2 In case sufficient reasons are found in the petition provided for above to grant a hearing the time and place for holding the same shall be set, and notice of the same given interested parties by registered mail by the State Engineer thirty days in advance of the holding of said hearing.

3. Interested parties may file with the State Engineer a brief, and also appear in person to introduce evidence and make oral argument.

4. A duly verified copy of a final decision shall be sent to all interested parties by registered mail by the State Engineer.

Fee:

A filing fee of fifty cents shall be charged for filing of above petition.

with the Irrigation Laws of the State, or that the proposed dam is a detriment to the public welfare.

Fees:

1. For examination of plans for any proposed dam, fifty cents for each foot in height and actual expenses while visiting and examining the site thereof.

2. The height of a dam shall be measured from the deepest part of the foundations to the crest or top of the dam.

3. Piling of any sort shall be considered as part of the foundation.

Petitions:

Petitions for extension of time in which to complete work:

Following is a general form of petition for extension of time which can be varied according to requirements. This petition should state whether the petitioner is an individual, a partnership or a corporation and by what authority the waters of the State of Nebraska are appropriated and all transfers of title if any.

Form for Petition for Extension of Time:

BEFORE THE STATE BOARD OF IRRIGATION, HIGHWAYS AND DRAINAGE.

In the Matter of the petition for an extension of time in which to complete work under Application No..... ..... made by..... for a permit to appropriate the waters of the state of Nebraska.

To the Honorable State Board of Irrigation, Highways and Drainage:

Comes now your petitioner.....and states:

1. That he is the original applicant for an appropriation of water from.....in the .....¼.....¼..... of Section.....T.....N., R.....in.....County, Nebraska, under Application No....., filed in your office.....19..... and approved.....

2. Your petitioner represents that he has used due diligence in the prosecution of the work of construction required to complete the ditch, and other work by the time required. (State reasons for cause of delay, which reasons must constitute good and sufficient ground upon which to base an extension of time.)

3. Your petitioner represents that notwithstanding the foregoing hindrances and embarrassments, the causes of delay are now removed, and he is now ready, willing and able to complete said work of construction and the application of water by.....19.....

TABLES

CLAIMS AND APPLICATIONS GRANTED AND PENDING

The following tables give a complete list of all claims and applications for water, which have been granted by the State Board of Irrigation, and which have never been cancelled; also all applications and claims now pending.

In these tables, the claims and applications have been arranged in each water division by streams in alphabetical order, and the appropriations on each stream are arranged in order of their priority and for that stream only.

Range numbers refer to ranges west of the 6th Principal Meridian, unless otherwise indicated.

Those having docket numbers are claims made covering rights acquired under the law prior to April 4, 1895, and those having application numbers are applications for permits to appropriate water made under the law of 1895.

These tables will be found valuable in ascertaining relative rights of apropriators from any stream.

In the following tables Docket and Appro. Nos. are marked with an asterisk (*) where claims are pending before the Department.

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Source	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate S	T	R	County	Date of Priority Month	D	Yr.	Docket No	App. No.
Ash Creek	Vance, Roscoe	Lewellen	Vance Ditch	Irrig.	1.14	27	16	42	Deuel	June	14	1890	765	
Ash Creek	Gillard, George	Lewellen	Gillard Ditch	Irrig.	1.43	3	16	42	Deuel	Dec.	31	1890	812	
Ash Creek	McCormick, C.	Lewellen	McCormick	Irrig.		16	16	42	Deuel				1011	*
Beaver lake	Baldridge, A. F.	Alliance	Beaver	Irrig.	170.	16	20	44	Garden	Aug.	6	1910		1018
Birdwood creek	Eq. Farm & S. Imp. Co.	N. Platte	Birdwood Canal	Irrig.	100.	35	15	33	Lincoln	Oct.	21	1893	646	
Birdwood creek	Eq. Farm & S. Imp. Co.	N. Platte	W. Side Birdwood Canal	Irrig.	8.57	22	15	33	Lincoln	Jan.	16	1894	652	
Birdwood creek	Beauchamp, W.	Sutherland	Beauchamp Canal	Irrig.	3.	15	15	33	Lincoln	Sept.	19	1894	677	
Birdw'd ck. E. B.	McCabe, N.	N. Platte	McCabe Ditch	Irrig.	5.	3	16	33	Lincoln	Mar.	1	1901		602
Birdw'd ck. E. B.	Todd, Willis	Omaha	Lincoln Co. Elec Co.	P'wer		3	15	33	Lincoln	Jan.	9	1913		1251*
Birdw'd ck. E. B.	Birdw'd Irr. & Pow. Co.	Lincoln	Birdw'd Irr. & Pow Co	Irrig.		14	16	33	Lincoln	Feb.	9	1914		1350*
Birdw'd ck. E. B.	Birdw'd Irr. & Pow. Co.	Lincoln	Birdw'd Irr. & Pow Co	P'wer		15	16	30	Lincoln	Feb.	9	1914		1351*
Blue creek	Union Irr. & W. P. Co.	Lewellen	Union Irr. & W. P Canal	Irrig.	24.64	18	16	42	Deuel	May	16	1890	763	
Blue creek	Ia. Irr. & Imp. Co.	Lewellen	Blue Creek Ditch	Irrig.	12.86	6	16	42	Deuel	Sept.	7	1893	781	
Blue creek	Blue Creek Irr. Dist.	Lewellen	Blue Creek Canal	Irrig.	107.29	33	17	42	Deuel	Dec.	27	1893	785	
Blue creek	Ia. Irr. & Imp. Co.	Lewellen	Ia. Irr. & Imp. Co. D.	Irrig.	12.	7	16	42	Deuel	Feb.	24	1894	786	
Blue creek	Graf, Robert E.	Lewellen	Graf Canal	Irrig.	61.43	19	16	42	Deuel	April	2	1894	788	
Blue creek	Winterer, Jacob H.	Lewellen	High Line Ditch	Irrig.	20.	21	17	42	Deuel	Sept.	27	1894	795	
Blue creek	Bergenson, Nels. et al.	Lewellen	West Side Ditch	Irrig.	21.	28	17	42	Deuel	Nov.	20	1894	800	
Blue creek	Paisley Irr. Dist.	Lewellen	Paisley Irr. Ditch	Irrig.	4.	33	17	42	Deuel	July	14	1899		515
Blue creek	Slesser, David	Oshkosh	Fair View	P'wer	62.5	4	18	43	Garden	July	18	1910		1009
Blue creek	J. E. Eggers	Lewellen	The Eggers Extension	Irrig.	.42	33	17	42	Garden	Jan.	4	1912		1154
Blue creek	Delatour, S. P.	Lewellen	Delatour Res.	Stor.		32	17	42	Garden	July	22	1914		374
Brown's creek	Haxby, Geo. H.	Bridgeport	Hackberry Ditch	Irrig.	0.43	19	20	48	Cheyenne	July	17	1903		717

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Source	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Buckhorn spgs.	Maddox, P. P.	Keystone		Irrig.	2.28	8	14	36	Keith	Oct.	3	1908		918
Buffalo creek W.	Henry, Absalom	Cozad	Henry Canal	Irrig.	0.07	23	11	23	Dawson	July	2	1900		570
Camp creek	Wehn, J. H.	Alliance	Camp Creek Ditch	Irrig.	1.43	13	18	49	Cheyenne	Mar.	16	1892	866	
Cedar creek	Radcliffe, Mack	Sidney	Nelson & Radcliffe Ditch	Irrig.	2.77	28	18	48		Jan.	1	1882	1034a	
Cedar creek	Radcliffe, Mack	Sidney	Radcliffe Ditch No. 2	Irrig.	1.23	34	18	48		July	1	1885	1034b	
Cedar creek	Radcliffe, Mack	Sidney	Radcliffe Ditch No. 3	Irrig.	.76	27	18	48		Feb.	1	1890	1034c	
Cedar creek	Major, John	Paxton	Cedar Creek Ditch	Irrig.	1.5	17	14	35	Keith	Jan.	3	1911		1051
Clear creek	Hooper, D. C.	Lewellen	Clear Creek Ditch	Irrig.	2.86	32	16	41	Keith	July	1	1888	748	
Clear creek	Barber, F. H., Marsh, W. F.	Lewellen	Clear Creek Canal	Irrig.	14.57	29	16	41	Keith	May	30	1893	754	
Clear creek	Green, Nelson A.	Lewellen	Clear Creek Ditch	Irrig.	1.14	32	16	41	Keith	May	30	1893	756	
Clear creek	Green, Nelson A.	Lewellen	Green Ditch	Irrig.	1.14	29	16	41	Keith	June	1	1893	745	
Clear creek	Scott, G. T., Williams E. C.	Lewellen	Scott & Williams Ditch	Irrig.	1.	28	16	41	Keith	May	18	1894	747	
Clear creek	Barber, F. H.	Lewellen	Finch Ditch	Irrig.	1.43	4	15	41	Keith	June	30	1895	964	
Clear creek	Barber, F. H. et al	Lewellen	Clear Creek Extension	Irrig.	1.14	31	16	41	Garden	July	5	1911		1111
Cold Water creek	Lisco Irr. Co.	Lisco	Cold Water Ditch	Irrig.	4.29	26	18	46	Deuel	Sept.	29	1894	796	
Coon creek	Winterer, Wm. H.	Keystone	Coon Creek Ditch	Irrig.	0.71	34	15	37	Keith	July	3	1895		69
Coon creek	Winterer, Wm. H.	Keystone	Coon Creek Ditch	Irrig.	1.42	34	15	37	Keith	Sept.	16	1912		1225
Crescent lake	Orr, George B., et al	Lewellen	Crescent Canal	Irrig.		20	20	44	Garden	Sept.	22	1910		1024*

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Dougout creek, S. W. Lower	Cooper, Eliza A.	Bridgeport	Cooper Ditch	Irrig.	0.86	4	19	48	Cheyenne	Aug.	15	1892	872	
S. W. Lower	Mulloy, Frank	Irving	Mulloy Ditch	Irrig.	1.	27	20	48	Cheyenne	July	18	1907		865
S. W. Lower	Hubbard, Henry	Broadwater	Hubbard Ditch	Irrig.	.20	4	19	48	Morrill	June	23	1910		995
Dugout creek	Hagerty, M. H.	Henry	Hagerty Ditch	Irrig.	1.	4	19	48	Morrill	Oct.	26	1912		1238
Eternal Springs	Nichols, Yorick	Broadwater	Dyer Ditch	Irrig.		34	24	58	Scotts Bluff	June	1	1914		1370*
Fremont creek	Eq Farm & S. Imp. Co.	N. Platte	Fremont Creek Ditch	Irrig.	9.29	15	13	30	Lincoln	Jan.	31	1894	686	
Golden creek	Thies, Perry J.	Ogalalla	Theis Ditch	Irrig.	2.71	25	15	39	Keith	Sept.	17	1895		160
Greenwood creek	Coulter, D. M. & H. M.	Lovel'd Col.	Coulter Ditch	Irrig.	4.	15	18	50	Cheyenne	Feb.	3	1896	830	
Greenwood creek	Trinnier, J. E.	Redington	Trinnier Canal	Irrig.	6.29	28	18	50	Cheyenne	April	6	1892	849	
Greenwood creek	Nelson, C. C. Trinnier, J. E	Redington	Nelson Canal	Irrig.	3.	33	18	50	Cheyenne	April	1	1892	845	
Greenwood creek	Capron, A. M., Lamb, J.	Redington	Capron & Lamb Ditch	Irrig.	2.	15	18	50	Cheyenne	Jan.	1	1893	896	
Greenwood creek	Dean, H. T.	Bridgeport	Meglemre Ditch	Irrig.	.29	10	18	50	Cheyenne	May	6	1896		294
Greenwood creek	Dean, H. T.	Bridgeport	Dean Ditch	Irrig.	8.83	10	18	50	Cheyenne	Dec.	5	1906		844
Greenwood creek	Meglemre, Sarah A.	Longm't Col.	Meglemre Ext	Irrig.	1.50	10	18	50	Cheyenne	March	11	1907		853
Greenwood creek	North, Robson Dean Co.	Bridgeport		Irrig.		10	18	50	Morrill	Dec.	14	1910		1045*
Horse creek	Mihan, John	Caldwell	State Line Ditch	Irrig.	3.07	33	23	58	Scotts Bluff	Sept.	10	1897		407
Horse creek	Brazel, P., Marsh, G.	Caldwell	Marsh & Braziel Canal	Irrig.	7.19	4	22	60	Wyoming	Nov.	24	1908		921
Horse creek	Gilmore, F. D.	Caldwell	Gilmore Ditch	Irrig.	9.	31	23	58	Scottsbluff	Feb.	21	1910		983
Horse creek	Mihan, John	Caldwell	State Line Ditch	Irrig.	2.	33	23	58	Scotts Bluff	April	21	1910		994
Horse creek	Jackson, Joel	Henry	Jackson Extension	Irrig.	1.	27	23	58	Scotts Bluff	May	19	1910		1000

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Address Post-Office	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate S	T	R	County	Date of Priority Month	D	Yr.	Docket No	App. No.
Horse creek	Foster, C. B. et al	Caldwell	Caldwell Ditch	Irrig.		3	22	60	Wyoming	Mar.	28	1911		1078*
Horse creek	Marsh-Braziel Canal Ex.	Caldwell	Marsh-Braziel Canal Ex.	Irrig.		4	22	60	Wyoming	Sept.	18	1911		1126*
Horse & Owl cks.	Pizer, H. J.	Mitchell	Horse Creek Ditch	Irrig.	0.83	31	25	58	Scotts Bluff	Feb.	29	1904		742
Huntington spg.	Cord, Fred	Hull	Cord Ditch	Irrig.	1.43	9	20	58	Scotts Bluff	Dec.	23	1904		778
Kiowa creek	Currie, Edwin A.	Mitchell	Currie Ditch	Irrig.	9.14	13	21	57	Scotts Bluff	March	23	1892	938	
Kiowa creek	Kellums, J. H.	Caldwell	Kellums Ditch	Irrig.	2.43	11	22	58	Scotts Bluff	Oct.	18	1901		611
Kiowa creek	Lowry, Ellis	Mitchell	Lowry Canal	Irrig.	0.52	31	32	57	Scotts Bluff	March	25	1904		746
Kiowa creek	Kellums, J. H.	Caldwell	Kellums No. 2	Irrig.	0.06	1	22	58	Scotts Bluff	Nov.	2	1907		880
Lawrence fork	Lindburg, Fred R.	Bridgeport		Irrig.	0.50	28	18	52	Cheyenne	Dec.	31	1886	825	
Lawrence fork	Gilman, Byron, Crigler, E. S.	Redington	Redington Ditch	Irrig.	0.57	36	19	52	Cheyenne	Oct.	9	1889	820	
Lawrence fork	Lindberg, Fred R.	Bridgeport	E. S. Crigler Ditch	Irrig.	.57	1	18	52	Cheyenne	Sept.	11	1891	861	
Lawrence fork	Harper, John W.	Sidney	Spring Branch Ditch	Irrig.	1.	11	18	52	Cheyenne	Oct.	23	1891	862	
Lawrence fork	Redington, H. V.	Redington	Redington Ditch	Irrig.	0.50	11	18	52	Cheyenne	May	1	1893	893	
Lawrence fork	King, W. O.	Kearney	Doran Canal	Irrig.	1.14	15	18	52	Cheyenne	June	1	1894	850	
Lawrence fork	Harper, John W.	Sidney	Spring Branch Extension	Irrig.	0.57	1	18	52	Cheyenne	Oct.	13	1898		476
Lawrence fork	Lindberg, Fred	Bridgeport	Crigler Extension	Irrig.	1.43	1	18	52	Cheyenne	Nov.	25	1898		486
Lawrence fork	Niehus, Henry	Redington	Niehus Ditch	Irrig.	0.86	11	18	52	Cheyenne	March	23	1900		550
Lawrence fork	Harper, J. W.	Sidney	Harper Ditch	Irrig.	1.43	11	18	52	Cheyenne	May	27	1902		669
Lawrence fork	Harper, John W.	Sidney	Bicket Ditch	Irrig.	0.57	11	18	52	Cheyenne	May	27	1902		670
Lawrence fork	Randall Bros.	Redington	Randall Bros Ditch	Irrig.	2.40	21	18	52	Cheyenne	May	15	1911		1100
Lonergan creek	Soehl, Herman A.	Lemoyne	Soehl Canal	Irrig.	2.	17	15	39	Keith	May	10	1889	697a	
Lonergan creek	Jacobs, Lee	Ogalalla	C. Lonergan Ditch	Irrig.	9.14	17	15	39	Keith	May	25	1889	699	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Source	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lonergan creek	Soehl, Herman A.	Lemoyne	Soehl Canal	Irrig.	0.83	17	15	39	Keith	April	27	1893	697b	.....
Lonergan creek	Stansberry, Elvina	Lemoyne	Haney Ditch	Irrig.	1.14	17	15	39	Keith	July	1	1893	719	.....
Mathews creek	Mathews, Benj. G	Keystone	Mathews Canal	Irrig.	1.14	23	15	37	Keith	April	1	1895	750	.....
Nine Mile Canon	Flower, L. F	Minatare	Side Hill Irr. Canal	Irrig.		34	22	53	Scotts Bluff	Jan.	31	1911	.....	1164*
North Platte R.	Platte Valley Irr. Co	N. Platte	North Platte Canal	Irrig.	300.	13	14	34	Lincoln	May	31	1884	635	.....
North Platte R.	Farmers Irr. Dist	Scottsbluff	Farmers' Canal	Irrig.	1142.86	3	23	58	Scotts Bluff	Sept.	16	1887	918	.....
North Platte R.	Minatare Mut. C. & I. Co.	Minatare	Minatare Ditch	Irrig.	249.43	32	22	54	Scotts Bluff	Jan.	14	1888	919	.....
North Platte R.	Winters Creek Irr. Co	Gering	Winter Creek Canal	Irrig.	124.29	17	22	55	Scotts Bluff	Oct.	18	1888	952	.....
North Platte R.	Enterprise Ditch Co	Scottsbluff	Enterprise Ditch	Irrig.	173.71	27	23	57	Scotts Bluff	March	28	1889	920	.....
North Platte R.	Castle Rock Irr. Canal & Water Power Co.	McGrew	Castle Rock Irr. Canal	Irrig.	82.57	4	21	54	Scotts Bluff	April	18	1889	921	.....
North Platte Riv.	Logan, Chas E.	Bridgeport		Irrig.	5.71	19	20	50	Cheyenne	Oct.	17	1889	821	.....
North Platte Riv.	Belmont, I. C. & W. P. Co.	Omaha	Belmont Canal	Irrig.	270.	18	20	51	Cheyenne	Dec.	19	1889	828 832	.....
North Platte Riv.	Central I.C.& W.P.Co.	Gering	Central I. C. & W. P. Co. Canal	Irrig.	36.	27	22	55	Scotts Bluff	June	23	1890	926	.....
North Platte Riv.	Myers, T. A. et al	Ogalalla	Myers & Phelps Canal	Irrig.	7.14	34	15	39	Keith	Sept.	11	1890	709	.....
North Platte Riv.	Sheridan, J. Wake	Ogalalla	Sheridan & Wilson Ditch	Irrig.	10.	20	14	35	Keith	Oct.	9	1890	710	.....
North Platte Riv.	Chimney Rock Irr. Can. & Water Power Co.	Bayard	Chimney Rock Canal	Irrig.	60.	1	20	53	Cheyenne	Dec.	3	1890	844	.....
North Platte Riv	Chimney Rock C. & W. P. Co	Bayard	Chimney Rock Canal	Irrig.	0.(	1	20	53	Morrill	Dec.	3	1890	1031	.....
North Platte Riv.	Empire Canal Co.	Bridgeport	Empire Canal	Irrig.	28.57	18	20	51	Cheyenne	June	25	1891	853	.....
North Platte Riv.	Kah, David	Minatare	Kah Ditch	Irrig.	4.57	11	21	54	Scotts Bluff	Nov.	1	1891	944	.....

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Source	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
North Platte Riv.	Brown's Cr. I. C. Co.	Bridgeport	Brown's Ck Canal	Irrig.	188.71	29	20	50	Cheyenne	Jan.	20	1892	857	
North Platte Riv.	Brown's Cr. Irr. C. Co.	Bridgeport	Brown's Cr. Irr. Canal	Irrig.	0.0	20	20	50	Morrill	Jan.	20	1892	1033*	
North Platte Riv.	Hale, Will A.	Gering	Homestead Ditch	Irrig.	11.43	21	22	55	Scotts Bluff	June	29	1892	941	
North Platte Riv.	Alliance I. C. & W. P. Co.	Bridgeport	Alliance Canal	Irrig.	100.	5	20	52	Cheyenne	Dec.	26	1892	874	
North Platte Riv.	Clark, Henry T.	Bridgeport	H. T. Clarke Canal	Irrig.	9.43	22	20	51	Cheyenne	Feb.	2	1893	875	
North Platte Riv.	Nichols, Yorrick and C.	Morrill	Ramshorn Ditch	Irrig.	45.71	13	23	58	Scotts Bluff	March	20	1893	945	
North Platte Riv.	Short Line Irr. Co.	Bayard	Short Line Canal	Irrig.	65.57	25	21	53	Scotts Bluff	May	1	1893	946	
North Platte Riv.	Lisco, Reuben	Lisco	Lisco Ditch	Irrig.	32.86	14	18	47	Cheyenne	July	1	1893	856	
North Platte Riv.	Nine Mile C. & Res. Co.	Bayard	Nine Mile Canal	Irrig.	200.	18	21	53	Scotts Bluff	Dec.	6	1893	925	
North Platte Riv.	Cody & Dillon I. C. Co.	N. Platte	Cody & Dillon I. C. Co.	Irrig.	127.	9	14	31	Lincoln	Dec.	29	1893	649	
North Platte Riv.	Keith & Lincoln Co. Irr. Dist.	Sutherland	S. & P. L. & I. C.	Irrig.	186.	18	14	36	Keith	Feb.	2	1894	722	
North Platte Riv.	Paxton & Hershey Water Co.	Hershey	Paxton & Hershey C.	Irrig.	130.	18	14	33	Lincoln	Feb.	12	1894	653	
North Platte Riv.	Lisco Irr. Co.	Lisco	Bower Ditch	Irrig.	21.37	6	17	45	Deuel	March	27	1894	787	
North Platte Riv.	Suburban Irr. Dist.	N. Platte	Farm. & Mer. Canal	Irrig.	183.	12	14	33	Lincoln	May	22	1894	662	
North Platte Riv.	South Side I. &. L. Co.	N. Platte	So. Side I. & L. Co. C.	Irrig.	270.	14	14	34	Lincoln	June	6	1894	667	
North Platte Riv.	Western Land & Cattle Co.	Omaha	Midland Ditch	Irrig.	12.	2	16	44	Deuel	June	9	1894	789	
North Platte Riv.	Keith, Morrell C.	N. Platte	Keith Canal	Irrig.	71.	36	14	30	Lincoln	July	7	1894	657	
North Platte Riv.	Maycock, Joseph	Morrill	Rooster Ditch	Irrig.	5.71	10	23	58	Scotts Bluff	July	29	1894	950	
North Platte Riv.	Smith, Augustus	N. Platte	Smith Canal	Irrig.	20.	36	14	30	Lincoln	Aug.	9	1894	676	
North Platte Riv.	Western Land & Cattle Co.	Omaha	Overland I. C. Can.	Irrig.	20.	1	16	44	Deuel	Aug.	14	1894	791	
North Platte Riv.	Hannah Irr. Can. Co.	Lisco	Hannah I. Canal	Irrig.	5.71	24	18	47	Cheyenne	Sept.	24	1894	886	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
North Platte Riv.	Gumaer, H. G., et al	Oshkosh	Oshkosh Canal	Irrig.	40.	33	17	44	Deuel	Oct.	5	1894	797	.....
North Platte Riv.	Smith, A. H., et al	Bridgeport	Beerline Canal	Irrig.	30.	24	19	49	Cheyenne	Oct.	13	1894	887	.....
North Platte Riv.	Spohn, Wm.	Oshkosh	Spohn Ditch	Irrig.	13.14	13	17	45	Deuel	Dec.	6	1894	801	.....
North Platte Riv.	Rush Creek Ir. Can. Co.	Lisco	Rush Creek Irr. Canal	Irrig.	9.64	2	17	46	Deuel	Dec.	11	1894	802	.....
North Platte Riv.	Lyons I. C. & W. P. Co.	Oshkosh	Lyons Irr. Canal	Irrig.	42.14	30	17	44	Deuel	Dec.	22	1894	803	.....
North Platte Riv.	Orr, Geo. B., et al	Lewellen	Orr & Vance Canal	Irrig.	2.93	29	16	42	Deuel	Dec.	24	1894	811	.....
North Platte Riv.	Williams, E. C. et al	Lewellen	Robb's & Williams Canal	Irrig.	26.57	35	16	42	Deuel	Jan.	4	1895	804	.....
North Platte Riv.	Gyger, J. C.	Oshkosh	Gyger Ditch	Irrig.	10.86	10	16	44	Deuel	Jan.	5	1895	806	.....
North Platte Riv.	Dikeman, S. F.	N. Platte	Dikeman Canal	Irrig.	30.	9	14	32	Lincoln	Jan.	14	1895	684	.....
North Platte Riv.	Simpson, Geo. M. et al	Oshkosh	Signal Bluff Ditch	Irrig.	30.13	16	16	43	Deuel	Jan.	16	1895	807	.....
North Platte Riv.	Jacobs, Lee	Ogalalla	Hay Land Canal	Irrig.	5.71	20	15	39	Keith	Jan.	19	1895	732	.....
North Platte Riv.	Hubartt, E.	N. Platte	Hubbartt & Hall D.	Irrig.	65.70	20	14	30	Lincoln	March	3	1895	691	.....
North Platte Riv.	Thies, Perry J.	Ogalalla	Fernstrom & Nissen	Irrig.	4.	25	15	39	Keith	March	23	1895	737	.....
North Platte Riv.	Alfalfa Irr District	Ogalalla	Alfalfa Irr. Dis. Can.	Irrig.	100.	1	15	42	Keith	March	25	1895	738	.....
North Platte Riv.	Bushnell, H. J. & E. N.	Oshkosh	Bushnell Bros. Ditch	Irrig.	7.14	12	16	44	Deuel	March	27	1895	809	.....
North Platte Riv	Alliance Irr. C. & W. P. Co	Bayard	Alliance Irr. C. & W. P. Co	Irrig.	.....	5	20	52	Morrill				1035*	.....
North Platte Riv.	Peterson, E. J.	Lemoyne	Holcomb Ditch	Irrig.	15.49	16	15	40	Keith	June	4	1895	.....	1
North Platte Riv	Steamboat Ditch Co.	Gering	Steamboat Ditch	Irrig.	15.	4	21	54	Scotts Bluff	Oct.	22	1895	.....	186
North Platte Riv.	Lisco Irr. Co.	Lisco	North River Irr. Canal	Irrig.	168.29	14	18	47	Cheyenne	Feb.	24	1896	.....	243
North Platte Riv.	Rush Cr. L. & L. Stk. C.	Lisco	LaMore Ditch	Irrig.	20.	34	19	48	Cheyenne	July	18	1896	.....	327
North Platte Riv.	Steamboat Ditch Co.	Gering	Steamboat Ditch	Irrig.	.....	4	21	54	Scotts Bluff	July	22	1896	.....	350*
North Platte Riv.	Tetreault, Amedee	Bridgeport	Tetreault Ditch No. 2	Irrig.	3.43	1	19	50	Cheyenne	Aug.	15	1896	.....	353
North Platte Riv.	The Gering Irr. District	Gering	Gering Canal	Irrig.	208.62	4	23	53	Scotts Bluff	March	15	1897	.....	365
North Platte Riv.	Schermerhorn, A. D.	Omaha	Schermerhorn Canal	Irrig.	29.71	16	20	51	Cheyenne	Oct.	25	1897	.....	418
North Platte Riv.	Frank, Wm.	Grand Island	Columbia Canal	Irrig.	600.	3	23	58	Scotts Bluff	April	14	1902	.....	660

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
North Platte Riv.	Secretary of Interior	Wash., D. C.	Pathfinder	Irrig.		19	29	83	State of Wyoming	Sept.	19	1904		768
North Platte Riv.	Belmont I. C. &. W. P. Co.	Bridgeport	Belmont Canal	Irrig.	115.71	18	20	51	Cheyenne	March	28	1907		902
North Platte Riv.	White, D. W.	Bridgeport	Empire Ext	Irrig.	1.	18	20	51	Cheyenne	July	20	1907		866
North Platte Riv.	Lisco, Reuben	Lisco	Lisco Ditch	Irrig.	3.	14	18	47	Garden	April	6	1910		991
North Platte Riv.	Halligan, J. J	North Platte	Round House Rock Canal	Irrig.		4	21	54	Scotts Bluff	April	13	1910		*992
North Platte Riv.	French, John E	Henry	French Ditch	Irrig.	11.	9	23	60	Wyoming	Dec.	21	1911		1149
North Platte Riv.	Liebhardt Bros	Denver, Colo.	Liebhardt Lateral	Irrig.	2.92	4	21	54	Morrill	Feb.	1	1912		1165
North Platte Riv.	Dobson, W. A	Northport	Dobson's Lateral	Irrig.	3.14	5	20	52	Morrill	Feb.	28	1912		1181
Spring Creek trb to N. Platte	Union Pacific Ry	Omaha	Frazier Lake	Ice	4.	35	14	30	Lincoln	Sept.	6	1907		868
Spring Creek trb to N. Platte	Keystone Irr. Co	Keystone	Spring Creek No. 1	Irrig.	1.13	19	15	37	Keith	May	27	1910		1002
Spring Creek trb to N. Platte	Gatch, Chas. E	Melbeta	Gatch Ditch	Irrig.	.93	25	21	54	Scotts Bluff	Aug.	21	1912		1220
Borrow Pit, trib. to N. Platte	Taylor, A. O.	Minatare	Borrow Pit Ditch	Irrig.	.29	19	21	52	Scotts Bluff	April	23	1904		751
Otter creek	Fairchild, Lewis F.	Lemoyne	Cascade Ditch	Irrig.	3.30	4	15	40	Keith	Apr.	1	1891	1032*	
Otter creek	Howell, R. B.	Omaha	Cascade Canal	Irrig.	20.	5	15	40	Keith	Mar.	17	1911		1073
Otter creek	Nissen, Pete & Co.	Belmar	Otter Canal	Irrig.	11.	5	15	40	Keith	May	24	1912		1198
Otter creek	Peterson, E. J.	Lemoyne	Peterson Ditch	Irrig.	1.32	5	15	40	Keith	Nov.	6	1912		1240
Owl creek	Kellums, John H.	Caldwell	Sunflower Ditch	Irrig.	.79	12	22	58	Scotts Bluff	Sept.	17	1897		411
Owl creek	Kellums, John H.	Caldwell	Sunflower Ditch	Irrig.	1.14	12	22	58	Scotts Bluff	Oct.	19	1904		770

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Owl creek	Kellums, John H.	Caldwell	Sunflower Ditch No. 2	Irrig.	1.14	12	22	58	Scotts Bluff	Nov.	29	1907		879
Owl creek	Kellums, John H.	Caldwell	Sunflower Ditch Ext.No.1	Irrig.	0.57	12	22	58	Scotts Bluff	Nov.	29	1907		881
Pawnee creek	Holcombe, M. N.	Brady Island	Holcombe's Ditch	Irrig.	8.	13	13	28	Lincoln	Oct.	18	1890	636	
Pawnee creek	Murphy, E. D.	Brady Island	Murphy's Ditch	Irrig.	8.57	29	13	27	Lincoln	June	9	1894	669	
Pawnee creek	Plumer, Wm. H.	Maxwell	Plumer Ditch	Irrig.	10.	19	13	27	Lincoln	June	15	1894	672	
Pawnee creek	Janssen, H.	Gothenburg	Janssen's Canal	Irrig.		20	13	27	Lincoln	April	8	1914		1395*
Platte river	Kearney W. & Elec. Pow. Co.	Kearney	Kearney W. & Elec. Pow. Co	L.&P	125.	3	8	16	Buffalo	Sept.	1	1886	1023	
Platte river	Gothenburg L. & P. Co.	Gothenburg	Gothenburg P. & I. C	L.&P	200.	29	12	26	Lincoln	July	5	1890	645a	
Platte river	Farmers' D. & C. Co.	Brady Island	Farm. D. & C. Co. D	Irrig.	280.	17	13	29	Lincoln	June	2	1894	666	
Platte river	Farmers' Irr. Co.	Lexington	Farmers Irr. Co's. D.	Irrig.	114.	25	10	23	Dawson	June	14	1894	621	
Platte river	Dawson County Irr. Co.	Lexington	Farmers & Merchants C.	Irrig.	1142.86	18	10	23	Dawson	June	26	1894	622	
Platte river	Fowells, Russell H.	Maxwell	Maxwell Canal	Irrig.	27.14	29	13	28	Lincoln	July	5	1894	673	
Platte river	Appleford Henry M	Maxwell	Appleford Canal	Irrig.	10.	15	13	29	Lincoln	July	7	1894	674	
Platte river	Sides, Leroy	Lowell	Leroy Sides' Ditch	Irrig.	20.	13	8	14	Kearney	July	23	1894	629	
Platte river	Farmers' Union D. Co.	Kearney	Farmers' Union Canal	Irrig.	128.57	6	8	19	Dawson	Aug.	10	1894	623	
Platte river	Platte R. Irr. Co	Lexington	Platte R. I. Co. Canal	Irrig.	400.	13	9	22	Dawson	Sept.	15	1894	624	
Platte river	Gothenburg L. & P. Co.	Gothenburg	Gothenburg P. & I. C	Irrig.	240.	29	12	26	Lincoln	Sept.	22	1894	645b	
Platte river	Farmers' Mut. Irr. Co.	Kearney	Farmers' Canal	Irrig.	180.	12	8	16	Buffalo	Sept.	24	1894	234 235 628	
Platte river	McCullough, John	Maxwell	McCullough Ditch	Irrig.	30.	35	13	28	Lincoln	Oct.	20	1894	679	
Platte river	Six Mile Ditch Co.	Gothenburg	Six Mile Ditch	Irrig.	40.	11	11	26	Lincoln	Oct.	22	1894	680	
Platte river	Gothenburg South Side Irr. Co.	Gothenburg	Gothenburg S. S. Irr. Co.	Irrig.	357.14	30	12	26	Lincoln	Oct.	26	1894	681	
Platte river	Booker, H. C.	Gothenburg	Booker Canal	Irrig.	100.	16	11	25	Dawson	Nov.	9	1894	625	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Platte river	Cozad Irr. Co.	Cozad	Cozad Irr. Canal	Irrig.	614.29	15	11	25	Dawson	Dec.	28	1894	626	
Platte river	Orchard & Alfalfa Irr.Co.	Cozad	Orchard & Al. Irr. D.	Irrig.	300.	9	10	24	Dawson	Jan.	23	1895	627	
Platte river	Lincoln & Dawson County Irr. Dist.	Gothenburg	Lincoln & Dawson Co. Irr. Dist Canal	Irrig.	642.86	9	13	29	Lincoln	Feb.	22	1895	637	
Platte river	Appleford, Henry M.	Maxwell	Appleford Canal	Irrig.	2.86	15	13	29	Lincoln	March	25	1895	650	
Platte river	Lex. So. Side Irr. Co.	Lexington	Lex. So Side Ditch	Irrig.	58.	8	9	22	Dawson	Sept.	28	1900		576
Platte river	Zook, Joseph	Cozad	So. Side Irr. Co	Irrig.		9	10	24	Dawson	Oct.	21	1913		1328
Plum Creek	Eggers, Thos	Lewellen	Plum Cr. D. & Res	Irrig.	1.14	23	16	42	Garden	Jan.	12	1914		1344
Pumpkin Seed	Wright, John S.	Harrisburg	Wright Ditch No. 1	Irrig.	2.	5	19	54	Banner	Dec.	31	1882	904	
Pumpkin Seed	Kelly, Wm. J.	Harrisburg	Kelly Ditch	Irrig.	1.43	5	19	54	Banner	May	10	1886	915	
Pumpkin Seed	Heard, Henry L.	Freeport	Heard's D's Nos. 1 & 2	Irrig.	1.29	14	19	54	Banner	June	1	1887	916	
Pumpkin Seed	Wright, John S.	Harrisburg	Wright Ditch No. 2	Irrig.	2.86	5	19	54	Banner	Dec.	31	1887	905	
Pumpkin Seed	Logan, John E.	Gering	Logan Ditch	Irrig.	4.	7	19	55	Banner	July	16	1890	902	
Pumpkin Seed	Court House Rock I. Co.	Bridgeport	Court House I. Canal	Irrig.	30.50	30	19	50	Cheyenne	Oct.	6	1890	840	
Pumpkin Seed	Smith, Eliza, C., Wheeler, Chas. G.	Sidney	Smith & Wheeler So. D.	Irrig.	1.57	26	19	51	Cheyenne	Oct.	16	1890	842	
Pumpkin Seed	Mutual Ditch Co.	Redington	Mutual Ditch	Irrig.	8.57	33	19	52	Cheyenne	Nov.	1	1890	843	
Pumpkin Seed	Waitman, P. P.	Redington	Waitman's Ditch	Irrig.	2.86	25	19	53	Banner	March	12	1891	847	
Pumpkin Seed	Endered, Chas. O., et al	Freeport	Endered Ditch	Irrig.	1.	21	19	53	Banner	May	27	1891	903	
Pumpkin Seed	Guthrie, W. A., Sweet, C. A.	Bridgeport	Meredith & Ammer Ditch	Irrig.	18.86	23	19	50	Cheyenne	Feb.	20	1893	876	
Pumpkin Seed	Hampton, R. R. and Wm. D.	Harrisburg	Hampton Ditch	Irrig.	1.29	25	20	57	Banner	April	5	1893	906	
Pumpkin Seed	Finn, J. L., Dean, H. T.	Bridgeport	Last Chance	Irrig.	8.	27	19	50	Cheyenne	April	12	1894	883	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet Granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Pumpkin Seed	Munn, Lee	Redington	Round House Rock D	Irrig.	3.	28	19	51	Cheyenne	May	29	1894	884	
Pumpkin Seed	Maxwell, Jos. J.	Redington	J. J. Maxwell Irr. Ditch	Irrig.	.50	23	19	52	Cheyenne	June	30	1894	885	
Pumpkin Seed	Dunlap, J.P.	Dwight	Dunlap Ditch	Irrig.	.36	24	19	54	Cheyenne	March	1	1895	889	
Pumpkin Seed	Willard, Wm. M.	Redington	Wm. M. Willard D.	Irrig.	1.43	25	19	51	Cheyenne	March	27	1895	888	
Pumpkin Seed	Thompson, R. S., et al	Redington	Birdcage Ditch	Irrig.	1.	19	19	51	Cheyenne	June	1	1895	892	
Pumpkin Seed	Smith, E. &. Wheeler,													
Pumpkin Seed	Chas. G.	Sidney	Smith & Wheeler North											
Pumpkin Seed			Ditch	Irrig.	.71	26	19	51	Cheyenne	June	1	1896	842	
Pumpkin Seed	Wisner, S. R., et al	Freeport	Abbott & Wisner Ditch	Irrig.		23	19	53	Banner				917	
Pumpkin Seed	Cluck, Millard	Harrisburg	Peters Ditch	Irrig.	2.57	34	20	56	Banner	July	1	1902	913	
Pumpkin Seed	Court House, Rock I. C.	Bridgeport	Court House Rock I.											
			Canal	Irrig.		30	19	50	Morrill				1028*	
Pumpkin Seed	Egleston, T. C.	Harrisburg	Airedale Canal No. 1	Irrig.	5.52	2	19	55	Banner	Jan.	24	1903	698	
Pumpkin Seed	Egleston, T. C.	Harrisburg	Airedale Canal No. 2	Irrig.	3.22	1	19	55	Banner	Jan.	24	1903	699	
Pumpkin Seed	Scott, Ambrose E.	Harrisburg	Reservoir Nos. 1, 2, 3,	Irrig.	1.31	7	19	55	Banner	June	24	1903	711	
Pumpkin Seed	Johnson, Theo.	Freeport		Irrig.	2.29	2	19	55	Banner	April	20	1906	819	
Pumpkin Seed	Beatty, D. E.	Harrisburg	Beatty Ditch	Irrig.	0.84	8	19	55	Banner	Sept.	1	1906	836	
Pumpkin Seed	Swanger, R.	Bridgeport	Swanger	Irrig.	0.43	29	19	50	Cheyenne	Feb.	28	1907	851	
Pumpkin Seed	Elter & Betebenner	Bridgeport	Pumpkin Creek Mills	P'wer	25.	23	19	50	Cheyenne	March	26	1907	855	
Pumpkin Seed	Pierson, A. H.	Harrisburg	Clearfield Canal	Irrig.	1.71	31	20	56	Banner	Jan.	23	1908	888	
Pumpkin Seed	Beatty, Daisy E.	Harrisburg	Beatty Canal	Irrig.	.19	5	19	55	Banner	June	2	1910	1004	
Pumpkin Seed	Seeley, W. J.	Dunlap, Iowa	Seeley Irr. Ditch	Irrig.	.57	28	19	52	Morrill	Jan.	19	1911	1052	
Pumpkin Seed	Egleston, T.C.	Harrisburg	Airedale Canal No. 2	Irrig.	1.57	1	19	55	Dawes	Oct.	26	1911	1133	
Pumpkin Seed	Egleston, T. C.	Harrisburg	Airedale Canal No. 1	Irrig.	.51	2	19	55	Banner	Sept.	4	1914	1380	
Sand creek	Holcomb, G. J., et al	Ogalalla	Holcomb & Smith	Irrig.	7.	10	15	40	Keith	May	20	1889	608	
Sand creek	Dudley, W. H.	Churdan, Ia.	Patrick Ditch	Irrig.	2.43	3	15	40	Keith	May	31	1891	725	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Sand creek	Nissen, Peter	Ogalalla	Nissen Ditch	Irrig.	3.07	10	15	40	Keith	March	18	1901		606
Sand creek	Maddox, P. P. Sillasen, S. J.	Keystone	Sand Creek Ditch	Irrig.	15.70	9	14	36	Keith	Jan.	3	1910		974
Seepage from lake	Huffman, M. J.	Gering	Huffman's Ditch	Irrig.	6.43	26	21	51	Scotts Bluff	March	19	1909		937
Seepage from lake	Enterprise Irr. D.	Scotts Bluff	Nelson Dr. Seep. D.	Irrig.		13	23	57	Scotts Bluff	**May**	21	1913		1200*
Schuetz Spring	Schuetz, Louis	Bridgeport	Schuetz Spring Canal	Irrig.	.21	28	18	50	Chevenne	May	10	1892	881	
Sheep creek	Nichols, Yorick	Henry	Little Moon	Irrig.	1.	10	24	58	Sioux	March	23	1904		745
Sheep creek	Covert, Pitt	Cheyenne, Wyoming	Nebraska Rerervoir	Irrig.	3.57	36	27	58	Sioux	May	18	1907		859
Sheep creek	West Fork Ditch Co.	Empire	West Fork Ditch	Irrig.	5.14	1	26	58	Sioux	Sept.	21	1907		871
Sheep creek	Cunningham, H. B.	Empire	Lower Canal	Irrig.	0.37	11	25	58	Sioux	Nov.	2	1907		875
Sheep creek	Speese, R. L.	Empire	Home Ranch Ditch	Irrig.	1.79	25	26	58	Sioux	Nov.	2	1907		876
Sheep creek	Speese, R. L.	Empire	Horse Pasture Reservoir	Irrig.	1.29	25	26	58	Sioux	Nov.	2	1907		877
Sheep creek	Speese, R. L.	Empire	Horse Camp Reservoir	Irrig.	2.86	36	27	58	Sioux	Jan.	20	1908		885
Sheep creek	Cunningham, H. B.	Empire	No. Two	Irrig.	2.50	2	25	58	Sioux	Feb.	24	1908		890
Sheep creek	Sheep Creek Lateral Co.	Morrill	Sheep Creek Lateral	Irrig.		17	23	57	Scotts Bluff	Feb.	26	1912		1176*
Sheep creek	Langholf, Ed. F.	Morrill	Langholf Ditch	Irrig.		1	25	58	Sioux	**July**	5	1913		1303*
Sheep creek	Vonberg, Peter	Morrill	Vonberg Ditch	Irrig.		8	23	57	Scotts Bluff	July	30	1913		1311*
Sheep creek	Perrine, E. Leon	Mitchell	Morrill Pow. Plt.	P'wer		8	23	57	Scotts Bluff	Nov.	29	1913		1337*
Draw, Trib to Sheep creek	Hovey, Ethel A.	Empire	Favorable	Irrig.	.27	19	26	57	Sioux	Oct.	25	1907		873
Draw, Trib to Sheep creek	Woodman, H. J.	Morrill	Gen. Utility Light & Pow. Plt.	P'wer	70.	17	23	57	Scotts Bluff	Aug.	17	1912		1217

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Skunk creek	Miller, Adam	Keystone	Miller Ditch	Irrig.	2.29	1	14	37	Keith	April	1	1895	740	
Skunk creek	Maddox, P. P.	Keystone	Skunk Creek Ditch	Irrig.	5.	6	14	36	Keith	Nov.	5	1909		968
Snake creek	Oasis Ditch Co.	Alliance	Oasis Ditch	Irrig.	54.86	6	24	51	Box Butte	June	6	1894	567	
Snake creek	Kilpatrick Bros. Co.	Beatrice	Elmore Canal	Irrig.	5.71	30	25	51	Box Butte	June	22	1895		41
Snake creek	Kilpatrick Bros. Co.	Beatrice	Kilpatrick Res. No. 1	Irrig.	200.	1	24	52	Box Butte	June	7	1911		1104
Snake creek	Kilpatrick Bros. Co.	Beatrice	Kilpatrick Res. No. 2	Irrig.	200.	6	24	51	Box Butte	Jan.	25	1912		1159
South Platte Riv.	Eaton, John J.	Brule	Eaton & McGrath Ditch	Irrig.	20.	25	13	41	Keith	April	3	1894	755	
South Platte Riv.	Hollingsworth, A.	Ogalalla	Hollingsworth Ditch	Irrig.	30.	12	13	39	Keith	June	5	1894	723	
South Platte Riv.	Stebbins, Lucien	N. Platte	Stebbins Canal	Irrig.	30.	34	14	32	Lincoln	Dec.	17	1894	683	
South Platte Riv.	Searle, E. M.	Ogalalla	Riverside Ditch	Irrig.	2.86	17	13	39	Keith	Dec.	22	1894	744	
South Platte Riv.	Miller, F. L.	Big Springs	Miller & Warren	Irrig.	53.86	7	12	42	Deuel	Jan.	5	1895	805	
South Platte Riv.	Ryan, J. T.	Brule	Home Irr. Ditch	Irrig.	3.14	30	13	40	Keith	March	2	1895	736	
South Platte Riv.	Shireman, W. H.	Ogalalla	So Side Plano Ditch	Irrig.	1.43	17	13	39	Keith	April	27	1895	733	
South Platte Riv.	Kimball, W., et al	Big Springs	Big Springs Canal	Irrig.	8.93	35	13	42	Deuel	April	27	1895	810	
South Platte Riv.	Stafford, David	Paxton	Paxton Southern Ditch	Irrig.	1.43	2	13	36	Keith	Oct.	17	1895		184
South Platte Riv.	Lute & Sheridan	Ogalalla	Lute & Sheridan Ditch	Irrig.	13.43	5	13	37	Keith	Feb.	17	1896		231
South Platte Riv.	Meyer, Henry	Brule	Meyer Canal	Irrig.	1.46	22	13	40	Keith	April	14	1896		283
South Platte Riv.	Carnahan, H., Reed, O.	Ogalalla	Cereal Irr. Ditch	Irrig.	4.86	16	13	39	Keith	July	10	1896		357
South Platte Riv.	Allen, Wm. F.	Omaha	Allen Ditch	Irrig.	6.58	24	13	40	Keith	Dec.	15	1896		370
South Platte Riv.	Western Irrig. District	Big Springs	Western Irrigation Dist.	Irrig.	180.00	14	12	43	Deuel	June	14	1897		393
South Platte Riv.	Kimball, Walter	Big Springs	Kimball's Und'rd'w	Irrig.	3.57	4	12	42	Deuel	Nov.	8	1898		482
Spotted Tail Ck.	Stewart, H. G.	Mitchell		Irrig.	1.	10	23	56	Scotts Bluff	May	2	1898		449
Spotted Tail Ck.	Stewart, H. G.	Mitchell	Stewart Res.	Irrig.	1.43	2	23	56	Scotts Bluff	March	2	1904		743
Spotted Tail creek	Brown, E. W.	Mitchell	Brown Ditch	Irrig.	2.28	2	23	56	Scotts Bluff	Mar.	17	1911		1072

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Spotted Tail creek	Tri-State Land Co	Scotts Bluff	Tri-State Land Co. Canal No. 2	Irrig.	10.	23	56	Scotts Bluff		Aug.	21	1911		1123*
Spotted Tail creek	Whitehead, Jas. T.	Mitchell	Whitehead Power Plant.	P'wer	10.	26	24	56	Sioux	Aug.	10	1912		1215
Spotted Tail creek	Roberts, Sam'l L.	Mitchell	Roberts Ditch	Irrig.		16	23	56	Scotts Bluff	Nov.	6	1912		1241*
Spring Branch	Brogan Bros.	Paxton	Brogan Bros. D.	Irrig.	.57	35	15	37	Keith	Sept	24	1897		410
Spring Br., trib. to Lawr. Fork	Harper. J. W.	Sidney	Harper Ditch No. 2	Irrig	2.	1	13	52	Cheyenne	June	16	1902		674
Spring creek	Peterson, E. J.	Ogalalla	Spring Creek Ditch	Irrig.	.57	12	15	40	Keith	June	18	1891	724	
Spring creek	Freiday, Florian F.	Lexington	Freiday Canal	Irrig.	1.	20	9	20	Dawson	Nov.	25	1910		1040
Spring Ck., trib. to White Tail	Keystone Irr. Co.	Keystone	Spring Creek Ditch	Irrig.	1.57	19	15	37	Keith	June	21	1890	701	
Spring Ck. Lit.	Keystone Irr. Co	Keystone	Little Spring Ditch	Irrig.	.57	29	15	37	Keith	April	1	1902		650
Spring Ck. Lit.	Shramek, Marie	Havelock	Shramek Canal	Irrig.	1.50	22	22	55	Scotts Bluff	June	9	1913		1295
Spring Ck. Lit.	Gilchrist, M. B.	Scotts Bluff		Irrig.	.14	22	22	55	Scotts Bluff	July	29	1913		1310
Springs, trib to Middle creek	Bartling, Henry	Redington	Bartling Ditch	Irrig.	.29	28	18	51	Cheyenne	July	31	1891	870	
Springs, trib. to Middle creek	Bartling, Henry	Redington	Bartling Ditch No. 2.	Irrig.	.29	28	18	51	Cheyenne	June	1	1894	891	
Sprs. on Sec. 28-18-49	Finn Brothers	Bridgeport	Finn Bros.' Ditch	Irrig.	.50	28	18	49	Cheyenne	July	1	1890	836	
Springs & Sloug	Cundall, Harry	Stratton	Cundall Ditch	Irrig.	.71	19	20	51	Morrill	Dec.	15	1911		1148

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Strm. (no name)	Newberry, H.	N. Platte	Newberry Ditch	Irrig.	1.14	22	14	32	Lincoln	Feb.	25	1895	688	
Willow creek	Everett, R. L.	Harrisburg	Willow Springs Ditch 1	Irrig.	.57	16	19	56	Banner	Jan.	21	1902		650
Willow creek	Everett, R. L.	Harrisburg	Willow Springs Ditch 2	Irrig.	.56	16	19	56	Banner	Jan.	21	1902		651
White Horse creek	Lamplough, Isaac	N. Platte	Lamplugh's Lakes	Irrig.	2.86	8	14	30	Lincoln	Dec.	31	1883	658	
White Horse creek	Bratt, Jno.	N. Platte	Jno. Bratt Ditch	Irrig.	6.	9	14	30	Lincoln	Aug.	25	1913		1316
White Tail creek	McCarthy, John M.	Keystone	McCarthy Ditch	Irrig.	1.	36	15	38	Keith	July	15	1890	749	
White Tail creek	Keystone Irr. Co.	Keystone	Halloway & Phelps Ditch	Irrig.	4.	36	15	38	Keith	June	1	1893	717	
White Tail creek	Leonard Brothers	Keystone	Little Dandy	Irrig.	2.	22	15	38	Keith	Oct.	12	1894	727	
White Tail creek	Keystone Irri. Co.	Keystone	Foster Keystone Canal	Irrig.	13.86	33	15	38	Keith	Oct.	30	1894	730	
White Tail creek	Reed, Fred	Keystone	Reed Ditch	Irrig.	.57	15	15	38	Keith	May	15	1895	751	
White Tail creek	McGinley, Geo.	Keystone		Irrig.	1.42	36	15	38	Keith	Oct.	29	1897		420
White Tail creek	Keystone Irri. Co.	Keystone	Keystone Canal	Irrig.	51.71	26	15	38	Keith	April	26	1902		662b
White Tail creek	Keystone Irri. Co.	Keystone	Keystone Ditch	Irrig.	4.30	26	15	38	Keith	Nov.	30	1906		843
White Tail creek	Keystone Irrig. Co.	Keystone	West Keystone	Irrig.	1.75	26	15	38	Keith	May	27	1910		1001
White Tail creek	Keystone Irr. Co.	Keystone	Keystone	Irrig.	9.86	27	15	38	Keith	May	27	1910		1003
Wind Springs	Lancomer, Geo. & Chas.	Gering	Wind Springs Canal	Irrig.	1.43	12	24	55	Sioux	March	1	1899	954	
Wind Springs	Smith, Jas. S.	Mitchell	Smith's Ditch	Irrig.	2.86	12	24	55	Sioux	March	14	1910		986
Winters creek	Bouton, Chas. A.	Gering	Bouton's Ditch	Irrig.	1.0	3	22	54	Scotts Bluff	Aug.	17	1890	923	
Winters creek	Shumway, G. L.	Scotts Bluff		P'wer		8	22	51	Scotts Bluff	Jan.	8	1911		1059
Wood river	Davis, J. H. & Sons	Gibbon		P'wer	40.	13		14	Buffalo	Nov.	1	1873	902	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-A—(Concluded)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Wood river	Shelton Mill & G. Co.	Shelton		P'wer	40.	1	9	13	Buffalo	Oct.	16	1873	994	
Wood river	Bears, S.	Kearney		P'wer	25.40	13	9	16	Buffalo	May	1	1881	995	
Wood river	Klein, J. J.	Kearney	White Bridge Park	Irrig.	.03	8	9	15	Buffalo	March	[illegible]	1900		545a
Wood river	Klein, J. J.	Kearney	White Bridge Park	P'wer	10.	8	9	15	Buffalo	Mar.	14	1900		545b
Wood river	Jacobson, C. A.	Riverdale	C. A. Jacobson Canal	Irrig.	0.5	31	10	16	Buffalo	Nov.	10	1910		1038
Wood river	Kimbrough, Cora	Shelton	Kimbrough Canal	Irrig.	4.	36	10	13	Buffalo	Sept.	21	1912		1227
Wood river	Quail, T. J.	Miller	Wood River	Irrig.	2.29	14	11	18	Buffalo	May	1	1913		1286

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-B-

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Arickaree river	Jenkins, Chas. T.	Haigler	Haigler Reservoir & Irr. Co.	Irrig.	171.	15	1s	42	State of Colo	Jan.	21	1910		974
Big Cottonwood	Hansberry, J. T.	Bloomington	Bloomington Ditch	Irrig.	.50	25	2	16	Franklin	Dec.	31	1881	185	
Big Cottonwood	Hansberry, J. T.	Bloomington	Bloomington Mill R.	P'wer		25	2	16	Franklin	Dec.	31	1881	185	
Big Cottonwood	Zulauf, Chas. E.	Ravenna	Bloomington Mill R.	Irrig.	.20	25	2	16	Franklin	Nov.	23	1898		483
Buffalo creek	Allen, N. J., Sr., et al	Haigler	Allen & Larned Ditch	Irrig.	6.	18	1	40	Dundy	Oct.	16	1890	117	
Buffalo creek	Porter, J. R. & Sons	Haigler	Porter & Sons' Ditch	Irrig.	2.86	1	1	41	Dundy	Nov.	26	1890	171	
Buffalo creek	Jenkins, Chas. T.	Haigler	Jenkins Land & Live Stock Co.'s Ditch No. 1	Irrig.	4.29	18	1	40	Dundy	Dec.	12	1908		924
Buffalo creek	Porter L. & Inv. Co.	Haigler	J. R. Porter	Irrig.	3.32	1	1	41	Dundy	June	28	1913		1206
Brush creek	Lofton, Frank S.	McCook	Brush Creek Reservoir	Stor.	3.5	3	2	29	Red Willow	June	1	1912		1201
Center creek	Gregory, A. B. & P. C.	Franklin	Gregory Ditch	Irrig.	4.	1	1	15	Franklin	Aug.	11	1894	182	
Center creek	Rose,, C. H.	Franklin	Rose Ditch	Irrig.	.29	36	2	15	Franklin	Jan.	10	1902		648
Coates creek	Burton, R. D.	Franklin		Irrig.	.37	33	2	14	Franklin	March	6	1899		501
Cook creek	Sharpnac, W. A.	Alma	Sharpnac Ditch	Irrig.	1.	4	1	18	Harlan	Feb.	21	1896		251
Crooked creek	Kaley, C. H.	Red Cloud	Fish Pond	Fish	1.	1	1	11	Webster	May	7	1902		665
Crooked creek	Slawson, E. R.	Red Cloud	Slawson Ice Pond	Stor.	.75	1	1	11	Webster	Aug.	8	1912		1213
Driftwook creek	Schmitz, J. A.	McCook	Schmitz Irr. Wks.	Irrig	1.50	12	2	30	Red Willow	May	3	1913		1287
Driftwook creek	Hesterwerth, Jno. H.	McCook	Hesterwerth Irr. Wks	Irrig.	1.	14	2	30	Red Willow	Nov.	17	1913		1332
Driftwook creek	Wasson, I. H. & Sons	McCook	Sylvan Dell	Irrig.		1	2	30	Red Willow	Dec.	6	1913		1340*
Driftwook creek	Fitch, W. S.	McCook	W. S. Fitch	Irrig.		36	3	30	Red Willow	July	2	1914		1372*

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-B—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Elk creek	Murray, Esther	Arapahoe	Murray Irr. Wks	Irrig.	2.85	11	4	23	Furnas	Aug.	13	1913		1315
Frenchman river	Athey, H. E	Wauneta	Wauneta Mills	P'wer	35.0	11	5	36	Chase	July	31	1886	178	
Frenchman river	Daschosifsky, G.	Lamar	Lamar Rolling Mill	P'wer	30.	18	6	40	Chase	Dec.	30	1887	1013	
Frenchman river	James, R. P.	Champion	Champion Mills	P'wer	28.3	21	6	39	Chase	Dec.	31	1887	179	
Frenchman River	McGillen, W. J	Imperial	Aberdeen Ditch	Irrig.	2.	1	5	38	Chase	July	1	1888	50	
Frenchman river	McGillen, W. J.	Imperial	Harlem Ditch	Irrig.	2.	1	5	38	Chase	July	1	1888	56	
Frenchman river and Stinking Water creek	Culbertson Irr. & Water Power Co.	Culbertson	Culbertson Irr. & Water Power Canal	Irrig.	215.	31	5	33	Hayes	May	16	1890	24 25 29 30	
Frenchman river	Kilpatrick Bros. Co.	Beatrice	Champion Water Power and Irr. Ditch	Irrig.	61.80	23	6	40	Chase	Dec.	23	1890	47	
Frenchman river	McGillen, W. J.	Imperial	Aberdeen Ditch	Irrig.	.50	3	5	38	Chase	Feb.	2	1891	50	
Frenchman river	Farmers Canal Co.	Culbertson	Farmers' Canal	Irrig.	10.	11	3	32	Hitchcock	Dec.	19	1893	10	
Frenchman river	Fuller, C. D.	Imperial	Fuller Ditch	Irrig.	25.	4	5	36	Chase	June	12	1893	62	
Frenchman river	River Side Canal & Irrigation Co.	Culbertson	Riverside Canal	Irrig.	12.	33	4	32	Hitchcock	July	28	1894	18	
Frenchman river	Dissmore, Geo. A.	Des Moines	Frenchman Val. Canal	Irrig.	10.	32	5	33	Hayes	Aug.	23	1894	38	
Frenchman river	Gould, Wilson S.	Omaha	Gould Ditch	Irrig.	2.	1	5	38	Chase	Oct.	9	1894	67	
Frenchman river	Grant, Allen	Imperial	Grant or Aberdeen Ditch	Irrig.	2.	3	5	38	Chase	Oct.	16	1894	68	
Frenchman river	Maranville, E., et al	Lamar	Maranville Ditch	Irrig.	6.	12	6	41	Chase	Dec.	8	1894	70 71	
Frenchman river	Wise, J. S.	Palisade	Wise Ditch	Irrig.	2.	15	5	35	Hayes	Dec.	28	1894	42	
Frenchman river	Emmerling, E. O.	Wauneta	N. Side Gurnsey Ditch	Irrig.	5.	3	5	37	Chase	Jan.	14	1895	74	
Frenchman river	Emmerling, E. O.	Wauneta	S. Side Gurnsey Ditch	Irrig.	24.	10	5	37	Chase	Jan.	14	1895	75	
Frenchman river	Inman, Norton	Champion	Inman Ditch	Irrig.	1.50	17	6	40	Chase	Feb.	28	1895	79	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-B-

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Frenchman river	Kilpatrick Bros. Co	Beatrice	North Side Irr. Ditch	Irrig	.7	21	6	39	Chase	Feb.	25	1896		246
Frenchman river	Shallenberger, P. H.	Imperial	Shallenberger Canal	Irrig.	1.77	25	6	39	Chase	Dec.	21	1897		423
Frenchman river	Inman Ditch & Irr. Co.	Imperial	Inman Ditch	Irrig.	6.43	17	6	40	Chase	Feb.	10	1898		436
Frenchman river	Hoke, J. A.	Champion	Creamery Ditch	P'wer	34.40	21	6	39	Chase	Dec.	12	1900		591
Frenchman river	Follett & Krotter	Palisade	Follett & Krotter Ditch	Irrig.	4.29	35	5	34	Hayes	April	30	1903		705
Frenchman river	Follett & Krotter	Palisade	Krotter Power Plant	P'wer	19.	35	5	34	Hayes	May	12	1903		708
Frenchman river	Dissmore, Geo A.	Des Moines	Goker Ditch Extension	Irrig.	20.	5	4	33	Hitchcock	July	6	1903		714
Frenchman river	Follett & Krotter	Palisade	Follett & Krotter	Irrig.	2.57	35	5	34	Hayes	Aug.	11	1903		720
Frenchman river	Follett & Krotter	Palisade	Krotter Power Plant	P'wer	12.	35	5	34	Hayes	April	5	1904		748
Frenchman creek	Hagerman, William	Hamlet		Irrig.	.86	19	5	34	Hayes	March	11	1909		935
Frenchman river	Krotter, F. C.	Palisade	Follett & Krotter Ditch	Irrig.	10.40	35	5	34	Hitchcock	Jan.	15	1910		975
Frenchman river	Krotter, F. C.	Palisade	Krotter Power Plant	P'wer	55.	35	5	34	Hitchcock	Aug.	17	1910		1021
Frenchman river	Krotter, F. C.	Palisade	Krotter Power Pl. No. 3	Irrig.	2.42	35	5	34	Hayes	Dec.	15	1910		1047
Frenchman river	Hoke, J. A.	Champion	Hoke's Power & Pump Plant	Irrig.	2.28	21	6	39	Chase	May	1	1911		1094
Frenchman river	Kilpatrick Bros.	Beatrice	Kilpatrick Res. No. 1	Stor.	60.	23	6	40	Chase	June	22	1911		1108
Frenchman river	Sheridan, R. B.	McCook	Ex. Aberdeen Canal	Irrig.	1.57	2	5	38	Chase	July	29	1911		1117
Frenchman river	Theobald & Athey	Wauneta	Wauneta M. & Elec. P. Plant	P'wer	75.	11	5	36	Chase	Nov.	16	1911		1136
Frenchman creek	Arterburn, E. E.	Lincoln	Arterburn Storage Res.	Irrig.	150.	11	6	41	Chase	Nov.	28	1911		1142
Frenchman river	Bishop, Stephen S.	Lincoln	Inman Storage Res.	Irrig.	125.	17	6	40	Chase	Dec.	8	1911		1145
Frenchman river	Oliver Bros.	Wauneta	Oliver Bros. Canal	P'wer	50.	7	5	35	Hayes	April	28	1913		1234
Frenchman river	Oliver Bros.	Wauneta	Oliver Bros. Canal	Irrig.	3.2	7	5	35	Hayes	April	28	1913		1235
Frenchman river	Frenchman Val. Irr. Dist	Culbertson	Harvey Res.	Stor.	300.	3	5	38	Chase	July	10	1913		1304
Frenchman river	Krotter, F. C.	Palisade	Krotter Pow. Plant	P'wer	65.	35	5	34	Hayes	Dec.	2	1913		1339
Frenchman river	Frenchman Val. Irr. Dist	Culbertson	Frenchman Val. Irr. D.	Irrig.		31	5	34	Hayes	April	6	1914		1364*

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-B—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Horse creek	Nesbit, J. M., et al	Parks	Horse Creek Ditch	Irrig.	1.86	23	1	39	Dundy	Aug.	31	1885	{159 {173	
Spring trib. to Horse creek	Pringle, Esther L.	Parks	Pringle Ditch	Irrig.	.37	11	1	39	Dundy	Jan.	12	1897		364
Spring trib. to Horse creek	Pringle, Geo. N.	Benkelman	Pringle Ditch	Irrig.	1.57	14	1	39	Dundy	May	11	1906		824
Indian creek	Chamberlain, J. C.	Mt. Sterling, Ill.	Chamberlain Ditch	I. & F	.06	28	2	36	Dundy	Oct.	4	1895		240
Indian creek	Thompson & Van Sickle	Benkelman	Thompson & Van Sickle	Irrig.	.93	8	2	37	Dundy	Feb.	14	1896		237
Indian creek	Kinsey, J. W., C. C.	Benkelman	Kinsey Ditch	Irrig.	.31	10	2	37	Dundy	March	7	1896		261
Indian creek	Wilson, Ed.	Stratton	Wilson Ditch	Irrig.	1.43	23	2	36	Dundy	March	17	1896		268
Indian creek	Stoneberg, Sanford	Max	Stoneberg Ditch	Irrig.	1.	2	2	37	Dundy	Mar.	13	1911		1070
Indian creek	Stoneberg, Sanford	Max	Stoneberg Ditch No. 2	Irrig.	1.	11	2	37	Dundy	June	23	1913		1299
Kilpatrick Res. No. 1	Kilpatrick Bros. Co.	Beatrice	Kilpatrick Res. Ditch	Irrig.	17.	30	6	39	Chase	Jan.	25	1912		1160
Medicine creek	Cambridge Milling Co.	Cambridge		P'wer	68.	29	4	25	Furnas	Dec.	31	1878	{92 {93	
Medicine creek	Sanders, John L.	Stockville	Sanders Irr. Plant	Irrig.	1.43	27	7	27	Frontier	Feb.	8	1895	83	
Medicine creek	Crete Mills	Crete	Curtis Lake	W S & P.		32	8	28	Frontier				*364	
Medicine creek	Maywood Milling Co.	Maywood	Maywood Milling Co.	P'wer	11.88	16	8	29	Frontier	May	4	1907		858
Methodist creek	Keester, Nora D.	Alma	Meadow Brook	Irrig.		2	1	18	Harlan	Nov.	11	1913		1331*
Mauer Springs	C. B. & Q. R. R.	Lincoln	Burlington Pipe Line	Irrig.	1.48	23	2	11	Chase	Nov.	28	1911		1143

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-B—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Red Willow creek	Moore, Wm. H.	Indianola	Red Willow Mill	P'wer		16	3	28	Red Willow	Jan.	1	1886	181	
Red Willow creek	Holland, L. J.	Indianola	L. J. Holland Ditch	Irrig.	35.	16	3	28	Red Willow	Jan.	23	1891	95	
Red Willow creek	Helm, John F.	Red Willow		Irrig.	2.	17	3	28	Red Willow	Feb.	18	1895	111	
Red Willow creek	Clark, A. R.	Indianola	Red Willow Val. Mound	Irrig.	14.29	31	4	28	Red Willow	Feb.	27	1905		781
Red Willow creek	Helm Irr. Ditch Co	McCook	Helm Ditch	Irrig.	10.	5	3	28	Red Willow	Dec.	5	1910		1042
Red Willow creek	Masters, Chas	Indianola	Master's Ditch	Irrig.	1.14	6	3	28	Red Willow	July	29	1912		1212
Red Willow Lake	Cooper, James	Wallace	Red Willow	Irrig.	2.	36	9	33	Lincoln	Dec.	20	1893	647	
Republican river	Gearhart & Benson	Arapahoe	Arapahoe Star Mill	P'wer	196.	27	4	23	Furnas	July	24	1879	1029	
Republican river	Carson, Andrew	McCook	Carson Ditch No. 1	Irrig.	1.43	27	3	30	Red Willow	July	1	1888	103	
Republican river	Pioneer Irr. Co	Haigler	Haigler L. & C. CO. D	Irrig.	77.	2	1	43	Dundy	Apr.	4	1890	1025	
Republican river	Brown, W. A.	Haigler	Sand Point Ditch Co.	Irrig.	11.	11	1	42	Dundy	Sept.	25	1890	115	
Republican river	Dundy Co. Irr. Co	Benkelman	Dundy Co. Ditch	Irrig.	45.	24	1	39	Dundy	Nov.	22	1890	118	
Republican river	Trites, W. H., et al	Culbertson	Trites-Davenport Canal	Irrig.	7.	20	3	31	Hitchcock	Dec.	18	1890	3	
Republican river	McCook I. &. W. P. Co.	McCook	Meeker Canal	Irrig.	143.	15	3	31	Hitchcock	Dec.	22	1890	{4, 9 {8, 7	
Republican river	Trenton Farmers' Irrigation Association	Trenton	Trenton Farmers' I. D.	Irrig.	32.	10	2	34	Hitchcock	Dec.	24	1890	5	
Republican river	Carson, Andrew	McCook	Carson Ditch No. 2.	Irrig.	18.	27	3	30	Red Willow	May	5	1891	102	
Republican river	Neighbors, E. G	Benkelman	Neighbors Ditch	Irrig.	2.86	24	1	39	Dundy	March	18	1891	133	
Republican river	Cambridge & Araphoe Irr. & Imp. Co.	Arapahoe	C. & A. I. & I. Co. D.	Irrig.	170.	28	4	25	Furnas	Aug.	26	1891	89	
Republican river	Republican River Irr. Co.	Benkelman	Republican Riv. I. Co. D	Irrig.	30.	29	1	38	Dundy	May	2	1892	{147 {148	
Republican river	Larned, W. H., et al	Haigler	White & Larned, D	Irrig.	3.	22	1	40	Dundy	April	29	1893	150	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-B—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Republican river	Marr, Lorenzo	Culberston	Marr Ditch	Irrig.	4.29	16	3	31	Hitchcock	Jan.	22	1894	11	
Republican river	Anderson, Anders	Benkelman	Anders Anderson Ditch	Irrig.	2.	1	1	37	Dundy	Jan.	26	1894	151	
Republican river	Groesbeck & Cannon	Max	Groesbeck Ditch	Irrig.	10.	10	1	37	Dundy	March	27	1894	153	
Republican river	Thomas, A. J.	Haigler	Thomas Ditch	Irrig.	2.	24	1	40	Dundy	June	5	1894	154	
Republican river	Ballard, Henry L.	Oxford	Ballard Ditch	Irrig.	8.	8	3	21	Furnas	June	9	1894	91	
Republican river	Wilcox, F. S.	McCook	Wilcox Ditch	Irrig.	4.50	32	3	29	Red Willow	Oct.	4	1894	109	
Republican river	Delaware-Hickman Ditch Co.	Benkelman	Delaware-Hickman Ditch	Irrig.	20.	17	1	37	Dundy	Jan.	7	1895	157	
Republican river	Allen, E. M., et al	Arapahoe	Allen Irr. Ditch	Irrig.	14.	2	3	26	Red Willow	Jan.	26	1895	110	
Republican river	Spooner, J. A.	Parks	Private Ditch	Irrig.	1.	25	1	40	Dundy	Oct.	7	1897		413
Republican river	Lee, Wm.	McCook	Harmon Ice Pond Ditch	Ice	10.	32	3	29	Red Willow	Jan.	22	1900		535
Republican river	Walsh, Patrick	McCook	Walsh Canal	Irrig.	11.	35	3	30	Red Willow	Jan.	31	1900		537
Republican river	Rep. Riv. Irr. Co.	Benkelman	Rep. River Irr. Canal	Irrig.	20.	29	1	38	Dundy	Aug.	22	1900		577
Republican river	Eller, T. A. et al	Trenton	Campbell Canal	Irrig.	9.14	9	2	34	Hitchcock	July	13	1906		828
Republican river	Dickson, W. H.													
	Holmes, H. R.	Denver	Haigler Res. No. 2	Irrig.	24.	27	1	41	Dundy	April	29	1910		997
Republican River	Rogers, W. N.	McCook	Shadeland Park Ditch	I. & P	38.	26	3	29	Red Willow	Jan.	3	1911		1049
Republican river	McConnell Bros.	Trenton	McConnell Bros. Irr. Co.	Irrig.	180.	10	2	34	Hitchcock	Jan.	23	1911		1055
Republican river	Hurst, J. C. et al	Trenton	H. D. Irr. Canal	Irrig.	7.	28	2	35	Hitchcock	March	2	1911		1068
Republican river	Cappel, Geo.	McCook	Geo. Cappell Ditch	Irrig.	1.57	19	3	30	Red Willow	May	1	1911		1093
Republican river	Rogers, W. M.	McCook	Shadeland Park Ditch	Irrig.	7.	25	3	29	Red Willow	Sept.	2	1911		1129
Republican river	Anderson, C. et al	Benkelman	Cottonwood Ditch	Irrig.	3.35	6	1	36	Dundy	Feb.	19	1912		1172
Republican river	Rupert Ditch Co.	Culbertson	Rupert Ditch	Irrig.	20.	32	3	32	Red Willow	April	19	1912		1192
Republican river	Pringle, Geo. N.	Parks	Parks Ditch	Irrig.	17.	20	1	39	Dundy	June	18	1912		1202
Republican river	Rep. Riv. Pow. Co.	Omaha		P'wer	300.	15	1	9	Webster	Aug.	26	1912		1221
Repub. riv. S. Fk.	Guthrie & Co.	Superior	Guthrie & Co.	P'wer	400.	34	1	7	Nuckolls	Sept.	1	1877	1036*	
Repub. riv. S. Fk	Karr, J. W.	Benkelman	Karr's Ditch	Irrig.	2.	20	1	37	Dundy	July	28	1894	155	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-B—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Repub. riv. S. Fk	Riverside Ditch Co	Benkelman	Riverside Ditch	Irrig.	13.	29	1	37	Dundy	Aug.	5	1894	156	.....
Repub. riv. S. Fk	McDonald, J. A.	Benkelman	McDonald Ditch	Irrig.	.79	36	1	38	Dundy	Nov.	13	1901	.....	644
Repub. riv. S. Fk	Askey, B. R.	Oxford	Askey Irr. Ditch	Irrig.	.....	5	3	21	Furnas	Aug.	26	1913	.....	1317*
Repub. riv. S. Fk	Bailey, W. J.	Oxford	W. J. Bailey	Irrig.	.64	6	3	21	Furnas	Sept.	8	1913	.....	1321
Rock creek	Highland, E. F., et al	Denver, Colo.	Phelan Ditch	Irrig.	4.29	17	1	39	Dundy	Dec.	31	1883	138	.....
Rock creek	Owens, J. S., et al	Parks	Owens' Ditch	Irrig.	.36	31	2	39	Dundy	March	14	1896	.....	265
Rock creek	Campbell, R. R.	Parks	Rock Creek Ditch Co	Irrig.	.33	13	2	40	Dundy	Dec.	18	1899	.....	526
Rock creek	Benkelman L. Asso	Benkelman	Benkelman Light Asso	P'wer	20.	8	1	39	Dundy	Nov.	30	1912	.....	1245
Sappa creek	Zulauf, Geo. W.	Stamford	Stamford Mills	P'wer	.....	21	2	20	Harlan	.....	.....	.....	*997	.....
Seep water	Anderson, Anders	Max	Sagebrush Ditch	Irrig.	.....	5	1	36	Dundy	July	21	1913	.....	1309
Spring creek	Carlon, J. C.	Benkelman	Benkelman Ditch	Irrig.	1.20	19	1	37	Dundy	Dec.	31	1896	.....	373
Stinking Water ck	Chase Co. Land & Live Stock Co.	Beatrice	Chase Co. L. & L. S.	Irrig.	2.86	10	7	38	Chase	March	10	1894	57	.....
Stinking Water ck	McLain, Frank	Imperial	McLain Ditch	Irrig.	2.50	28	7	37	Chase	Sept.	24	1894	65	.....
Stinking Water ck	L. B. Kellar Est	Wauneta	Chase Co. L. & L. S. Co., Ditch 7	Irrig.	4.57	36	7	37	Chase	Dec.	21	1894	72 175	.....
Stinking Water ck	Chase Co. L. & L. S. Co	Beatrice	Chase Co. L. & L. S. Co., Ditch 6	Irrig.	2.	13	7	38	Chase	Jan.	28	1895	76	.....
Stinking Water ck	Chase Co. L. & L. S. Co	Beatrice	Chase Co. L. & L. S. Co., Ditch 5	Irrig.	1.50	14	7	38	Chase	Jan.	29	1895	77	.....

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-B—(Concluded)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Stinking Water ck	Chase Co. L. & L. S. Co	Beatrice	Chase Co. L. & L. S. Co., Ditch 3	Irrig.	1.71	14	7	38	Chase	Jan.	29	1895	78	
Stinking Water ck	Chase Co. L. & L. S. Co	Beatrice	Chase Co. L. & L. S. Co., Ditch 4	Irrig	.91	14	7	38	Chase	June	27	1895		56
Stinking Water ck	Kilpatrick Bros.	Beatrice	Chase Co. L. & L. S. Co., Ditch 1	Irrig.	.70	4	7	38	Chase	June	27	1895		57
Stinking Water ck	Troutman, A. C.	Palisade	E. L. Light & Power Co.	P'wer	30.	30	5	33	Hayes	June	30	1908		907
Stinking Water ck	Krotter, F. C.	Palisade	F. C. Krotter No. 2	Irrig.	3.	35	5	34	Hayes	Dec.	15	1910		1046
Turkey creek	Wilt Polly	Naponee		P'wer		4	1	16	Franklin	Dec.	31	1874	183	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-C—(Concluded)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Little Blue river	Myers & Sidenburg	Oak	Oak Mill-Race	P'wer	16	16	3	5	Nuckolls				991*	
Little Blue river	Larkin, M. E.	Hastings	Crystal Lake	Stor	1.5	27	6	10	Adams	Aug.	17	1912		1219

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-D-

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Bear creek	Wolfe, J. V.	Lincoln	Wat. Wks. Institute for Feeble-Minded	D&Ir	1.	36	4	6e	Gage	May	20	1898		455
Beaver creek	Wright, G. D.	York		P'wer	40.	7	10	2w	York	Nov.	1	1878	963	
Blue River, Big	Holmesville M. & P. Co.	Holmesville	Holmesville M. & P. Co.	P'wer	500.	29	3	7	Gage	April		1882	1021	
Blue River, Big	C. B. & Q. R. R. Co.	Lincoln	C. B. & Q. Pipe Line	Irrig.		21	2	7	Gage				1038	*
Blue River, Big	C. B. & Q. R. R. Co.	Lincoln	C. B. & Q. Pipe Line	Irrig.		21	11	3	Seward				1041	*
Blue River, Big	Boyes, Burdette	Seward		P'wer	200.00	19	9	4e	Seward	July	8	1910		1006
Blue River, Big	Ashton, Edmund J.	Lincoln		P'wer	500.	4	8	4e	Saline	Oct.	31	1910		1035
Blue River, Big	Holmesville M. & P. Co.	Holmesville	Holmesville M. & P. Pl.	P'wer	500.	29	3	7e	Gage	May		1911		1095
Blue River, Big	Jacobs, E.	Staplehurst	Jacob's Elec. Light Plant	P'wer	41.	26	12	2e	Seward	Nov.	13	1911		1135
Blue River, Big	Blue Riv. Pow. Co.	Seward	Big Blue P. Plant No. 2	P'wer	100.	32	9	3e	Seward	Jan.	3	1912		1153
Blue River, Big	Olmstead, Edwin	Seward	Olmstead Elec. Plt.	P'wer		32	9	3	Seward	Dec.	17	1912		1247*
Blue River, Big	Steinmeyer, Geo.	Holmesville	Hoag Pow. Plt.	P'wer		12	4	5	Gage	Feb.	18	1913		1261*
Blue River, Big	Steinmeyer, Geo.	Holmesville	Barneston Pow. Plt.	P'wer		13	1	7	Gage	Feb.	18	1913		1262*
Blue River, Big	Boyes, Burdette	Seward	Blue Riv. Po. No. 3	P'wer	100.	5	8	4	Saline	March	13	1913		1265
Blue River, Big	Mares, Frank	Wilber	Mares Irr. Canal	Irrig.	2.28	2	6	4	Saline	Aug.	12	1913		1314
Blue River, Big	Boyes, Burdette	Seward	Blue River Power Plant	P'wer		5	8	4	Saline	Nov.	28	1913		1336*
Blue River, Big	Withers, Martha F.	Ulysses	Ulysses Flour Mill	P'wer		28	13	2	Butler	Feb.	3	1914		1349*
Blue River, Big	Beardslee, Chas. O.	Lincoln	Power Station No. 1	P'wer	120.	35	7	4	Saline	Feb.	17	1914		1353
Blue River, Big	Beardslee, Chas. O.	Lincoln	Power Station No. 2	P'wer	145.	1	5	4	Saline	Feb.	17	1914		1354
Blue River, Big	Beardslee, Chas. O.	Lincoln	Power Station No. 3	P'wer		3	4	5	Gage	Feb.	17	1914		1355*
Blue River, Big	Beardslee, Chas. O.	Lincoln	Power Station No. 4	P'wer		19	4	6	Gage	Feb.	17	1914		1356*
Blue River, Big	Beardslee, Chas. O.	Lincoln	Power Station No. 6	P'wer		13	1	7	Gage	March	27	1914		1363*
Blue River, Big	C. B. & Q. R. R. Co.	Lincoln	C. B. & Q. Pipe Line	Irrig.		2	9	3	Seward	April	30	1914		1366*

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Turkey creek	Lane, J. K.	Pleasant Hill		P'wer		4	7	3e	Saline				990	*
Turkey creek	Lane, J. K.	Pleasant Hill	Lane's Model Ditch	Irrig.	.60	4	7	3e	Saline	July	16	1895		81
Turkey Creek	Lane, J. K.	Pleasant Hill	Lane's Model Ditch	Irrig.					Saline	July	18	1895		84

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-E—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole	Haase, Chas. A.	Kimball	Bay State Ditch	Irrig.	1.50	29	15	55	Kimball	Dec.	31	1876	347	
Lodge Pole	Adams, John A.	Sidney	Adams & Tobin Ditch	Irrig.	1.14	35	14	50	Cheyenne	Oct.	1	1878	368	
Lodge Pole	Gunderson, A.	Potter	Gunderson Ditch	Irrig.	1.43	1	14	52	Cheyenne	June	1	1879	305	
Lodge Pole	Callahan, Chas.	Sidney	Runge Ditch No. 1	Irrig.	1.71	20	14	50	Cheyenne	April	15	1880	339	
Lodge Pole	Callahan, Chas.	Sidney	Runge Ditch No. 2	Irrig.	0.50	20	14	50	Cheyenne	April	15	1882	338	
Lodge Pole	Anderson, John	Sidney	Anderson Ditch No. 1	Irrig.	2.50	8	14	51	Cheyenne	June	30	1882	373	
Lodge Pole	Bennett Live Stock Co.	Kimball	Circle Arrow Ditch	Irrig.	3.71	30	15	54	Kimball	July	1	1882	346	
Lodge Pole	Pomeroy, E. V. S., et al	Sidney	Urbach Ditch	Irrig.	0.86	14	14	51	Cheyenne	Sept.	1	1882	308	
Lodge Pole	DeGraw, Geo.	Sidney	Hale Ditch No. 3	Irrig.	0.57	36	14	49	Cheyenne	April	30	1883	320	
Lodge Pole	DeGraw, Geo.	Sidney	Hale Ditch No. 4	Irrig.	0.71	36	14	49	Cheyenne	April	30	1883	321	
Lodge Pole	Hale, L. H.	Sidney	Hale Ditch No. 5	Irrig.	0.57	36	14	49	Cheyenne	April	30	1883	322	
Lodge Pole	Whitney, W. T.	Seattle, W.	Lower Whitney Ditch	Irrig.	2.29	31	14	48	Cheyenne	May	1	1883	317	
													309	
Lodge Pole	Booth, Firth	Sunol	Booths Canal	Irrig.	4.29	29	14	47	Cheyenne	May	31	1883	310	
Lodge Pole	McAuliffe, F.	Chappell	McAuliffe Ditch	Irrig.	2.29	21	13	45	Deuel	Dec.	31	1884	814	
Lodge Pole	Kinney, J. J.	Kimball	Kinney Ditch No. 2	Irrig.	2.71	33	15	56	Kimball	Dec.	31	1884	348	
													312	
													313	
Lodge Pole	Libby, H. H.	Lodge Pole	Libby Ditch	Irrig.	2.	36	14	47	Cheyenne	Dec.	31	1884	314	
													315	
Lodge Pole	Dickinson, F.	Lodge Pole		Irrig.	1.14	26	14	47	Cheyenne	Jan.	1	1885	969	
Lodge Pole	Howard, A. T.	Lodge Pole	Howard Ditch	Irrig.	0.86	31	14	47	Cheyenne	April	10	1885	336	
Lodge Pole	Krueger, Richard	Sidney	Krueger Ditch No. 3	Irrig.	1.14	32	14	48	Cheyenne	May	1	1885	323	
Lodge Pole	Wolf, H. D.	Chappell	Wolf Ditch	Irrig.	1.	18	13	45	Deuel	Dec.	31	1885	813	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-E—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole	Bennett, L. S. Co.	Kimball	McIntosh Ditch	Irrig.	3.31	23	15	55	Kimball	April	16	1886	351	
Lodge Pole	Krueger, Richard	Sidney	Krueger Ditch No. 2	Irrig.	2.29	32	14	48	Cheyenne	Oct.	10	1886	324	
Lodge Pole	Borgquist, C. E.	Sidney	Borgquist Canal	Irrig.	1.29	34	14	49	Cheyenne	April	30	1887	301	
Lodge Pole	Borgquist, C. E.	Sidney	Borgquist Canal	Irrig.	0.71	34	14	49	Cheyenne	April	30	1887	300	
Lodge Pole	Whitney, W. T.	Seattle, W.	Upper Whiteny Ditch	Irrig.	2.29	36	14	49	Cheyenne	May	1	1887	316	
Lodge Pole	McLaughlin, M.	Sidney	McLaughlin Ditch	Irrig.	1.	25	14	48	Cheyenne	May	1	1887	966	
Lodge Pole	DeGraw, Geo.	Sidney	Hale Ditch No. 1	Irrig.	1.14	36	14	49	Cheyenne	July	1	1887	318	
Lodge Pole	Mitchell, J.	Sidney		Irrig.	0.86	8	14	51	Cheyenne	Sept.	1	1887	304	
Lodge Pole	Craig, John	Sidney	Tobin Ditch	Irrig.	2.29	28	14	47	Cheyenne	July	31	1888	330	
Lodge Pole	Charlton, Jessie	Clinton, Iowa	Bordwell Ditch	Irrig.	1.43	35	14	49	Cheyenne	Aug.	1	1888	303	
Lodge Pole	Kinney, L. C.	Pine Bluffs, Wyo.	Premier Ditch	Irrig.	2.43	3	14	58	Kimball	April	11	1889	340	
Lodge Pole	Kinney, S. A.	Pine Bluffs, Wyo.	Smeed Ditch	Irrig.	1.43	8	14	58	Kimball	April	12	1889	341	
Lodge Pole	Charlton, Jessie	Clinton, Iowa	Bordwell Ditch	Irrig.	0.86	35	14	49	Cheyenne	April	27	1889	302	
Lodge Pole	Eubank, John	Kimball	Polly Ditch	Irrig.	0.79	30	15	55	Kimball	May	6	1889	342	
Lodge Pole	Cook, Chas	Pine Bluffs, Wyo.	Independent Ditch	Irrig.	3.14	7	14	58	Kimball	May	6	1889	343	
Lodge Pole	Howe, H. H.	Kimball		Irrig.	0.43	30	15	55	Kimball	May	6	1889	344	
Lodge Pole	Kinney, J. J.	Kimball	Kinney Ditch	Irrig.	2.	33	15	56	Kimball	May	14	1889	345	
Lodge Pole	Young, W. T.	Kimball	Young Ditch	Irrig.	0.50	33	15	57	Kimball	May	28	1889	349	
Lodge Pole	Yoder, B. F.	Kimball	Ruttner Ditch	Irrig.	1.14	31	15	56	Kimball	June	4	1889	350	
Lodge Pole	Oberfelder, R. S.	Sidney	Oberfelder Ditch	Irrig.	0.43	31	14	46	Cheyenne	June	10	1889	333	
Lodge Pole	DeGraw, Geo.	Sidney	Hale Ditch No. 2	Irrig.	0.43	36	14	49	Cheyenne	June	26	1889	319	
Lodge Pole	Bullock, W. C.	Lodge Pole		Irrig.	9.14	3	13	46	Deuel	June	25	1889	296	
Lodge Pole	Persinger, A. B.	Lodge Pole	Persinger Ditch	Irrig.	4.57	33	14	46	Deuel	June	25	1889	297	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-E—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole	Krueger, Richard	Sidney	Krueger Ditch No. 1	Irrig.	3.	29	14	48	Cheyenne	June	26	1889	325	
Lodge Pole	Bennett, L. S. Co.	Kimball	Brady Ditch	Irrig.	.71	28	15	54	Kimball	Aug.	16	1889	352	
Lodge Pole	Gross, Chas. J.	Pine Bluffs, Wyo.	Hoover Ditch	Irrig.	1.43	12	14	59	Kimball	Sept.	4	1889	353	
Lodge Pole	Bentley, B. M.	Potter	Ickes Ditch	Irrig.	2.50	33	14	50	Cheyenne	March	25	1891	329	
Lodge Pole	Adams, J. M.	Potter	Adams Ditch	Irrig.	1.43	3	14	52	Cheyenne	July	1	1891	371	
Lodge Pole	Girrard, F. G. & R. B.	Kimball	Hurley, Lilly & Polly D.	Irrig.	2.57	26	15	56	Kimball	Oct.	1	1891	354	
Lodge Pole	Thornstensen, Nels	Sidney	Christenson Ditch	Irrig.	.57	7	14	51	Cheyenne	April	15	1893	366	
Lodge Pole	Thornstensen, Nels	Sidney	Christenson Ditch No.1	Irrig.	.43	7	14	51	Cheyenne	April	15	1893	367	
Lodge Pole	Trognitz, Chas	Sidney	Trognitz Canal	Irrig.	1.	36	14	50	Cheyenne	June	1	1893	365	
Lodge Pole	Oberfelder, R. S.	Sidney	Oberfelder Ditch	Irrig.	2.	31	14	46	Cheyenne	Dec.	30	1893	306	
Lodge Pole	Krueger, Richard	Sidney	Richard Krueger Ditch	Irrig.	1.	29	14	48	Cheyenne	May	1	1894	968	
Lodge Pole	Anderson, J.	Sidney	Anderson Ditch No. 2	Irrig.	.57	10	14	51	Cheyenne	June	1	1894	372	
Lodge Pole	Adams, J. M.	Potter	Adams Ditch	Irrig.	1.43	10	14	52	Cheyenne	Sept.	1	1894	370	
Lodge Pole	Lyngholm, N. P.	Sidney	Lyngholm Ditch	Irrig.	.36	14	14	51	Cheyenne	Nov.	1	1894	337	
Lodge Pole	Adams, J. M.	Potter	Adams Ditch	Irrig.	.50	10	14	52	Cheyenne	Aug.	1	1895	369	
Lodge Pole	Dickinson, F.	Lodge Pole		Irrig.	2.29	33	14	47	Cheyenne	May	10	1896	967	
Lodge Pole	Burg, C. C.	Dix		Irrig.	.14	30	15	53	Kimball	March	3	1897		381
Lodge Pole	Bullock, W. C.	Lodge Pole	Bullock Canal	Irrig.	.57	4	13	46	Deuel	Feb.	16	1898		437
Lodge Pole	Forsling, Alf	Kimball	Maltese Cross	Irrig.	.21	36	15	57	Kimball	May	16	1898		454
Lodge Pole	Kinney, L. C.	Bushnell	Bushnell Ditch	Irrig.	3.	2	14	58	Kimball	April	15	1899		504
Lodge Pole	Wiegand, Henry G.	Chappell	Wiegand Canal	Irrig.	2.	17	13	45	Deuel	May	31	1900		563
Lodge Pole	Neuman, A. G.	Chappell	Neuman C. No. 1 & 2	Irrig.	1.89	36	13	45	Deuel	June	12	1900		565
Lodge Pole	McHatton, James W	Chappell	Wertz Bros. Ditch	Irrig.	2.86	12	13	46	Deuel	Feb.	14	1901		600
Lodge Pole	Neuman, G. R.	Chappell	Neuman Ditch	Irrig.	1.29	26	13	45	Deuel	April	17	1901		611
Lodge Pole	Johnson, J. C.	Chappell	Johnson Ditch	Irrig.	.30	23	13	45	Deuel	April	17	1901		612
Lodge Pole	Bennett, L. St. Co.	Cheyne Wyo.	Bennett L. S. Res	Irrig.	22.29	21	15	55	Kimball	March	13	1902		657
Lodge Pole	Nasland, J. A.	Chappell	Nasland Ditch	Irrig.	.90	1	12	45	Deuel	April	16	1902		661

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-E—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole	Clausen, John	Dix	Clausen S. S. Ditch	Irrig.	.57	27	15	54	Kimball	July	25	1902		683
Lodge Pole	Clausen, John	Dix	Clausen N. S. Ditch	Irrig.	.57	26	15	54	Kimball	July	25	1902		684
Lodge Pole	Bennett, L. St. Co.	Ch'yne, Wyo.	Bennett L. S. Co's. D.	Irrig.	1.87	23	15	55	Kimball	Oct.	2	1902		691
Lodge Pole	Forsling, Alf.	Kimball	Forsling Ditch	Irrig.	1.50	34	15	57	Kimball	April	24	1903		703
Lodge Pole	Forsling, C. A.	Kimball		Irrig.	1.83	33	15	56	Kimball	July	25	1903		718
Lodge Pole	Bickel, L. W.	Kimball	Bickel Ditch	Irrig.	.92	30	15	55	Kimball	Aug.	3	1903		719
Lodge Pole	Pomerory, E. V. S.	Sidney	Pomerory Ditch No. 1	Irrig.	.57	15	14	51	Cheyenne	Aug.	20	1903		723
Lodge Pole	Faden, E. L.	Kimball		Irrig.	.14	30	15	55	Kimball	Sept.	9	1903		724
Lodge Pole	Bennett, L. St. Co.	Ch'yne, Wyo.	Owasco	Irrig.	22.28	29	15	55	Kimball	Sept.	12	1903		725
Lodge Pole	Pyle, W. E.	Kimball	New Ruttner	Irrig.	.51	36	15	57	Kimball	Sept.	16	1903		727
Lodge Pole	Bennett, L. St. Co.	Ch'yne, Wyo.	Owasco	Irrig.	1.75	29	15	55	Kimball	Dec.	15	1903		734
Lodge Pole	Forsling, Alfred	Kimball	Forsling Ditch	Irrig.	.79	34	15	57	Kimball	Dec.	6	1905		806
Lodge Pole	McNew, H. C.	Julesburg, Col	Smith	Irrig.	3.57	12	12	45	Deuel	Aug.	18	1906		850
Lodge Pole	Soderquist, Peter	Chappell	Ralton	Irrig.	19.86	36	13	45	Deuel	Jan.	4	1907		847
Lodge Pole	Forsling, Clarence	Kimball	Yoder Extension	Irrig.	2.71	36	15	57	Kimball	April	9	1907		857
Lodge Pole	Walker, I. S.	Kimball	Walker Ditch	Irrig.	1.57	31	15	56	Kimball	Sept.	16	1907		869
Lodge Pole	Wilkinson, Mrs. John	Pine Bluff, Wyo.	Tracy Ditch	Irrig.	.50	12	14	59	Kimball	Sept.	21	1907		870
Lodge Pole	Soderquist, Peter	Chappell	Ralton	Irrig.	12.4	36	13	45	Deuel	Dec.	4	1907		882
Lodge Pole	Walker, I. S.	Kimball	Kimball Storage		20.000									
				Irrig.	acre ft	36	15	57	Kimball	April	15	1908		897
Lodge Pole creek	Wilds, Turner	Chappell	Wilds Ditch	Irrig.	.85	11	13	46	Deuel	June	2	1908		904
Lodge Pole	Ruttner, Carl	Sidney	Ruttner Canal	Irrig.	.57	30	14	47	Cheyenne	June	25	1908		906
Lodge Pole	Bennett L. St. Co.	Kimball	Bennett Ditch No. 5	Irrig.	1.	29	15	54	Kimball	Feb.	17	1909		931
Lodge Pole creek	Maginnis, P.	Kimball	Maginnis Ice Pond	Stor.	3.	26	15	56	Kimball	Sept.	19	1911		1127
Lodge Pole creek	Soderquist, Peter	Chappell	Soderquist Ditch	Irrig.	2.	36	12	45	Deuel	Oct.	22	1912		1237
Lodge Pole creek	Kreuger, Wm.	Sidney	Wm. Krueger D. No. 1	Irrig.		39	14	48	Cheyenne	June	30	1913		1301

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-E—(Concluded)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole creek	Bennett, Jno. D.	Cheyenne	Bennett Res.	Stor.	50.	22	15	55	Kimball	Aug.	11	1913		1313
Lodge Pole creek	Wiegand, H. G.	Chappell	Wiegand D. No. 3	Irrig.	1.28	16	13	45	Deuel	Sept.	10	1913		1322
Lodge Pole creek	Wiegand, H. G.	Chappell	Wiegand D. No. 2	Irrig.	.42	16	13	45	Deuel	Sept.	10	1913		1323
Lodge Pole creek	Karl Ruttner D.	Sunol	Ruttner, Karl	Irrig.		30	14	47	Cheyenne	March	4	1914		1350
Spg. ck. trib. to Lodge Pole	Oberfelder, R. S.	Kimball	Oberfelder Ditch	Irrig.	2.20	31	14	46	Cheyenne	May	29	1889	307	
Spg. ck. trib. to Lodge Pole	Chambers, C. P.	Sidney	Private Ditch	Irrig.	.04	14	13	51	Cheyenne	March	19	1895	335	
S. Br. trib. L. P.	Libby, H. H.	Sidney	Spring Branch Ditch	Irrig.	.29	36	14	47	Cheyenne	July	1	1901		623
Flood wat. from hill	Fifield, C. M.	Lodge Pole	Fifield Ditch	Irrig.	.57	22	15	56	Kimball	April	27	1911		1091

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 1-E—(Concluded)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Weeping Water ck	Gilmore, Chas. R	Weeping W'ter	Gilmore Ditch	Ire	8.	2	10	11e	Cass	Aug.	5	1909		955
Nemaha River	White, G. B.	Unadilla	White's Res	Stor.	5.	11	8	10	Otoe	Aug.	26	1914		1373

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-A—(Continued)

Source	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Beaver river	Quackenbush, J. W.	Albion	Pioneer Ditch	Irrig.	3.57	22	20	6	Boone	Dec.	8	1894	287	
Beaver river	Babcock, H. E.	Columbus	Great Eastern Canal	Irrig.		24	17	4	Nance	Jan.	22	1896		2191
Beaver river	Long, Wm. M.	Genoa	Windmill Irrigation	Irrig.	.14	14	17	4	Nance	March	31	1896		277
Beaver river	Rice, H.	Albion	Albion E. L. & P.	P'wer	67.	26	20	6	Boone	Oct.	3	1901		639
Beaver river	St. Edward Elec. Co.	St. Edward	St. Edward Elec. Co.	P'wer	134.	27	19	5	Boone	Feb.	11	1911		1058
Cedar river	Neb. Irr. & Power Co.	Ord	Cedar River Canal	Irrig.	175.	22	21	12	Wheeler	Sept.	14	1894	221	
Cedar river	Fullerton E. L. & P. Co.	Fullerton	Fullerton Elec. & Pow.	P'wer	200.	12	16	6	Nance	Sept.	9	1901		636
Cedar River	Arnold, F. G.	Fullerton	Cedar River Pow. Plt.	P'wer		33	17	6	Nance	April	15	1913		1274*
Cedar river	Arnold, F. G.	Fullerton	Cedar River Pow. Plt.	P'wer		33	17	6	Nance	Sept.	4	1913		1320*
Cedar river	Arnold, F. G.	Fullerton	Cedar River Pow. Plt.	P'wer	200.	36	18	7	Nance	Oct.	8	1913		1325
Cow creek	McNall, W. A.	Brownlee	Homestead Ditch	Irrig.	2.29	7	26	27	Cherry	July	14	1894	194	
Dry creek, trib. to Calamus	Fisher, Conrad	Burwell	Fisher Canal	Irrig.	4.29	24	23	17	Garfield	Dec.	27	1905		807
Dave creek	Koupal, Frank	Ord		Irrig.	.14	20	19	14	Valley	July	5	1912		1207
Goose creek	Erickson, P. C. & J. M.	Brewster	Erickson Ditch	Irrig.	8.	18	25	24	Brown	April	3	1895	209	
Goose creek	Giles, R. P., et al	Elsmere	Giles Ditch	Irrig.	10.	2	25	25	Cherry	June	1	1895	187	
Goose creek	Crook, F.	Giles	Crook Ditch	Irrig.	6.80	33	25	24	Brown	June	2	1896		345
Gracie creek	Shoemaker, A. E.	Burwell	Gracie High Line	Irrig	.29	29	23	17	Loup	July	9	1897		397
Lillian Creek	Lundy, Jas. W.	Doris	Lillian Cr. Canal	Irrig.	5.	1	19	20	Custer	Oct.	14	1912		1233

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate S	T	R	County	Date of Priority Month	D	Yr.	Docket No.	App. No.
Looking Class ck.	Gerrard, E. A. & F. H.	Monroe	Monroe Irr. Ditch	Irrig.	2.86	1	17	3	Platte	June	12	1894	289	.....
Looking ck.	Babcock, H. E.	Columbus	Great Eastern Canal	Irrig.	.....	5	17	3	Platte	Jan.	22	1896	.....	190b
Loup river	C. B. & Q. R. R. Co.	Lincoln	C.B. & Q.R.R. Pipeline	Irrig.	.....	9	12	14	Buffalo	.....	.....	.....	1039	*
Loup river	Babcock, H. E.	Columbus	Great Eastern Canal	Irrig.	64.33	27	17	4	Nance	Jan.	22	1896	.....	190b
Loup river	Babcock, H. E.	Columbus	New York Canal	Irrig.	300.	15	15	8	Nance	April	28	1896	.....	291
Loup river	Neb. Cen. Irr. Co.	Columbus	Columbus Development	P'wer	2700.	27	17	4	Nance	June	10	1903	.....	709
Loup river	Koenig, Arnold C.	Omaha	.....	P'wer	.....	32	17	4	Nance	Sept	30	1910	.....	1029*
Loup River	Boggs, Chas. T.	Lincoln	Schuyler Development	P'wer	2000.	28	17	1	Platte	March	23	1912	.....	1187
Loup River	Babcock, H. E.	Columbus	Palmer Pow. Plant	P'wer	.....	14	15	8	Nance	Feb.	5	1913	.....	255*
Loup River	Babcock, H. E.	Columbus	Kent Pow. Plant	P'wer	.....	1	17	5	Nance	Feb.	5	1913	.....	1256*
Loup River	Babcock, H. E.	Columbus	St. Paul Pow. Plant	P'wer	.....	7	15	9	Merrick	Feb.	5	1913	.....	1257*
Loup river, N. B	Nor. Loup Irr. & Im. Co	North Loup	North Loup Ditch	Irrig.	143.	27	19	14	Valley	Aug.	7	1894	227	.....
													228	.....
													232	.....
Loup river, N. Br	Lee, J. R.	Brownlee	Lee Ditch	Irrig.	40.	25	27	29	Cherry	Aug.	7	1894	188	.....
													189	.....
													356	.....
Loup river, N. Br	Burwell Irr. Co.	Burwell	Burwell Irr. Ditch	Irrig.	110.	27	21	17	Loup	Sept.	7	1894	224	.....
Loup river, N. Br	Newton Irr. Dist	Moulton	Newton Irr. Canal	Irrig.	115.14	35	23	21	Blaine	Feb.	5	1895	205	.....
Loup river, N. Br	Erickson, P. C.	Brewster	Homestake Irr. Canal	Irrig.	51.43	27	23	22	Blaine	Sept.	10	1895	.....	152
Loup river, N. Br	Tzschuck Canal Co.	Taylor	Tzschuck Canal	Irrig.	242.86	30	22	19	Loup	June	5	1896	.....	301
Loup River, N. B.	Burwell Elec Co	Burwell	Burwell Ele. Pow. P.	P'wer	1000.	10	21	16	Garfield	Mar.	24	1911	.....	1077
Loup River, N. B.	Farmers Land Co.	Omaha	Homestake Irr. Canal	Irrig.	.....	27	23	22	Blaine	July	20	1912	.....	1210*
Loup R. Mid. Br.	Sherman C. Irr. Water Power & Imp. Co.	Loup City	Sherman County Canal	P'wer	125.	26	17	16	Valley	Fall of	....	1888	229	.....
Loup R. Mid. Br.	Middle Loup Valley Irr. Canal Co.	Sargent	Middle Loup Val. I. C.	Irrig.	560.29	15	21	22	Blaine	June	6	1894	202	.....

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-A—(Continued)

Stream	Name of Claimant	Address Post-Office	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate S	T	R	County	Date of Priority Month	D	Yr.	Docket No	App. No.
Loup R. Mid. Br.	Douglas Grove Irr. Dist.	Comstock	Westcott Irr. Ditch	Irrig.	88.57	15	19	18	Custer	Aug.	8	1894	214	
Loup R. Mid. Br.	Sherman Co. Irr. Wat. Pr. & Imp. Co.	Loup City	Sherman County Canal	Irrig.	244.	26	17	16	Valley	Aug.	13	1894	229	
Loup R. Mid. Br.	Thedford Irr. & Pr. Co.	Thedford	Thedford Ditch	Irrig.	43.	4	23	29	Thomas	Aug.	25	1894	198	
Loup R. Mid. Br.	Purdum, J. W.	Thedford	Norway Irr. Ditch	Irrig.	2.86	31	24	29	Thomas	Sept.	8	1894	199	
Loup R. Mid. Br.	Lillian P. D. & P. Co.	Gates	Lillian Prec. Ditch	Irrig.	140.00	30	21	21	Blaine	Oct.	19	1894	204 216	
Loup R. Mid. Br.	Lundy, Jas. W.	Sargent	Lundy Mill & Power Plt.	P'wer		9	19	19	Custer				1024*	
Loup R. Mid. Br.	C. B. & Q. R. R. Co.	Lincoln	C. B. & Q. Pipe Line	Irrig.		18	24	30	Thomas				1040	*
Loup R. Mid. Br.	Jewett, L. H.	Broken Bow	Jewett Ditch	Irrig.	4.29	30	22	24	Blaine	Aug.	12	1895		113
Loup R. Mid. Br.	Harris, L. H.	Dunning	Harris Canal	Irrig.	5.71	16	22	25	Blaine	Feb.	21	1896		248
Loup R. Mid. Br.	Patton, J. A.	Ord	Arcadia Canal	Irrig.	20.	16	17	16	Valley	March	6	1896		262
Loup R. Mid. Br.	Webster Irr. & Canal Co.	Comstock	Webster Canal	Irrig.	1.71	20	19	17	Custer	March	5	1898		442
Loup R. Mid. Br.	Longwood Irr. Canal Co.	Comstock	Longwood Irr. Canal	Irri.	12.93	20	19	17	Custer	Feb.	21	1912		1175
Loup R. Mid. Br.	Muhlback, Fred	Mullen	Mullen Grist & L. Plant	P'wer	124.	6	24	32	Hooker	Mar.	12	1912		1185
Loup R. Mid. Br.	St. Paul Elec. Light Wk.	St. Paul	St. Paul Elec. L. Works	P'wer	2000.	3	14	10	Howard	Aug.	12	1912		1216
Loup R. Mid. Br.	Lundy, Jas. W.	Sargent	Lundy M. & Pow. Plt.	P'wer	400.	9	19	19	Custer	Sept.		1912		1224
Loup R. Mid. Br.	U. S. of America	Halsey	Nursery Ditch	Irrig.	1.	3	22	26	Thomas	Sept.	16	1912		1226
Loup R. Mid. Br.	Lundy, Jas. W.	Doris	Mid. Loup Pow. Plt.	P'wer	500.	36	20	21	Custer	Oct.	15	1912		1234
Loup R. Mid. Br.	Holmes, Eddy	Nemo	Loup Val. Irr. Can.	Irrig.	.85	36	20	21	Custer	May	31	1913		1294
Loup R. Mid. Br.	Lundy, Jas. W.	Sargent	Lundy's Lake Can.	Irrig.	28.31	4	19	19	Custer	June	27	1913		1300
Loup R. Mid. Br.	Lundy, Jas. W.	Sargent	Lundy's Lake	Stor.	8.	2	19	19	Custer	July	19	1913		1306
Loup R. Mid. Br.	Lundy, Jas. W.	Sargent	Lundy's Lake	Irrig.	6.34	4	19	19	Custer	July	19	1913		1307
Loup R. Mid. Br.	Lundy, Jas. W.	Sargent	Bill's Lake Canal	Irrig.	118.	36	20	21	Custer	July	19	1913		1308
Loup R. Mid. Br.	Austin Irr. Ditch Co.	Loup City	Austin Irr. Ditch	Irrig.		32	13	14	Sherman	Nov.	6	1913		1330*
Loup R. Mid. Br.	Lewis, A. M.	Loup City	Lewis Pipe Line	Irrig.		20	15	14	Sherman	Nov.	17	1913		1334*
Loup R. Mid. Br.	Grand Island Elec. Co.	Grand Island	Grand Is. Elec. Co.	P'wer	1000.	30	13	12	Hall	July	14	1914		1373

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-A—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Loup R. So. Br.	Tillson, W. Z.	Poole Siding	Tillson Ditch	Irrig.	15.57	29	12	15	Buffalo	Dec.	28	1894	236	.....
Loup R. So. Br.	Boblitz, E. J.	Tuckerville	Boblitz Ditch	Irrig.	.50	10	14	21	Custer	Jan.	17	1895	219	.....
Loup R. So. Br.	Boblitz, E. J.	Tuckerville	Boblitz Ditch	P'wer	20.	10	14	21	Custer	Jan.	17	1895	219	.....
Loup R. So. Br.	Callaway Mill Co.	Calaway		P'wer		2	15	23	Custer				*988	.....
Loup R. So. Br.	Brown. A. D.	Milldale	Brown Canal	Irrig.	.86	31	17	24	Custer	Feb.	20	1897	.....	363
Loup R. So. Br.	Hartzell, B. F.	Logan	Hartzell's Ditch	Irrig.	.37	27	18	26	Logan	May	18	1897	.....	396
Loup R. So. Br.	Flagg, W. J.	Miller	W. J. Flagg Ditch	Irrig.	5.71	11	12	18	Buffalo	April	15	1913	.....	1275
Muddy creek	Penn, Chas.	Broken Bow	Penn's Ditch	Irrig.	.50	33	17	20	Custer	Aug.	14	1894	215	.....
Muddy creek	Benson, Wm. C.	Litchfield	Litchfield Mills	P'wer		33	14	16	Sherman				999	*
Mira creek	McClellan, M. E.	North Loup	Mira Reservoir	Stor.	1.14	26	18	13	Valley	Mar.	8	1912	.....	1182
Mira res.	McClellan, M. E.	North Loup		Irrig.	1.32	26	18	13	Valley	Oct.	30	1912	.....	1239
Platte river	Fremont C. & P. Co.	Fremont	Fremont Canal	P'wer	2500.	30	17	4e	Butler	June	21	1895	.....	40
Platte river	Fremont & Omaha P. Co	Omaha	Fremont & Omaha	P'wer	2000.	30	17	4e	Butler	March	25	1908	.....	894
Platte River	Fremont C. & P. Co.	Fremont	Fremont C. & P.	P'wer		29	17	4	Butler	Oct.	9	1912	.....	1232*
Sand creek	Troyer, J. D.	Callaway	Troyer Res. Pump	Irrig.		10	15	23	Custer	Jan.	14	1914	.....	1347*
Shell creek	Schmitt, P.	Columbus	Schmitt's Irr. Canal	Irrig.	3.	19	18	1e	Platte	Dec.	17	1894	292	.....
Shell creek	Schmitt, P.	Columbus	Schmitt's Irr. Canal	P'wer	30.50	19	18	1e	Platte	Dec.	17	1894	292	.....
Shell creek	Gottberg, Max	Columbus	Gottberg Irr. Pl.	Irrig.	1.	24	18	1	Platte	June	6	1895	.....	2
Shell creek	Babcock, H. E.	Columbus	Great Eastern Canal	Irrig.		27	17	1	Nance	Jan.	22	1896	.....	219b
Slough	Novotny, John	Schuyler	Novotny Ditch	Irrig.		13	17	3	Colfax	Oct.	20	1913	.....	1327*
Spring creek	Hendryx, H. J.	Monroe	Hendryx Ditch	Irrig.	1.33	2	17	3	Platte	June	25	1894	290	.....

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-A—(Continued)

Stream	Name of Claimant	Address Post-Office	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No	App. No.
						S	T	R	County	Month	D	Yr		
Spring br	Milldale F. & L. S. Imp. Co	Council Blfs.	Haskill Ditch	Irrig.		31	17	24	Custer	Feb.	27	1914		1357
Wiggle creek	Bender, Geo. O.	Callaway		Irrig.		3	15	23	Custer	Oct.	16	1913		1326*
Victoria creek	Daily, Gilligan & Co.	Anselmo	Victoria Irr. Plant	Irrig.	2.29	1	19	21	Custer	March	17	1894	210 212	
Victoria creek	Victoria Ditch Ass'n	Gates	Victoria Ditch	Irrig.	4.29	1	19	21	Custer	July	17	1894	213	
Victoria creek	Laughran, T., et al	New Helena	Laughran & Bell Ditch	Irrig.	4.	3	19	21	Custer	Sept.	22	1894	217	
Victoria creek	Bishop, E. N.	Gates	Victoria Ditch	Irrig.		1	19	21	Custer	April	2	1912		1189*

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-B—(Concluded)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Battle creek	Steffen, Aug.	Battle creek	Battle Creek Mills	P'wer	10.67	36	24	3	Madison	Nov.	12	1878		484
Battle creek	Steffen, Aug.	Battle creek	Battle Creek Mills	P'wer	20.	36	24	3	Madison	April	20	1906		818
Clear Lake	Lyons Drainage Dist	Lyons	Main Ditch No. 1	Drain		14	23	8e	Burt	March	4			1069
Elkhorn river	Skrdla, Joseph	Atkinson	Atkinson Mill	P'wer	38.50	30	30	14	Holt	Nov.	1	1883	271	
Elkhorn river	Elkhorn Irr. Co.	O'Neill	Elkhorn Irr. Canal	Irrig.	131.43	22	29	13	Holt	Feb.	3	1894	{259 {263	
Elkhorn river	Davis, Jos.	O'Neill	Davis Ditch	Irrig.	1.43	31	29	11	Holt	Feb.	8	1894	260	
Elkhorn river	Carlon, Thos.	O'Neill	Carlon Ditch No. 1	Irrig.	1.	32	29	11	Holt	Feb.	8	1894	261	
Elkhorn river	Carlon, Thos.	O'Neill	Carlon Ditch No. 2	Irrig.	5.	30	29	11	Holt	Feb.	8	1894	262	
Elkhorn river	Cain, N. E., et al.	O'Neill		Irrig.	5.	32	29	11	Holt	Feb.	20	1895	283	
Elkhorn river	Ross, Chas. P.	Omaha	Platte River Hydro Elec. Power Co.	P'wer	500.	14	15	10e	Douglas	Nov.	24	1909		971
Elkhorn River	Neligh, W. T. S.	West Point	West Point Hy. E. Pow.	P'wer	400.	18	22	6	Cuming	Dec.	26	1912		1250
Elkhorn, N. Fk.	Sugar Cy. Cereal	Norfolk	Sugar Cy. Cereal	P'wer	100.	23	24	1	Madison	March	1	1870	996	
Elkhorn, S. Br.	Rothleutner, Albert	Ewing	Flouring Mill	P'wer	33.	3	26	9	Holt	Aug.	21	1898		464
Middle creek	Malone, Robert	Lincoln	Malone Ice Plant	Ice	10.	30	10	6e	Lancaster	Dec.	26	1907		885
Oak creek	Eiche, Herman	Lincoln	Eiche Irri. Plant	Irrig.	.71	17	10	6e	Lancaster	Jan.	4	1899		489
	Ross, Chas. P.	Omaha	Platte River Hydro Elec. Power Co.	P'wer	2500.	6	11	10e	Douglas	Nov.	24	1909		970

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-B—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Platte River	Parmalee & Rawls	Plattsmouth	Plattsmouth Pow. Co.	P'wer		32	13	13	Cass	Jan.	3	1914		1343*
Platte river	Parmalee & Rawls	Plattsmouth	Plattsmouth Pow. Co.	P'wer		32	13	13	Cass	Sept.	4	1914		1379*
Ryan's Lake	Elk Riv. Drainage Dist.	Fremont	Cutoff "H"	Drain		4	17	9	Dodge	Oct.	16	1909		963
Springs	Newton Land Co.	Omaha	Sp. Br. Aqueduct	Irrig.	.07	13	14	13e	Sarpy	June	18	1895		29
Silver creek	Armour & Co.	So. Omaha	Armour & Co. Res.	Ice	10.	7	13	9e	Saunders	Oct.	18	1897		415
Stevens creek	Moore, R. E.	Lincoln	Stevens Cr. Irr. Proj.	Irrig.		2	10	7	Lancaster	Nov.	19	1913		1335*
Union and Taylor creeks	Bley, Louis G.	Madison	Union Val. R. Mills	P'wer		32	22	1w	Madison				*998	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-C

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet Granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Abitz creek	Fullerton, J. B.	Atkinson	Fullerton Ditch No. 2	Irrig.	.36	18	30	13	Holt	March	23	1896		278
Antelope creek	Julian, A. R., et al	Gordon	Antelope Ditch	Irrig.	.36	21	32	40	Cherry	June	29	1905		798
Ashburn creek	Zilmer, W. H.	Valentine	Ashburn Canal	Irrig.	.43	27	34	26	Cherry	June	17	1902		676
Bear creek	Skinner, Thos	Springview	Skinner Ditch	Irrig.	.22	15	32	21	Keya Paha	June	20	1888	609	
Bear creek	Cedarburg, P.	Springview	Cedarburg D. Nos. 1 & 2	Irrig.	.02	3	32	21	Keya Paha	Oct.	3	1898		479
Beeman ck., Old	Barnard, C. O.	Springview	Barnard Ditch	Irrig.	.43	21	32	20	Keya Paha	June	1	1892	603	
Beeman creek	Beeman, J. D.	Springview	Beeman Ditch	Irrig.	1.	23	32	20	Keya Paha	May	20	1892	620	
Beeman creek	Rickman, A. L.	Springview	Beeman & Rickman	Irrig.	.29	23	32	20	Keya Paha	July	25	1895	613	
Big Sandy creek	Pickler, W. S.	Badger	Badger Ditch	Irrig.	1.14	12	33	14	Holt	May	16	1902		667
Big Sandy creek	Strain, Jos	Butte	Badger Mill	P'wer	35.	12	33	14	Holt	Aug.	28	1902		685
Blackbird creek	Mullen, A. F.	O'Neill	Mullen Ditch	Irrig.	1.	20	31	11	Holt	Aug.	18	1894	267	
Bluebird creek	Murphy, P.	O'Neill	Murphy's Ditch	Irrig.	1.	26	30	11	Holt	Sept.	7	1894	273	
Boardman creek	Lee, Joseph S.	Chesterfield	Lee Ditch	Irrig.	6.86	6	29	33	Cherry	April	25	1895	973	
Boardman creek	Bachelor, J. H.	Valentine	Boardman Ditch	Irrig.	28.57	33	30	32	Cherry	Jan.	17	1912		1155
Box Butte creek	Sandoz, Wm.	Moomaw	Billy's Ditch	Irrig.	.21	29	29	45	Sheridan	Jan.	13	1900		533
Brush creek	Neb. Townsite Co.	Perry	Brush creek Power Co.	P'wer	15.	23	33	13	Holt	Sept.	28	1898		474

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-C—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Brush ck. E. Br.	McCarthy, M. H., et al	O'Neill	McCarthy Ditch No. 1	Irrig.	.50	24	32	14	Holt	July	1	1894	264	
Brush W. Br.	McCarthy, M. H., et al	O'Neill	McCarthy Ditch No. 2	Irrig.	.63	26	32	14	Holt	Aug.	15	1894	266	
Burton creek	Mutz, Otto	Springview	Burton Creek Dicth	Irrig.	.57	19	34	19	Keya Paha	June	30	1895	608b	
Burton creek	Mutz, Otto	Springview	One Trip Ditch	Irrig.	.35	2	33	20	Keya Paha	Sept.	2	1895		142
Canyon	Gilmore, Emery	Glen	Gilmore Canal	Irrig.	14.29	36	30	54	Sioux	July	5	1907		863
Cedar creek	McNamee, K. M	Wood Lake	Cedar Creek Ditch	Irrig.	.43	4	30	24	Cherry	Sept.	28	1910		1027
Cottonwood ck.	Morrissey, Tim	Dunlap	Morrissey's Ditch	Irrig.	.71	17	29	48	Dawes	Feb.	16	1895	481	
Cottonwood ck.	Fendrich & Lichte	Dunlap	Fendrick & Lichte Ditch	Irrig.	.64	22	29	48	Dawes	May	9	1896		336
Cottonwood creek	Lichte, Hugo	Dunlap	Dunlap Ditch	Irrig.	.50	22	29	48	Dawes	July	18	1911		1113
Crooked creek	Mutz, Otto	Springview		P'wer	3.	19	34	19	Keya Paha	Dec.	31	1889	608a	
Crooked creek	Mutz, Otto	Springview	Crooked Creek Ditch	Irrig.	1.	19	34	19	Keya Paha	June	30	1895	608b	
Cross creek	Hutchison, W. H.	Penbrook	Hutchinson	Irrig.	.21	8	33	24	Keya Paha	Sept.	1	1888	615	
Cub creek	Tissue & Patterson	Springview	Tissue & Patterson Ditch	Irrig.	.03	16	33	22	Keya Paha	June	30	189	618	
Cub creek	Josiassin, S.	Meadville	McCumber Ditch	Irrig.	.10	28	33	22	Keya Paha	Aug.	15	189	589	
Eagle creek	Bokhof, Wm	Atkinson	Bokhof Ditch	Irrig.	2.86	6	30	13	Holt	Sept.	18	189	275	
Eagle creek	Robertson, J. A.	Atkinson	Eagle Valley Ditch	Irrig.	2.29	1	30	14	Holt	March	5	18	280	
Eagle ck. S. Br.	Becker, Sam'l	Atkinson	Becker Ditch	Irrig.	1.14	8	30	13	Holt	Nov.	30	189	274	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-C—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Fairfield creek	Kuhre, Wm. M.	Johnstown	Kuhre's Pond	P'wer	25.	31	33	23	Brown	Sept.	1	1893	612a	
Fairfield creek	Kuhre, Wm. M.	Johnstown		Irrig.	.14	31	33	23	Brown	April	1	1894	612b	
Holt creek	Schoetger, F. J.	Enterprise	Schoetger Ditch	Irrig	.14	32	35	20	Keya Paha	Feb.	23	1895	595	
Holt creek, S. Br.	Akers, J. W.	Springview	Akers Ditch	Irrig	.14	1	34	21	Keya Paha	Aug.	1	1894	611	
Horse Head creek	Bruce, A.	Penbrook	Bruce Ditch	Irrig.	.17	16	33	24	Keya Paha	Sept.	7	1895		149
Huggins creek	Soper, H. K.	Enterprise	Soper Ditch	Irrig.	.14	21	35	20	Keya Paha	Nov.	6	1894	592	
Jewett creek	Jewett, C. P.	Meadville	B. L. Ditch	Irrig.	.71	5	32	21	Keya Paha	Oct.	23	1894	590	
Keha Paha river	Yocum, J. C.	Butte	Yocum's Ditch	Irrig.	1.14	23	34	15	Boyd	Sept.	7	1894	573	
Keha Paha river	Bruce, Andrew & Son	Naper	Bruce Roller Mills	P'wer	100.	24	34	16	Boyd	Oct.	5	1903		729
Kibby Creek	Green, Martha, J.	Read	Green Ditch	Irrig.	.01	28	34	16	Boyd	April	1	1904		747
Lewis Spring	Lewis, Ralph	Enterprise	Lewis Ditch	Irrig.	.14	29	35	19	Keya Paha	Aug.	30	1895		139
Long Pine creek	Kyner, S. H.	Long Pine	Long Pine Light & Pr. Plant	P'wer	48.	30	30	20	Brown	April	2	1909		941
Middle E. Br.	McGuire, M. W.	Norden	McGuire Ditch	Irrig.	.71	32	33	23	Keya Paha	June	1	1884	606	
Middle W. Br.	Allen, M. M.	Norden	Allen Ditch	Irrig.	.50	29	33	23	Keya Paha	June	1	1891	616	
Middle W. Br.	Allen, M. M.	Norden	Continuance Ditch	Irrig.	1.	29	33	23	Keya Paha	May	2	1904		753
Minnechaduza	Gilman, S. F.	Neligh	Pierce Milling Co.	P'wer	35.	30	34	27	Cherry	Sept.	12	1896		359

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-C—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate S	T	R	County	Date of Priority Month	D	Yr.	Docket No.	App. No.
Minnechaduza	City of Valentine	Valentine	Valentine Pow. Plt.	P'wer	40.	29	34	27	Cherry	April	16	1913		1279
Newman creek	Newman, Philo	Norden	Newman Ditch	Irrig.	.21	17	33	24	Keya Paha	July	1	1888	617	
Niobrara river	Richards, B.	Chadron	Lakotah Ditch	Irrig.	7.14	1	30	57	Sioux	Oct.	1	1883	554	
Niobrara river	S. B. Coffee Estate	Chadron	Earnest Ditch No. 1	Irrig.	2.86	9	29	53	Sioux	May	1	1885	514a	
Niobrara river	Bruce, A.	Penbrook	Bruce's Mill	P'wer	60.	16	33	24	Keya Paha	April	1	1886	610	
Niobrara river	Cook, J. H.	Agate	McG. & S. Ditch	Irrig.	8.21	25	29	56	Sioux	May	1	1887	513a	
Niobrara river	Furman, Nellie B.	Marsland	Pioneers Ditches	Irrig.	7.14	36	29	51	Dawes	Aug.	1	1887	442	
Niobrara river	McLaughlin, A. H.	Marsland	McLaughlin Ditch	Irrig.	7.14	9	28	52	Box Butte	May	1	1888	566	
Niobrara river	Cook, J. H.	Agate	McG. & S. L'r S D.	Irrig.	1.71	25	29	56	Sioux	May	1	1890	513b	
Niobrara river	S. B. Coffee Estate	Chadron	Earnest Ditch No. 1	Irrig.	2.14	9	29	56	Sioux	May	15	1891	541b	
Niobrara river	Cook, J. H.	Agate	Cook Ditch Nos. 1 & 2	Irrig.	3.54	1	28	56	Sioux	May	31	1891	980	
Niobrara river	Hoyt, Wm. L.	Harrison	Bigelow & Seymour	Irrig.	2.40	19	31	57	Sioux	June	8	1891	510	
Niobrara river	Skavdahl, Oscar	Butte	Harris & Neece Ditch	Irrig.	8.57	3	28	55	Sioux	July	1	1892	517	
Niobrara river	Furman, Nellie B.	Marsland	Pioneer Ditches	P'wer	10.	31	29	50	Dawes	Aug.	1	1893	442	
Niobrara river	Roll Mill Co.	Marsland	Roll Mill	P'wer	35.	5	28	51	Box Butte	Sept.	10	1893	970	
Niobrara river	Green, Frank J.	H'm'ford	Meridian Ditch	Irrig.	.57	25	29	50	Dawes	Jan.	10	1894	459	
Niobrara river	Wood, J. C., et al.	Marsland	Enterprise Ditch	Irrig.	5.71	28	29	50	Dawes	Jan.	27	1894	461	
Niobrara river	Furman, H. G.	Marsland	Furman Ditch	Irrig.	3.64	29	29	50	Dawes	Feb.	2	1894	462	
Niobrara river	Johnson, B. F.	Harrison	Johnson Ditch	Irrig.	2.86	36	31	57	Sioux	May	1	1894	511	
Niobrara river	McMannis, J. T., et al.	H'm'ford	McM. & Neeland Ditch	Irrig.	.86	29	29	49	Dawes	June	15	1894	463	
Niobrara river	Tienken, Chas.	Dustin		Irrig.	1.	12	33	16	Boyd	Oct.	1	1894	575	
Niobrara river	McCully, S. J.	Carns	McCully Ditch	Irrig.	8.57	25	32	20	Keya Paha	Aug.	7	1894	583	
Niobrara river	Wilson, J. A.	Springview	Wilson Canal	Irrig.	5.71	18	32	21	Keya Paha	Oct.	18	1894	591	
Niobrara river	Mirage Irr. Co.	Mirage	Mirage Canal	Irrig.	150.	26	29	48	Dawes	Nov.	28	1894	474	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-C—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Niobrara river	Lichte, H.	Dunlap	Lichte Ditch	Irrig.	1.43	27	29	48	Dawes	Jan.	24	1895	479	
Niobrara river	Warneke, H.	Harrison	Warneke's Ditch	Irrig.	1.57	27	31	57	Sioux	Feb.	18	1895	505	
Niobrara river	Cook, C. H.	Royville	McG. & S. Upp. Ditch	Irrig.	2.86	23	29	56	Sioux	Feb.	25	1895	521	
Niobrara river	Harris, Octave	Marsland	LaBelle Ditch	Irrig.	2.	6	28	54	Sioux	March	12	1895	518	
Niobrara river	Furman, H. G.	Marsland	Snow Ditch	Irrig.	2.86	35	29	51	Dawes	March	26	1895	485	
Niobrara river	Hughes, Mary F.	Marsland	Excelsior Ditch	Irrig.	2.86	10	28	52	Box Butte	May	15	1895	568	
Niobrara river	Hughes, Mary F.	Marsland	Hughes Ditch	Irrig.		1	28	52	Box Butte				*987	
Niobrara river	Mann, John E.	Harrison	Bourrett Ditch	Irrig.	2.	33	30	56	Sioux	June	8	1895		4
Niobrara river	Bourrett, P.	Harrison	Bourrett, Sr., Ditch	Irrig.	1.16	29	30	56	Sioux	June	10	1895		5
Niobrara river	Hughes, Mary F.	Marsland	Hughes Ditch	Irrig.	1.	1	28	52	Box Butte	June	26	1895		52
Niobrara river	Harris, O.	Marsland	LaBelle Ditch	Irrig.	3.14	6	28	54	Sioux	July	3	1895		60
Niobrara river	Bond & Tissot	Peters	Usher Ditch	Irrig.	1.16	19	29	46	Sheridan	July	17	1895		82
Niobrara river	Bennett, Sadie C.	Omaha	Moore Ditch	Irrig.	5.71	9	28	53	Sioux	July	22	1895		88
Niobrara river	Peters, H .A., et al	Hay Spgs.	Hay Springs Canal	Irrig.	14.29	29	29	47	Dawes	Sept.	27	1895		173
Niobrara river	Mettlen, J., et al	Marsland	Mettlen Ditch	Irrig.	1.	4	28	54	Sioux	April	27	1896		292
Niobrara river	Neeland, Sarah J.	H'm'ford	McM. & Neeland Ditch	Irrig.	1.93	29	29	49	Dawes	April	9	1898		448
Niobrara river	Armstrong, T. S.	Butte	Armstrong Canal	P'wer	150.	9	33	13	Boyd	May	14	1898		452
Niobrara river	Green, Frank J.	H'm'ford	Meridian Ditch	Irrig.	5.14	25	29	50	Dawes	Aug.	29	1898		469
Niobrara river	Bourrett, J. F.	Harrison	Bourrett's Ditch	Irrig.	1.	29	30	56	Sioux	March	5	1900		542
Niobrara river	Bourrett, J. S.	Harrison	J. S. Bourrett Ditch	Irrig.	1.71	19	30	56	Sioux	March	17	1900		546
Niobrara river	Montague, Jas.	Dunlap	Montague & Lichte Ditch	Irrig.	.43	27	29	48	Dawes	Sept.	27	1900		575
Niobrara river	Fendrich, B.	Dunlap	Chadek Ditch	Irrig.	.30	26	29	48	Dawes	Mar.	18	1901		607
Niobrara river	Fendrich, G. A.	Dunlap	Fendrich Ditch	Irrig.	.29	32	29	48	Dawes	June	1	1901		616
Niobrara river	Fendrich, G. A.	Dunlap	Fendrich Ditch	Irrig.	.27	32	29	48	Dawes	June	1	1901		617
Niobrara river	Cornell, O. H.	Valentine	Valentine Power Plant	P'wer	1600.	27	34	27	Cherry	Jan.	29	1902		652
Niobrara river	Potmesil Bros.	Dunlap	Potmesil Ditch	Irrig.	6.	26	29	48	Dawes	May	19	1904		757

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-C—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Niobrara and Pepper creek	Taylor, D. T.	Hay Springs	Taylor s Ditch	Irrig.	4.57	28	29	47	Dawes	Aug	8	1904		766
Niobrara river	Kay, John L.	Marsland	Kay Ditch	Irrig.	2.	6	28	53	Dawes	May	12	1905		791
Niobrara river	Kirk, E. L.	Sioux City, Ia	Nebraska Power Co	P'wer	900.	34	32	7	Knox	Sept	24	1909		961
Niobrara river	Koenig, Arnold C.	Omaha	Niobrara Power Plant	P'wer	700.	34	32	7	Knox	Aug.	9	1910		1019
Niobrara river	Kirk, E. L.	Sioux City, Ia	Nebraska Power Co	P'wer	1200.	24	32	8	Knox	April	23	1910		996
Niobrara river	Mann, John E.	Harrison	Bieser Ditch	Irrig.	.75	4	29	56	Sioux	Jan.	23	1911		1056
Niobrara river	Mann, John E.	Harrison	Ex. Bourrett Ditch	Irrig.	1.21	33	30	56	Sioux	Jan.	23	1911		1057
Niobrara river	Lodence, W. M.	Dunlap	Lichte Irr. Ditch	Irrig.	3.	27	29	48	Dawes	April	7	1911		1086
Niobrara river	Dieriex, Camille	Rushville	Camille Ditch	Irrig.	1.53	19	30	43	Sheridan	April	10	1911		1087
Niobrara river	Montague, Jas.	Dunlap	Lichte Ditch	Irrig.	.71	27	29	48	Dawes	April	19	1911		1088
Niobrara river	Hopkins, Thos. L.	Hemingford	Potmasil Bros. Ditch	Irrig.	.28	25	20	48	Sioux	Jan.	2	1912		1152
Niobrara river	Bourrett, John	Harrison	John Bourrett Ex. No. 1	Irrig.	.11	29	30	56	Box Butte	Mar.	25	1912		1183
Niobrara river	Wells, Harry E.	Butte	Wells Pumping System	Irrig.	1.64	32	32	40	Sheridan	May	2	1912		1193
Niobrara river	Bourrett, John	Harrison	John Bourrett Ex. No. 2	Irrig.	.21	32	30	56	Sioux	July	19	1912		1209
Niobrara river	Buhman, Herman P.	Leigh	Bristow-Lynch Pow. Plt.	P'wer	900.	1-6	32	10	Boyd	Nov.	14	1912		1243
Niobrara river	Bennett, Sadie C.	Omaha	Mettlen Ditch	Irrig.	5.	4	28	54	Sioux	Dec.	18	1912		1248
Niobrara river	Bennett, Sadie C.	Omaha	Bennett Ditch	Irrig.	4.	1	28	54	Sioux	Dec.	18	1912		1249
Niobrara river	Hitshew, Geo.	Marsland	Geo. Hitshew Ditch	Irrig.	6.	6	28	52	Box Butte	Feb.	17	1913		1260
Niobrara river	S. B. Coffee Estate	Harrison	Coffee Ditch No. 3	Irrig.		15	29	56	Sioux	March	24	1914		1362*
Pine creek	Clark, Jas.	Rushville	Pine Creek Mill	P'wer	32.	33	30	44	Sheridan	June	5	1893	415	
Plum creek	Plum Creek Irr. Co.	Johnstown	Johnstown Ditch	Irrig.	26.	4	29	24	Brown	Dec.	18	1894	405	
Plum creek	Wilbert, R.	Ainsworth	Wilbert Ditch	Irrig.	.43	35	32	23	Brown	May	5	1896		829
Plum creek	Ainsworth L. & P. Co.	Ainsworth	Plum Creek Plant	P'wer	150.	29	32	22	Brown	May	15	1909		947

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-C—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Pole creek	Julian, A. R., et al	Gordon	Pole Creek Ditch	Irrig.	.57	28	32	40	Cherry	June	29	1905		799
Rickman creek	Byington, W. W.	Springview	Byington Ditch	Irrig.	1.	22	32	20	Keya Paha	May	19	1891	582	
Rock creek	Eastlick, B. J.	Carns	Necessity Ditch	Irrig.	.35	29	32	18	Rock	Jan.	17	1895	395	
Rock creek	Wile, H.	Marlaville	Wile's Ditch	Irrig.	.86	9	31	18	Rock	April	3	1895	397	
Rock Spgs Ck	Moore, W. S.	Meadville	Moore's Ditch	Irrig.	1.43	12	32	22	Keya Paha	June	30	1887	593	
Rock Spgs Ck	Van Koten, J.	Springview	Van Koten Ditch	Irrig.	.07	25	33	22	Keya Paha	Jan.	1	1895	619	
Shobe Br	Lamb, A. J.	Spencer		Irrig.	.14	30	33	11	Holt	July	6	1896		329
Snake river	Jackson, W. S.	Valentine	Snake Hydro Elec. Co.	P'wer		9	31	30	Cherry	Feb.	16	1914		1352*
Spring creek	Kuskie, A. K.	Sparks	Garden Ditch	Irrig.	.08	27	34	23	Cherry	March	30	1900		955
Springs	Bakewell, Geo. C.	Johnstown	Glen Cove Ditch	Irrig.	.85	26	33	24	Brown	Mar.	1	1911		1067
Str., no name	Grant, C. G.	Winfield	Grant Ditch	Irrig.	.14	4	31	20	Rock	Jan.	1	1895	400	
Str., no name	Conger, C. K.	Norden	Conger Ditch	Irrig.	.11	5	33	24	Keya Paha	Sept.	16	1895		158
Snider creek	Pickler, W. S.	Springview	Olds Ditch	Irrig.	.01	31	33	19	Keya Paha	May	1	1894	607	
Spotted Tail C.	Rhodes, J. G.	McLean	Spotted Tail Ditch	Irrig.	.07	4	34	17	Keya Paha	May	17	1893	601	
Sweeney canyon	Hornback, J.	Sparks	Canon Canal	Irrig.	.21	29	31	25	Cherry	Aug.	10	1893	414	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-C—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Turkey creek	La Rue, Chas.	Norden	Turkey Creek Ditch	Irrig.	.43	35	33	23	Keya Paha	Feb.	9	1900		530
Turkey creek	La Rue, Chas.	Norden	Turkey Creek D. No. 2	Irrig.	2.	35	33	23	Keya Paha	May	11	1904		754
Verdigris Ck	Hanson, J. W.	Em'tbg, Ia.	Drayton Ditch	Irrig.	2.86	8	28	8	Antelope	Aug.	11	1894	248	
Whistle creek	Miller, W. K.	Alliance	Home Ditch	Irrig.	.86	13	28	54	Sioux	June	6	1895		65
Whistle creek	Watson, Mat.	Canton	Whistle Creek Ditch	Irrig.	1.	12	28	54	Sioux	June	28	1895		58
Willow creek	Hollibough, C. G.	Marsland	Hollibough Ditch	Irrig.	.16	10	29	50	Dawes	April	20	1908		898
Wooden Sp. Br.	Rhodes, F. J.	Springview	Rhodes Ditch	Irrig.	.21	25	35	20	Keya Paha	June	19	1899		512
Wooden Sp. Br.	Rhodes, F. J.	Springview	Rhodes Ditch	Irrig.	.14	25	35	20	Keya Paha	March	12	1900		544
Wyman creek	McCully, R. A.	Carns	McCully Ditch	Irrig.	.80	19	32	19	Keya Paha	June	10	1891	604	
Wyman creek	Horton, I.	Carns	Horton Ditch	Irrig.	.14	17	32	19	Keya Paha	June	5	1894	587	
Young creek	Lamb, A. J.	Spencer	Harvey & Lamb Ditch	Irrig.	.21	32	33	11	Holt	June	13	1896		511

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Ash creek	Compton, W. L.	Whitney		Irrig.	.03	12	32	51	Dawes	July	15	1893	455	
Ash creek	Connell, W. D.	Whitney	Connell Ditch	Irrig.	.63	6	32	50	Dawes	June	17	1898		459
Ash creek	Cripps, M. A.	Whitney	Cripps Ditch	Irrig.	1.	13	32	51	Dawes	Jan.	10	1899		491
Ash creek	Cripps, Minerva A.	Whitney	Cripps Ditch No. 2	Irrig.	1.14	13	32	51	Dawes	Dec.	26	1903		735
Ash creek	Howard, W. C.	Whitney	Cripps Ditch	Irrig.	.57	13	32	51	Dawes	Aug.	27	1906		835
Ash Ck. E. Br.	Tomlin, H. B.	Whitney	Ox Yoke Ditch	Irrig.	2.86	31	32	50	Dawes	May	31	1880	447	
Ash Ck. E. Br.	Aird, Ida L.	Crawford	Barron Ditch	Irrig.	1.14	32	32	50	Dawes	July	1	1888	438	
Ash Ck. E. Br.	Ivins, Orville R.	Crawford	Sheldon Ditch	Irrig.	1.43	30	32	50	Dawes	Jan.	26	1899		493
Ash Ck. E. Br.	Todd, Frank P.	Crawford	Todd Ditch	Irrig.	.38	5	31	50	Dawes	Sept.	12	1899		520
Ash Ck., E. Br.	Stumph, Nellie	Crawford	Stumph Ditch	Irrig.		31	32	50	Dawes				1023½*	
Ash Ck., W. Br.	Vetter, Andrew	Crawford	Mace Ditch	Irrig.	1.	2	31	51	Dawes	July	31	1884	428	
Ash Ck., W. Br.	Wall, O. W.	Crawford	W. Ash. C. I. Co. D.	Irrig.	1.62	36	32	51	Dawes	July	4	1893	452	
Ash Ck., W. Br.	Ivins, Orville R.	Crawford	Woodard Ditch	Irrig.	.14	25	32	51	Dawes	Feb.	3	1898		434
Ash Ck., W. Br.	Broadhurst, Nathan	Crawford	Broadhurst Res.	Stor.	5.	35	32	51	Dawes	Nov.	17	1913		1333
Beaver creek	Braddock, Wm.	Chadron	Braddock Ditch	Irrig.	.36	18	31	46	Sheridan	April	15	1895	423	
Beaver creek	Braddock, J. F.	Chadron		Irrig.	.04	1	31	47	Dawes	April	15	1895	974	
Beaver creek	The Ravenna Mills	Ravenna	The Ravenna Mills	P'wer		8	12	14	Buffalo				1037*	
Beaver creek	Braddock, Wm.	Chadron	Wm. Lockler Ditch	Irrig.		34	35	47	Dawes				1017	
Beaver creek	Stastney, F.	Chadron	Stastney Ditch	Irrig.	.36	4	33	48	Sheridan	July	30	1895		330
Beaver creek	Braddock, I. F.	Chadron	Braddock	Irrig.	.6	1	34	37	Dawes	Dec.	3	1900		463
Beaver creek	U. R. Land & Cattle Co.	Chadron	Cilek Ditch	Irrig.	.36	4	33	46	Sheridan	June	19	1899		513
Beaver creek	Rickman, A. W.	Chadron	Rickman Ditch	Irrig.	1.	9	33	46	Sheridan	July	2	1902		681
Bordeaux creek	Locket, T. E.	Chadron	Locket Ditch	Irrig.	.07	11	32	48	Dawes	June	30	1886	494	
Bordeaux creek	Naylor, W. W.	Chadron	Richards Ditch	Irrig.	.14	36	33	48	Dawes	Sept.	10	1890	430	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Bordeaux creek	Bryant, S. A.	Chadron	Bryant's Ditch	Irrig.	.29	14	33	48	Dawes	Feb.	4	1891	434	
Bordeaux creek	Lecher, Peter	Chadron	Hall's Ditch	Irrig.	.07	15	33	48	Dawes	March	1	1891	437	
Bordeaux creek	Naylor, W. W.	Chadron	Richards Ditch	Irrig.	.36	36	33	48	Dawes	Sept.	7	1892	446	
Bordeaux creek	Mann, Wm.	Chadron	Mann's Ditch	Irrig.	.23	25	33	48	Dawes	Dec.	31	1892	975	
Bordeaux creek	Adams, S. L.	Chadron	Adams Ditch	Irrig.	.14	2	32	48	Dawes	March	5	1893	450	
Bordeaux creek	County of Dawes	Chadron	County Ditch	Irrig.	.14	23	33	48	Dawes	July	31	1893	983	
Bordeaux creek	Hebard, K. M.	Chadron	Bacon Ditch	Irrig.	.21	21	34	48	Dawes	July	1	1894	445	
Bordeaux creek	Morrisey, M.	Chadron	Morrissey Canal	Irrig.	.08	15	33	48	Dawes	Aug.	25	1894	491	
Bordeaux creek	O'Donnell, John	Chadron	O'Donnell's Ditch	Irrig	.14	9	31	48	Dawes	Jan.	1	1898		432
Bordeaux creek	Nelson, P. B.	Chadron	Nelson's Ditch	Irrig	.36	14	33	48	Dawes	Oct.	1	898		478
Bordeaux creek	Nelson, P. B.	Chadron	Nelson's Irr. Plant	Irrig.	.14	14	33	48	Dawes	Jan.	2	899		494
Bordeaux creek	Naylor, Chas.	Chadron	Burns Ditch	Irrig.	4.3	36	33	48	Dawes	Nov.	5	1900		584
Bordeaux creek	Martens, Wm.	Chadron	Martens Ditch	Irrig.	.57	28	34	48	Dawes	Sept.	23	1902		690
Bordeaux creek	Martens, Wm.	Chadron	Martens Ditch	Irrig.	1.14	21	34	48	Dawes	Jan.	14	1907		848
Bordeaux, Lit	Hartzell, S.	Chadron	Hartzell Canal	Irrig.	.57	13	33	48	Dawes	June	1	1893	448	
Bordeaux, Lit	Butler, J. A.	Chadron	Butler Ditch	Irrig.	.11	33	33	47	Dawes	June	1	1894	443	
Bordeaux, Lit	Frady, C. H.	Chadron	Frady Ditch	Irrig.		30	33	47	Dawes				*1009	
Bordeaux, Lit	Collin, Jacob	Chadron	Collins Res.	Irrig.	.31	14	32	48	Dawes	Feb.	27	1905		780
Bordeaux, Lit	Good, J. W.	Chadron	Good Ditch	Irrig.	7.	29	33	47	Dawes	March	6	1905		782
Bull creek	Johnson, W. S.	Glen	Johnson Ditch No. 1	Irrig.	.29	7	30	53	Sioux	March	13	1895	519	
Cedar Canyon	Pelren, J. E.	Crawford	Cedar Canon Ditch	Irrig.	.43	16	33	53	Sioux	March	1	1897		330
Chadron creek	City of Chadron	Chadron	Chadron Water Works	W. S	1.	18	32	48	Dawes	Dec.	31	1888	1022	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Chadron creek	Gallup, W. S.	Chadron	Gallup's Ditch	Irrig.	.08	15	33	49	Dawes	Dec.	20	1890	426	
Chadron creek	Wilson, H. M.	Chadron	Fug Wilson Ditch	Irrig.	.20	12	32	49	Dawes	July	13	1893	453	
Chadron creek	Wilson, W. W.	Chadron	Wallace Wilson Ditch	Irrig.	.07	12	32	49	Dawes	July	14	1893	454	
Chadron creek	Record, A. A.	Hyannis	Half Diamond E. D.	Irrig.	.57	1	32	49	Dawes	June	17	1894	468	
Charcoal Ck	Weber, M. J.	Glen	Klein Ditch	Irrig.	.11	33	31	53	Sioux	Aug.	1	1882	982	
Cottonwood Ck	Glendy, W. K.	Whitney	Rasmussen Ditch	Irrig.	2.29	10	33	52	Dawes	March	8	1898		444
Cottonwood	Glendy, W. K.	Whitney	Rasmussen Ditch	Irrig.	18.	10	33	52	Dawes	Dec.	26	1899		528
Rav.t'b. C't'd ck	Carlson, A. A.	Crawford	Carlson Ditch	Irrig.	.71	21	33	52	Dawes	Sept.	20	1897		409
Cottonwood Lit	Golden, T. F.	Crawford	Thos. Stuart Ditch	Irrig.	.33	8	32	52	Dawes	Dec.	21	1890	425	
Cottonwood Lit	Price, J. A. B., Golden, T. F.	Crawford	Stuart Bros. Ditch	Irrig.	2.86	8	32	52	Dawes	June	10	1895		8
Cottonwood Lit	Kusel, Wm. T.	Chadron	Kusel Ditch	Irrig.	1.14	9	32	51	Dawes	Oct.	16	1895		183
Cottonwood Lit	Simmons, Raner	Crawford	Simmons Ditch	Irrig.	1.14	9	32	51	Dawes	Sept.	12	1899		521
Cottonwood Lit	Kusel, Wm. T.	Chadron	Kusel Ditch No. 2	Irrig.	.43	8	32	51	Dawes	May	19	1900		560
Cottonwood Lit	Dunn, J. G.	Crawford	Dunn's Ditch	Irrig.	1.43	9	32	52	Dawes	Jan.	14	1902		649
Cottonwood Lit	Erikson, Jno. R.	Crawford	Stewart & Maple Ditch	Irrig.	.29	8	32	52	Dawes	March	10	1902		656
Cottonwood Lit	Kusel, Wm. T.	Chadron	Kusel & Spear'n Ditch	Irrig.	.71	8	32	51	Dawes	June	30	1902		677
Cottonwood Lit	Broadhurst, Herb	Crawford	Broadhurst Ditch	Irrig.	3.2	7	32	51	Dawes	Feb.	25	1913		1264
Cottonwood, little	Dodd & McDowell	Crawford	Dodd & McDowell Ditch	Stor.	10.	18	32	5	Sioux	April	15	1913		1276
Dead Horse Ck	Kemery, John	Chadron		Irrig.	.01	32	32	49	Dawes	Sept.	1	1890	493	
Dead Horse Ck	Woodruff, F. B. & E. F	Chadron	Flag Butte Ditch	Irrig.	.03	32	32	49	Dawes	April	10	1891	427	
Dead Horse Ck	Goff, L. L.	Chadron	Goff Ditch	Irrig.	.17	9	31	49	Dawes	Aug.	27	1893	457	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Dead Horse Ck	Harley, James	Chadron		Irrig.	.01	32	32	49	Dawes	Aug.	1	1894	488	
Dead Horse Ck	Goff, L. L.	Chadron	Goff Ditch	Irrig.		4	31	49	Dawes					7
Dead Horse Ck	Geiser, B. A.	Chadron	Geiser Ditch	Irrig.	.55	17	32	49	Dawes	Mar.	18	1902		658
Dead Horse Ck	Slatttery, Roy A.	Chadron		Irrig.	1.29	32	33	49	Dawes	April	6	1904		749
Deadman Ck	Phillips, W. S.	Crawford	Stewart Ditch	Irrig.	.21	19	30	52	Dawes	May	8	1896		334
Deadman Ck	Phillips, W. S.	Crawford	Phillips Ditch	Irrig.	.14	18	30	52	Dawes	March	19	1900		547
Deadman Ck	Glendy, Wm. K.	Crawford	P. & R. Ras. Ditch	Irrig.	1.43	1	30	53	Sioux	May	29	1900		562
Deadman Ck	Linderman, Con.	Crawford	Linderman Ditch	Irrig.	.14	18	30	52	Dawes	June	11	1900		564
Deep creek	Green, M. H.	Lynch	Deep Creek Ditch	Irrig.	.05	9	30	53	Sioux	May	1	1895	525	
Deep creek	McMasters, Wm. A.	Glen	Green Ditch	Irrig.	.20	9	30	53	Sioux	Oct.	5	1895		203
Dry Run	Campbell, F. J.	Chadron	Campbell Ditch	Irrig.	1.	35	34	49	Dawes	Nov.	9	1908		919
Dry Run	Guse, William	Crawford	William Guse Res	Stor.	20.	35	34	52	Dawes	Jan.	13	1914		1345
Dry Run	Harsh & Weston	Crawford	Harsh & Weston Ditch	Irrig.	3.	31	34	51	Dawes	March	11	1914		1361
Dry Draw	Earnest, Geo. A.	Chadron	G. Earnest Ditch	Irrig.	3.71	22	35	49	Dawes	Feb.	20	1911		1061
English creek	McDowell, E. C.	Crawford	McDowel Stor. Sys.	Irrig.	.87	12	31	52	Dawes	Oct.	21	1901		772
Flood Waters	Lenehan, Delia	Crawford	Lenehan Res	Stor.	4.	25	34	52	Dawes	April	16	1913		1278
Flood Waters	Arner, Jesse B.	Crawford	Arner Ditch	Irrig.	.14	27	33	53	Sioux	May	6	1913		1289
Hooker creek	Uhlig, Max	Glen	McMannis Ditch	Irrig.	1.	7	31	51	Dawes	Dec.	31	1889	492	
Hooker creek	Sheldon, O. E.	Crawford	Alcorn Ditch	Irrig.	1.21	31	32	51	Dawes	Nov.	17	1905		803
Hooker creek	Souther, Mable G.	Crawford	Souther Lake	F. & I.	1.43	30	32	51	Dawes	Sept.	24	1908		915

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Indian creek	Seegrist, Isaac	Crawford	Seegrist Ditch	Irrig.	.03	3	31	50	Dawes	Nov.	1	1893	489	
Indian creek	Flood, M. F.	Crawford	Flood Ditch	Irrig.	.07	33	32	50	Dawes	Feb.	13	1894	460	
Indian creek	Boyer, F.	Whitney	Boyer Ditch	Irrig.	.86	28	32	50	Dawes	April	30	1900		559
Indian Ck. trib	Kaiser, Omar A.	Whitney	Kaiser Ditch	Irrig.	.57	28	32	50	Dawes	Feb.	15	1900		540
Indian creek trib.	Honnold Bros.	Whitney	Honnold-Wilson Ditch	Irrig.	.71	3	31	50	Dawes	May	25	1912		1199
Kyle creek	Colville, David	Glen	Kyle Creek Ditch	Irrig.	.57	3	30	54	Sioux	June	30	1882	522	
Lone Tree, S. Fk.	Thomas, J. C.	Whitney	Thomas Ditch	Irrig.	1.	28	34	51	Dawes	April	29	1905		789
Madden creek	Flannigan, F.	Chadron	Dams	Irrig.	.57	26	35	49	Dawes	July	11	1904		763
Madden creek	Trier, Phillip	Provo, S. D.	Trier Ditch	Irrig.	1.21	6	34	48	Dawes	Aug.	1	1906		830
Madden and North creeks	Flannigan, O. R.	Chadron	Dams	Irrig.	.57	31	35	48	Dawes	Oct.	17	1904		771
Rush creek	Braddock, H. T.	Chadron	Braddock Ditch	Irrig.	3.	10	34	49	Dawes	May	4	1903		706
Rush creek	Braddock, H. T.	Chadron	Braddock Ditch Exten.	Irrig.	1.57	11	34	49	Dawes	May	31	1906		825
Sand creek, trib to L. Cotton'd.	Metz, Scott	Crawford	Bendix Ditch	Irrig.	.57	35	33	53	Sioux	Nov.	19	1895		189
to L. Cotton'd.	Carlson & Rasmussen	Crawford	C. &R. Sand Creek D.	Irrig.	30.	22	33	52	Dawes	Sept.	12	1904		767
Sand creek, trib. to L. Cotton'd	Arner, J. & H.	Crawford	Arner Ditch	Irrig.	2.59	26	33	53	Sioux	Jan.	12	1905		779

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Sand creek, trib. to L. Cotton'd	Rasmussen, K.	Whitney	Rasmussen Ditch	Irrig.	17.	3	32	52	Dawes	Jan.	8	1906		811
Sand creek, trib. to L. Cotton'd	Dunn, John G.	Crawford	Syndicate Ditch	Irrig.	27.42	32	33	52	Dawes	April	2	1912		1190
Draw, trib. of Sand creek	Jordon, M. D.	Adelia	Jordon Ditch	Irrig.	.50	31	33	53	Sioux	April	2	1900		551
Saw Log, East	Stewart, H. E.	Crawford	Little Saw Log Ditch	Irrig.	.71	12	30	52	Dawes	Jan.	23	1907		849
Saw Log, East	Stephenson, Chas.	Crawford	Stephenson Ditch	Irrig.	1.14	25	31	52	Dawes	March	5	1907		852
Saw Log, East	Baker, A. D.	Crawford	Baker Ditches	Irrig.	.29	5	30	51	Dawes	Jan.	13	1908		884
Saw Log, East	Van Treek, P. H.	Crawford	Van Treek Canal & Ponds	Irrig.	.37	4	30	51	Dawes	May	8	1911		1098
Sheridan creek	Getchell, G. C.	Pine Ridge	Getchell Ditch	Irrig.	.07	27	34	45	Sheridan	Aug.	1	1894	418	
Soldier creek	Rodgers, J. J.	Crawford	Rodgers Ditch	Irrig.	.14	5	31	53	Sioux	April	30	1883	546	
Soldier creek	Swanson, Geo.	Crawford	Swanson Ditch	Irrig.	1.43	4	31	53	Sioux	March	25	1905		786
Spring Br. trib. White river	Tucker, J. S.	Glen	Tucker Ditch	Irrig.	.17	34	31	54	Sioux	June	1	1883	557	
Spring creek	Swinbank, Sam'l	Crawford	Moszeter Ditch	Irrig.		13	32	52	Dawes				*1014	
Spring creek	Forbes, J. D.	Crawford	Forbes Ditch No. 1	Irrig.	.57	20	32	52	Dawes	April	28	1902		663
Spring creek	Wolff, Ferdinand	Crawford	Wolff Ditch	Irrig.	1.71	21	32	52	Dawes	Jan.	15	1904		739
Spring creek	Swinbank, Sam'l	Crawford	Swinbank Res.	Stor.	2.	13	32	52	Dawes	March	3	1914		1358
Spg. ck, trib. of Lit. Cottn'd	Pinney, B. G.	Crawford	Spring Creek Ditch	Irrig.	.86	13	32	52	Dawes	May	10	1894	466	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lit. Cottn'd	Balser, R.	Lusk, Wyo.	Spring Creek Ditch No.1	Irrig.	2.	7	32	51	Dawes	Dec.	1	1894	473	
Lit. Cottn'd	Broadhurst, N. & H.	Crawford	Spring Creek Ditch No.1	Irrig.	2.28	13	32	52	Dawes	April	7	1905		788
Spgs. trib. to D. Horse creek	Goff, T. L.	Chadron	Goff Ditch	Irrig.	.14	30	32	49	Dawes	April	2	1891	441	
Squaw creek	Daniels & Stetson	Crawford	Daniels & Stetson Ditch	Irrig.	.29	19	31	51	Dawes	June	17	1895		27
Squaw creek	Cooper, Wm.	Crawford	Cooper Ditch	Irrig.	2.29	36	32	52	Dawes	May	8	1896		333
Squaw creek	McDowell, E. C.	Crawford	Squaw Creek	Stor.	3.	12	31	52	Dawes	Oct.	3	1911		1132
Trunk Butte C.	Smock, M.	Whitney	Smock's Ditch	Irrig.	.07	26	32	50	Dawes	June	28	1895	465	
Trunk Butte C.	Snyder, Frank W.	Whitney	Snyder's Ditch	Irrig.		14	32	50	Dawes	May	5	1914		1368*
W. Clay Ck	Davidson, J. E.	Crawford	McFarland Ditch	Irrig.	1.64	35	32	52	Dawes	May	18	1891	960	
W. Clay Ck	Hazleton, Wm. S.	Crawford	Hazleton Ditch	Irrig.	1.14	13	31	52	Dawes	May	15	1894	475	
W. Clay Ck	White River Irr. Co.	Crawford	White River Ditch	Irrig.	8.71	35	32	52	Dawes	Dec.	31	1894	477	
				P'wer	1.	35	32	52	Dawes	Dec.	31	1891		
W. Clay Ck	Cooper, Wm.	Crawford	Cooper Ditch	Irrig.	3.71	2	31	52	Dawes	June	22	1895		42
W. Clay Ck	Brockway, Horace	Crawford	Brockway Ditch	Irrig.	.71	36	31	52	Dawes	Feb.	27	1896		256
W. Clay Ck	Pine Ridge Ind. Ag.	P. Ridge I. Ag., S. D.	Pine Ridge Irr. Ditch	Irrig.					Sheridan				*419	
W. Clay Ck	Adams, Geo. M.	Crawford	Rincker Ditch	Irrig.	.57	11	31	52	Dawes	June	8	1901		618
W. Clay Ck	Hutzel, John C.	Rushville	Hutzel Ditch	Irrig.	.57	13	31	52	Dawes	April	30	1903		704
White Clay creek	Brooks, J. N.	Rushville	Brooks Ditch	Irrig.	.42	36	35	45	Sheridan	Aug.	2	1911		1120
White Clay creek	Townsend, Charles	White Clay	Townsend Ditch	Irrig.	.80	25	35	45	Sheridan	Jan.	21	1911		1054
W Clay, E. Br	Stewart, H. E.	Crawford	Little Saw Log Ditch	Irrig.	.71	12	30	52	Dawes	Jan.	23	1907		849

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
W. Clay and Squaw creek	White River Irr. Co.	Crawford	White River Irr.	Irrig.	8.	36	32	52	Dawes	March	3	1902		655
White River	Jacobson, M.	Glen	Jacobson Ditch	Irrig.	.14	32	31	53	Sioux	Oct.	1	1882	561	
White River	Hall, Leroy	Crawford	Hall's Mill	P'wer	26.4	34	32	52	Dawes	Jan.	10	1885	478a	
White River	Diedrickson, N.	Glen	Diedrickson Ditch	Irrig.	.21	1	30	54	Sioux	Sept.	1	1890	562	
White River	Pinney, B. G., et al	Crawford	Harris & Cooper Ditch	Irrig.	16.78	25	32	52	Dawes	March	9	1894	464	
White River	Pinney, B. G., et al	Crawford	Harris & Cooper Ditch	Irrig.	1.57	25	32	52	Dawes	June	15	1894		
White River	Pinney, B. G., et al	Crawford	Harris & Cooper Ditch	Irrig.	.28	25	32	52	Dawes	Oct.	31	1894		
White River	Rasher, Mrs. E. L.	Crawford	Rasher Ditch	Irrig.	1.14	19	32	51	Dawes	June	20	1894	467	
White River	Welling, Chas.	Crawford	Welling Ditch	Irrig.	.57	17	32	51	Dawes	July	13	1894	469	
White River	Carpenter, E. J. & Co.	Whitney	Carpenter Ditch	Irrig.	2.86	1	32	51	Dawes	Dec.	2	1894	487	
White River	White River Irr. Co.	Crawford	White R. Irr. Co. Ditch	I.&P	8.71	35	32	52	Dawes	Dec.	31	1894	477	
White River	Hall, Leroy	Crawford	Halls' Ditch No. 2.	Irrig.	24.83	34	32	52	Dawes	Sept.	10	1895	478c	
White River	Crawford Co.	Crawford	Crawford Citizens Canal	Irrig.	58.	23	31	53	Sioux	Feb.	13	1895	501 444	
White River	Schwartz, E.	Andrews	Hughson Ditch	Irrig.	.07	26	31	55	Sioux	March	15	1895	520	
White River	Butterworth, J.	Crawford	Butterworth Ditch	Irrig.	.07	3	31	52	Dawes	May	7	1895	490	
White river	City of Crawford	Crawford	Crawford Water Sys.	City		32	32	52	Dawes				1026*	
White river	Chicago Bur. & Q. R. R. Co.	Lincoln	C. B. & Q. Pipe Line at Crawford	ID&P		3	31	52	Dawes				1030	*
Seepage near White River	Mason, J. F.	Glen	Mason Ditch	Irrig.	.14	32	31	53	Sioux	May	12	1896		337

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
White River	Clarke, D. J.	Andrews	Lewis Ditch	Irrig.	.14	27	31	55	Sioux	May	19	1896		340
White River	Bartlett, A. M.	Chadron	Chadron Ditch	Irrig.	.71	18	34	48	Dawes	May	21	1897		391
White River	Schwabe, Lena	Chadron	Schwabe Ditch	Irrig.	1.14	25	34	49	Dawes	June	24	1897		394
White River	Wilkinson, Thos.	Crawford	Wilkinson Ditch	Irrig.	.71	24	32	52	Dawes	Nov.	18	1897		421
White River	Wright, Frank	Whitney	Sandy Stewart Ditch	Irrig.	.94	10	32	51	Dawes	Jan.	8	1898		427
White River	Forbes, Jeanette, et al	Crawford	Rasher Ditch	Irrig.	.50	19	32	51	Dawes	May	23	1898		456
White River	Zurn, Adam	Crawford	Zurn & Schmeizle Ditch	Irrig.	1.	19	32	51	Dawes	Oct.	13	1898		475
White River	Mecham, S. R., et al	Whitney	Mecham Ditch	Irrig.	2.86	17	32	51	Dawes	March	15	1899		500
White River	Shaefer, Geo.	Whitney	Shaeffer & Blust Ditch	Irrig.	3.	10	32	51	Dawes	Dec.	18	1899		525
White River	Rasher, Frank	Crawford	Rasher Ditch	Irrig.	1.43	19	32	51	Dawes	Jan.	16	1900		534
White River	Carlson, John	Whitney	Carlson Ditch	Irrig.	1.43	6	32	50	Dawes	Nov.	26	1900		588
White River	Village of Crawford	Crawford	Crawford Pump Station	P'wer	18.	3	31	52	Dawes	March	30	1903		702
White River	Hebbert, Wm. S.	Whitney	Hebbert Irr. Ditch	Irrig.	.29	34	33	50	Dawes	May	11	1903		707
White River	Nance & Simmons Irr. Co.	Whitney	S. H. Irr. Co. Ditch	Irrig.	1.	16	32	51	Dawes	Oct.	26	1903		730
White River	Peterson, Chas. R.	Crawford	Ext. to C. Rasher Ditch	Irrig.	1.27	20	32	51	Dawes	Feb.	5	1904		740
White River	Schwabe, August	Chadron	Schwabe Ditch	Irrig.	.57	24	34	49	Dawes	June	13	1904		758
White River	Schwabe, August	Chadron	Schwabe Power Plant	P'wer	5.	24	34	49	Dawes	June	13	1904		759
White River	Wright Bros.	Whitney	Wright's Ditch	Irrig.	4.	16	32	51	Dawes	Dec.	5	1904		775
White River	Schwabe, Aug.	Chadron	Schwabe Ditch	Irrig.	.26	24	34	49	Dawes	March	19	1906		815
White River	Roby, I. M.	Crawford	Roby Ditch	Irrig.	.33	13	31	52	Dawes	Sept.	13	1906		838
White River	Stephenson, Ira J.	Crawford	Stephenson Power Plant	P'wer	15.	34	31	53	Sioux	March	15	1907		854
White river	White River Irr. Co.	Crawford	White River Irr. Co.'s S. Br.	Irrig.	1.43	25	32	52	Dawes	March	11	1909		936
White River	Schwabe, August	Chadron	Schwabe Canal	Irrig.	3.43	31	34	48	Dawes	July	23	1908		908
White river	Jenson, J. L.	Whitney	Jenson Irr. Plant	Irrig.	1.14	26	33	50	Dawes	June	27	1911		1110

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
White river	Pinney, B. G. & Denslow, J. H	Crawford	Pinney & Denslow Res. 1-2-3	I.&S.	20	26	32	52	Dawes	Aug.	10	1911		1122
White river	Forbes, Wm. T	Crawford	Forbes Extension	Irrig.	.85	19	32	51	Dawes	Sept.	26	1911		1123
White river	Hebbert, W. S.	Chadron	Hebbert Ditch	Irrig.	.71	34	33	50	Dawes	March	10	1914		1360
White river	Kusel, Wm. T.	Chadron	Kusel White River Ditch	Irrig.		10	32	17	Dawes	May	5	1914		1367*
Canons' trib to White River	Martens, Wm	Chadron	Marten's Ditch	Irrig.	.29	14	34	48	Dawes	Dec.	26	1902		696
White River	Jones, Sarah M.	Crawford	Jones Ditch	Irrig.	.29	9	31	51	Dawes	May	20	1907		860

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-E—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Antelope creek	Turner, S. A.	Harrison	Turner Ditch	Irrig.	.86	26	34	57	Sioux	Oct.	31	1894	537	
Antelope creek	Seaman, S. R.	Warren, Wyo.	Ellis Ditch	Irrig.	.29	9	33	57	Sioux	May	17	1896		338
Antelope creek	Gayhart, M. J.	Montrose	Gayhart Ditch	Irrig.	2.43	16	34	55	Sioux	June	18	1904		760
Antelope creek N. Br	Story, S. R.	Story	Story's Ditch	Irrig.	2.	8	34	56	Sioux	Nov.	11	1895		168
Boggy creek	Holly, Thos.	Crawford		Irrig.	.11	30	33	54	Sioux	Dec.	31	1888	956	
Boggy creek	Smith, J. W.	Harrison	Smith's Ditch	Irrig.	.20	31	33	54	Sioux	May	1	1892	526	
Boggy creek	Wickersham, H.	Harrison	Witchersham Ditch	Irrig.	3.	31	33	54	Sioux	Feb.	28	1903		701
Boggy ck., Mid Br	Bannon, J. F.	Harrison	Bannon's Ditch	Irrig.	.06	7	32	54	Sioux	July	1	1886	560	
Boggy ck., Mid Br	Marten, Wm.	Harrison	Martin's Ditch	Irrig.	.36	18	32	54	Sioux	May	19	1896		342
Boggy ck., Mid Br	Hill, Albert F.	Harrison	Hill Irrigation Ditch	Irrig.	.86	11	32	55	Sioux	Jan.	20	1908		886
Cedar creek	Schiltz, C. E.	Harrison	Schilt's C. Creek Ditch	Irrig.	.57	35	33	56	Sioux	May	15	1885	507	
Cedar creek	Valdez, M.	Harrison	Valdez Ditch	Irrig.	.50	10	32	56	Sioux	April	5	1886	976	
Cedar creek	Plunkett, John	Harrison		Irrig.		4	32	56	Sioux				985	*
Cherry creek	Ruffing, M.	Harrison	Cherry Creek Ditch	Irrig.	.03	29	33	54	Sioux	May	1	1893	549	553a
Dry gulches	Childs, Roy C.	Story	Roy C. Child's Ditch	Irrig.		28	34	56	Sioux	Aug.	18	1914		1376*
Hat creek	Brewster, B. E.	Harrison	W. Hat Creek Ditch	Irrig.	.43	16	32	55	Sioux	June	1	1880	553a	
Hat creek	Coffee, Chas. F.	Harrison	C. F. Coffee Ditch	Irrig.	4.29	26	33	55	Sioux	Sept.	1	1881	512	
Hat creek	Brewster, B. E.	Harrison	W. Hat Creek Ditch	Irrig.	.57	16	32	55	Sioux	May	31	1886	553b	
Hat creek	Coffee, J. T.	Harrison	Miller Ditch	Irrig.	.37	23	33	55	Sioux	May	19	1896		
Hat creek	Haas, Peter	Harrison	Haas Ditch	Irrig.	.08	2	33	55	Sioux	May	8	1899		510
Hat creek	Lyon, E. B.	Harrison	Antrim's Ditch	Irrig.	.57	3	32	55	Sioux	Dec.	24	1900		594

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-E—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Hat creek	Lyon, E. B.	Harrison	Antrim Dam	Irrig.	.57	3	32	55	Sioux	Aug.	20	1906		834
Hat creek	Coffee, Jno. T.	Harrison	Coffee & Son Fld. W. D.	Irrig.	6.	14	33	55	Sioux	Oct.	22	1912		1236
Canon trib. to Hat creek	Konrath, Jos.	Montrose	Konrath Ditch	Irrig.	1.43	17	34	54	Sioux	Dec.	28	1905		808
Draw trib. to Indian creek	Meier, Aug.	Andmore, S. Dakota	Meier Dam	Irrig.	2.	24	35	55	Sioux	Nov.	5	1900		585
Draw trib. to Indian creek	Hibbeln, Jno.	Ardmore, S. Dakota	Hibbeln Ditch	Irrig.	2.	24	35	56	Sioux	Oct.	4	1907		872
Jim creek	Dout, L.	Harrison	Dout Bros. Ditch	Irrig.	.86	7	33	56	Sioux	May	15	1889	981	
Jim creek	Anderson, Nels.	Harrison	Jim Creek Ditch	Irrig.	.43	8	33	56	Sioux	Dec.	15	1890	502	
Jim creek	Slattery, Wm.	Harrison	Slattery Ditch	Irrig.	.29	13	33	57	Sioux	May	31	1891	543	
Jim Creek	Hunter, H. C.	Adelia	Hunter Ditch	Irrig.	.03	26	33	54	Sioux	May	12	1898		451
Jim C. E. Fork	Wassenberger, J.	Montrose	Wassenberger Ditch		2.29	29	34	54	Sioux	Oct.	13	1900		581
Little Red ck	Zerbst, R.	Harrison	Zerbst Ditch	Irrig.	.14	25	33	56	Sioux	May	1	1893	551	
Lickett creek	Coffee, S. B.	Chadron	Lickett Ditch	Irrig.		27	33	54	Sioux				*1005	
Lickett creek	Coffee, S. B.	Chadron	Lickett Ditch	Irrig.	1.43	27	33	54	Sioux	March	21	1900		549
Long Branch	Borky, Sol	Ardmore, S. Dakota	Borky Dam	Irrig.	.64	23	35	54	Sioux	April	19	1900		557
Long Branch	O'Connel, Dennis	Ardmore, S. Dakota	O'Connel Ditch	Irrig.	.20	22	35	54	Sioux	Nov.	10	1900		587

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-E—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Long Branch	Ebert, L. J.	Ardmore, S. Dakota	Ebert Ditch	Irrig.	.14	19	35	53	Sioux	Aug.	22	1901		635
Long Branch	Forster, Jacob	Ardmore, S.D.	Long Br. Res.	Stor.		36	35	54	Sioux	June	15	1914		1371*
Monroe creek	Wilcox, E. J.	Harrison	Big Monroe creek Ditch	Irrig.	1.43	33	33	56	Sioux	May	1	1888	506	
Monroe creek	Schilt, C. E.	Harrison	Schilt's Monroe Creek	Irrig.	.50	27	33	56	Sioux	July	2	1888	509	
Monroe creek	Noreisch, Wm.	Harrison	Noreisch's Ditch	Irrig.	.01	33	33	56	Sioux	July	19	1895		83
Monroe creek	Jordan, C.	Harrison	Neil Jordan Ditch	Irrig.	2.20	13	33	56	Sioux	Nov.	12	1900		841
Monroe creek	Jordan, C.	Montrose	Conelius Jordan	Irrig.		13	33	56	Sioux	July	30	1914		1375
Monroe Creek	Jordan, Richard	Harrison	Wooden Shoe	Stor.		22	33	56	Sioux	Aug.	24	1914		1377*
Prairie Dog Ck.	Schilt, C. E.	Harrison	Schilt's P. Dg. Ditch	Irrig.	1.14	35	33	56	Sioux	May	31	1886	508	
Sow Belly ck.	Schaefer, N. J.	Harrison	Old Sow Belly Ditch	Irrig.	3.	7	32	55	Sioux	June	1	1887	533	
Sow Belly ck.	Montgomery, Sarah	Harrison	Montgomery Ditch	Irrig.	1.	21	33	55	Sioux	Dec.	1	1890	553	
Sow Belly ck.	Jordan, Sarah	Harrison	Jordan Ditch	Irrig.	.43	21	33	55	Sioux	June	1	1895	556	
Sow Belly ck.	Nutto, F.	Harrison	Nuttos Ditch	Irrig.	.43	24	32	56	Sioux	Sept.	4	1897		404
Sow Belly ck.	Jordan, Sarah	Harrison	Jordan Ditch	Irrig.	.50	21	33	55	Sioux	May	11	1898		424
Sow Belly ck.	Carrol, M. J.	Harrison	Carrol Ditch	Irrig.	.14	7	32	55	Sioux	July	12	1899		516
Sow Belly ck.	Zimmerman, W. H.	Harrison	Zimmerman Ditch	Irrig.	.71	34	33	55	Sioux	Jan.	11	1900		532
Sow Belly ck.	Jordan, S.	Harrison	Jordan Ditch	Irrig.	.14	21	33	55	Sioux	May	26	1902		608
Sow Belly creek	Barnes, Paul T.	Harrison	Barnes Res.	Stor.	10.	19	32	55	Sioux	March	24	1913		1268
Sow Belly ck.	O'Connell, M. J.	Montrose	O'Connell Canal	Irrig.		9	33	55	Sioux	May	5	1913		1288*
Spg. ck. trib. to Sow Belly ck.	Hall, W. S. and F. M.	Harrison	Hall's Spring Creek Ditch	Irrig.	.57	6	32	55	Sioux	March	26	1889	550	
Spg. ck. trib. to Sow Belly	Schaefer, N. J.	Harrison	Spring Creek Ditch	Irrig.	.20	7	32	55	Sioux	June	1	1893	532	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-D—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Sp. Br. trib to S. W'rbon'et C	Biehle, Chas	Harrison	Biehle Ditch	Irrig.	.23	32	33	56	Sioux	April	1	1891	538	
Sp. Br. trib to S. W'rbon'et C	Garton, O. A.	Harrison	Garton Ditch	Irrig.	1.43	31	33	56	Sioux	Oct.	16	1893	503	
Sp. Br. trib to N. W'rbonet' C	Kay, J. L.	Harrison	Kay's Ditch	Irrig.	.11	26	33	57	Sioux	May	1	1887	958	
Sp. Br. trib to W'rbon'et C	Nolan, Jas.	Harrison	Nolan Ditch No. 1	Irrig.	.07	23	33	57	Sioux	March	15	1887	957	
Sp. Br. trib. to W'rbon'et C	Nolan, Jas	Harrison	Nolan Ditch No. 2	Irrig.	.29	23	33	57	Sioux	May	1	1888	959	
Squaw creek	Dunn, Thos.	Harrison	Dunn's Ditch	Irrig.	.36	15	33	57	Sioux	June	1	1890	552	
Squaw creek	Hamlin, N. D.	Harrison	Hamlin's Ditch	Irrig.	.01	10	33	57	Sioux	April	1	1891	555	
Squaw creek	Dunn, Thos.	Harrison	Thos. Dunn's Ditch	Irrig.	.57	10	33	57	Sioux	Aug.	5	1895		100
Squaw creek	Dunn, P. D.	Harrison	Phillip Dunn's Ditch	Irrig.	.19	3	33	57	Sioux	Jan.	22	1897		376
Squaw ck., W. Br	Thomas, S. M.	Harrison	Thomas Ditch	Irrig.	.50	10	33	57	Sioux	July	23	1901		627
Stt., no name	Coffee, S. D.	Harrison	Homestead Ditch	Irrig.	.22	22	33	54	Sioux	May	31	1890	984	
Warbonnet ck.	Brewster, B. E.	Harrison	Warbonnet Ditch	Irrig.	3.63	11	33	56	Sioux	July	31	1880	543	
Warbonnet ck	Anderson, J. A.	Harrison	Warbonnet Ditch No. 2	Irrig.	1.48	20	33	55	Sioux	March	11	1908		899
Warbonnet ck	Anderson, Jno. A.	Harrison	Warbonnet D. No. 3	rrig.		20	33	50	Sioux	May	12	1914		1369*
Warbonnet ck., N. Br. of S. B.	Anderson, J. A	Harrison		Irrig.	.71	30	33	56	Sioux	May	31	1889	539a	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-E—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Warbonnet ck., N. Br. of S. B.	Anderson, J.	Adelia		Irrig.	.29	30	33	56	Sioux	Dec.	31	1891	539b	
Whitehead ck	Harrison, R.	Harrison	Harison Ditch	Irrig.	.06	13	33	51	Sioux	May	30	1888	547	

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION 2-F—(Concluded)

Source	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D.	Yr.		
Bazile creek	Packard, J. L.	Creighton	Creighton Mill Race	P'wer		21	29	5	Knox				*1002	
Bazile creek	Jirous & Slader	Creighton	Creighton Mills	P'wer	30.	21	29	5	Knox	Sept.	24	1908		914
Mud creek	Horan, T. W.	Fort Crook	Horan Canal	Irrig.	.37	34	14	13	Sarpy	Aug.	12	1909		958
Tekamah creek	Glasson, Joseph	Tekamah	Tekamah Roll Mills	P'wer	10.	19	21	11	Burt	Sept.	17	1906		839
Tekamah creek	Glasson, Joseph	Tekamah	Tekamah Roll Mills	Ice	1.	19	21	11	Burt	Jan.	21	1908		887

APPLICATIONS APPROVED SEPT., 1912 TO SEPT., 1914

Source	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Platte river	Fremont & Omaha P. Co.	Omaha	Fremont & Omaha P. Co.	P'wer	2000.	30	17	4	Butler	March	25	1908		884
Snake river	Kilpatrick Bros. Co.	Beatrice	Kilpatrick D. Nos. 1 & 2	Irrig.	200.	6	24	51	Box Butte	Jan.	25	1912		1155
Kilpatrick R. No. 1	Kilpatrick Bros. Co.	Beatrice	Kilpatrick res. ditch	Irrig.	17.	30	6	39	Chase	Jan.	25	1912		1160
Loup river	Boggs, Chas. T.	Lincoln	Schuyler develop.	P'wer	2000.	28	17	1	Platte-Colfax	March	25	1912		1187
Sand creek	Dunn, Jno. D.	Crawford	Syndicate ditch	Irrig.	27.42	32	33	52	Dawes	April	2	1912		1190
Otter creek	Nissen, Peter	Belmar	Otter canal	Irrig.	11.	5	15	40	Keith	May	24	1912		1198
Indian creek	Honnold Bros.	Whitney	Honnold-Wilson D.	Irrig.	.71	3	31	50	Dawes	May	25	1912		1199
Republican river	Pringle, Geo. N.	Parks	Parks ditch	Irrig.	17.	20	1	39	Dundy	June	18	1912		1202
Dave river	Koupal, Frank	Ord		Irrig.	.14	20	19	4	Valley	July	5	1912		1207
Niobrara river	Bourrett, John	Harrison	Jno. Bourret Ex. No. 2	Irrig.	.21	32	30	56	Sioux	July	19	1912		1209
Crooked Creek	Slawson, E. R.	Red Cloud	Slawson's Ice Pond	Stor.	.75	1	1	2	Webster	Aug.	8	1912		1213
Spotted Tail	Whitehead, J. J.	Mitchell	Whitehead Pow. Plt.	P'wer	10.	26	24	56	Sioux	Aug.	10	1912		1215
Loup, Mid.	St. Paul Elec. Co.	St. Paul	St. Paul Elec. L. W.	P'wer	2000.	3	14	10	Howard	Aug.	12	1912		1216
Sheep creek	Woodman, H. J.	Morrill	Gen. Utility L. & P. Plt.	P'wer	70.	17	23	57	Scotts Bluff	Aug.	17	1912		1217
Little Blue river	Larkin, M. E.	Hastings	Crystal Lake	Stor.	1.5	27	6	10	Adams	Aug.	17	1912		1219
Republican river	Rep. Riv. Pow. Co.	Omaha		P'wer	300.	15	1	9	Webster and Nuckolls	Aug.	26	1912		1221
Loup, Mid.	Lundy, Jas. W.	Sargent	Lundy Mill & Pow. Plt.	P'wer	400.	9	19	19	Custer	Sept	16	1912		1224
Blue river, big	Beardslee, Chas. O.	Lincoln	Pow. Sta. No. 2	Irrig.	1.42	34	15	37	Keith	Sept	16	1912		1225
Coon creek	Winterer, W. H.	Keystone	Coon Creek Ditch	Irrig.	1.	3	22	26	Thomas	Sept	16	1912		1226
Loup, Mid.	U. S. of America	Halsey	Nursery Ditches	Irrig.	4.	36	10	13	Buffalo	Sept	21	1912		1227
Wood river	Kimbrough, Cora	Shelton	Kimbrough Canal	Irrig.	3.57	19	3	28	Red Willow	Sept	21	1912		1228
Surface water	Bennett, Scott	McCook	Bennett Canal	Irrig.	5.	1	19	20	Custer	Oct.	14	1912		1233
Lillian creek	Lundy, Jas. W.	Doris	Lillian Cr. Canal	P'wer	500.	36	20	21	Custer	Oct.	15	1912		1234
Loup, Mid.	Lundy, Jas. W.	Doris	Mid. Loup Pow. Plt.	Irrig.	6.	14	33	55	Sioux	Oct.	22	1912		1236
Hat creek	Coffee, Jno. T.	Harrison	Coffee Flood W. Ditch	P'wer	145.	1	5	4	Saline	Feb.	17	1914		1354

APPLICATIONS APPROVED SEPT., 1912 TO SEPT., 1914—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole creek	Soderquist, Peter	Chappell	Soderquist Ditch	Irrig.	2.	36	12	45	Deuel	Oct.	22	1912		1237
Dugout, Lower	Hagerty, M. H.	Broadwater	Hagerty Ditch	Irrig.	1.	4	19	48	Morrill	Oct.	26	1912		1238
Mira res	McClellan, M. E.	North Loup		Irrig.	1.32		18	13	Valley	Oct.	30	1912		1239
Otter creek	Peterson, E. J.	Lemoyne	Peterson Ditch	Irrig.	1.32	5	15	40	Keith	Nov.	6	1912		1240
Niobrara river	Buhman, H. P.	Leigh	Bristow Lynch Pow	P'wer	300.	1-6	32	10	Boyd	Nov.	14	1912		1243
Rock creek	Benkelman Light Asso.	Benkelman	Benkelman Light Asso.	P'wer	20.	8	1	39	Dundy	Nov.	30	1912		1245
Niobrara river	Bennett, Sadie C.	Omaha	Mettlen Ditch	Irrig.	5.	4	28	54	Sioux	Dec.	18	1912		1248
Niobrara river	Bennett, Sadie C.	Omaha	Bennett Ditch	Irrig.	1.	1	28	54	Sioux	Dec.	18	1912		1249
Elkhorn river	Neligh, W. T. S.	West Point	West Point Hy-Elec. Pow.	P'wer	400.	18	22	6	Cuming	Dec.	26	1912		1250
Niobrara river	Hitshew, Geo.	Marsland	Geo. Hitshew Ditch	Irrig.	6.	5	28	52	Box Butte	Feb.	17	1913		1260
Blue river, big	Boyes, Burdette	Seward	Blue R. Pow. Plt. No. 3	P'wer	100.	5	8	4	Saline	March	13	1913		1265
Sow Belly creek	Barnes, Paul T.	Harrison	Barnes Res	Stor.	10.	19	32	55	Sioux	March	24	1913		1268
Loup river, south	Flagg, W. J.	Miller	W. J. Flagg	Irrig.	5.71	11	12	18	Buffalo	April	15	1913		1275
Cottonwood, little	Dodd & McDowell	Crawford	Dodd & McDowell	Stor.	10.	18	32	5	Sioux	April	15	1913		1276
Flood waters	Lenehan, Delia	Crawford	Lenehan Res	Stor.	1.	25	34	52	Dawes	April	16	1913		1278
Minnechaduza ck.	City of Valentine	Valentine	Valentine Pow. Plt	P'wer	40.	29	31	27	Cherry	April	16	1913		1279
Otter creek	Nissen, Peter	Pelmar	Otter Cr. Mut. Irr. Co.	Irrig.	.28	5	15	40	Keith	April	28	1913		1283
Frenchman river	Oliver Bros.	Wauneta	Oliver Bros. Pow. Plt	P'wer	50.	7	5	35	Hayes	April	28	1913		1284
Frenchman river	Oliver Bros.	Wauneta	Oliver Bros. Irr. Canal	Irrig.	3.2	7	5	35	Hayes	April	28	1913		1285
Wood river	Quail, T. J.	Miller	Wood River	Irrig.	2.28	14	11	18	Buffalo	May	1	1913		1286
Driftwood creek	Schmitz, J. A.	McCook	Schmitz Irr. Works	Irrig.	1.5	12	2	30	Red Willow	May	3	1913		1287
Flood waters	Arner, Jesse R.	Crawford	Arner Ditch	Irrig.	.11	27	33	53	Sioux	May	6	1913		1289
Loup river, mid	Holmes, Eddy	Nemo	Loup Val. Irr. Can.	Irrig.	.85	36	20	21	Custer	May	31	1913		1294
Sprink ck., little	Shramek, Marie	Havelock	Shramek Canal	Irrig.	1.5	22	22	55	Scotts Bluff	June	9	1913		1295
Buffalo creek	Porter L. & Inv. Co.	Haigler	J. R. Porter	Irrig.	3.32	1	1	41	Dundy	June	23	1913		1298

APPLICATIONS APPROVED SEPT., 1912 TO SEPT., 1914—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to Which Applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Indian creek	Stoneberg, S.	Max	Stoneberg Ditch No. 2	Irrig.	1.	11	2	37	Dundy	June	23	1913		1299
Loup river, mid	Lundy, Jas. W.	Doris	Lundy's Lake Can.	Irrig.	28.31	4	19	19	Custer	June	27	1913		1300
Loup river, mid	Lundy, Jas. W.	Sargent	Lundy's Lake Can.	Stor.	8.	2	19	19	Custer	July	19	1913		1306
Loup river, mid		Sargent		Irrig.	6.34	4	19	19	Custer	July	19	1913		1307
Loup river, mid		Sargent	Bill's Lake Canal	Irrig.	118.	36	20	21	Custer	July	19	1913		1308
Spring ck., little	Gilchrist, M. B.	Scotts Bluff		Irrig.	.14	22	22	55	Scotts Bluff	July	29	1913		1310
Loup river, mid	Hoge, John	Lincoln	Howard Co. Pow. Co.	P'wer	440.	29	13	12	Howard	Aug.	5	1913		1312
Lodge Pole creek	Bennett, Jno. D.	Cheyenne	Bennett Res.	Stor.	50.	22	15	55	Kimball	Aug.	11	1913		1313
Blue river, big	Mares, Frank	Wilber	Mares Irr. Canal	Irrig.	2.28	2	6	4	Saline	Aug.	12	1913		1314
Elk creek	Murray, Esther	Arapahoe	Murray Irr. Wks.	Irrig.	2.85	11	4	23	Furnas	Aug.	13	1913		1215
Republican river	Bailey, W. J.	Oxford	W. J. Bailey	Irrig.	.64	6	3	21	Furnas	Sept.	8	1913		1321
Lodge Pole creek	Wiegand, H. G.	Chappell	Wiegand Ditch No. 3	Irrig.	1.28	16	13	45	Deuel	Sept.	10	1913		1322
Lodge Pole creek	Wiegand, H. G.	Chappell	Wiegand Ditch No. 2	Irrig.	.42	16	13	45	Deuel	Sept.	10	1913		1323
Otter creek	Nissen, Peter	Pelmar	Otter Cr. Mut Irr. Co.	Irrig.	.28	5	15	40	Keith	Sept.	22	1913		1324
Horse creek	Mihan, John	Caldwell	Mihan Res.	Stor.	10.	27	23	58	Scotts Bluff	Nov.	3	1913		1329
Driftwood creek	Hesterwerth, J. H.	McCook	Hesterwerth Irr. Wks.	Irrig.	1.	14	2	30	Red Willow	Nov.	17	1913		1332
Ash Creek, W.	Broadhurst, N.	Crawford	Broadhurst Res.	Stor.	5.	35	32	51	Dawes	Nov.	17	1913		1333
Blue River, little	Giddings, O. J.	Ayr	Riverside Res.	Stor.	1.5	33	6	10	Adams	Dec.	2	1913		1338
Frenchman river	Krotter, F. C.	Palisade	Krotter Pow. Plt.	P'wer	65.	35	5	34	Hayes	Dec.	2	1913		1339
Main Bow creek	Hartington Elec. Co.	Hartington		P'wer	55.	31	31	2	Cedar	Dec.	12	1913		1341
Plum creek	Eggers, Thos.	Lewellen	Plum Cr. Ditch and Res.	Irrig.	1.14	23	16	42	Garden	Jan.	12	1914		1344
Dry creek	Guse, William	Crawford	William Guse Res.	Stor.	20.	35	34	52	Dawes	Jan.	13	1914		1345
Lone Tree creek	Beam, Earl	Crawford	Beam Ditch	Irrig.	.28	22	34	52	Dawes	Jan.	13	1914		1346
Greenwood creek	Meyer, J. H. W.	Denver	Meyer	Stor.	25.	15	18	50	Morrill	Jan.	16	1914		1348
Blue river, big	Beardslee, Chas. O.	Lincoln	Pow. Sta. No. 1	P'wer	120.	35	7	4	Saline	Feb.	17	1914		1353

APPLICATIONS APPROVED SEPT., 1912 TO SEPT., 1914—(Continued)

Stream	Name of Claimant	Post-Office Address	Name of Ditch	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No	App. No.
						S	T	R	County	Month	D	Yr.		
Spring creek	Swinbank, Sam'l	Crawford	Swinbank Res.	Stor.	2.	13	32	52	Dawes	March	3	1914		1358
White river	Hebbert, W. S.	Chadron	Hebbert Ditch	Irrig.	.71	34	33	50	Dawes	March	10	1914		1360
Dry creek, N.	Harsh & Weston	Crawford	Harsh & Weston	Irrig.	3.	31	34	51	Dawes	March	11	1914		1361
Loup river, mid.	Gr. Island Elec. Co.	Grand Island	Gr. Island Elec. Co.	P'wer	1000.	30	13	12	Hall	July	14	1914		1373
Pumpkin Seed cr.	Egleston, T. C.	Harrisburg	Airedale aCnal No. 1	Irrig.	.50	2	19	55	Banner	Sept.	4	1914		1380

APPLICATIONS DISMISSED SEPT. 1, 1912 TO SEPT. 1, 1914

Stream	Name of Applicant	LOCATION OF HEADGATE				App. No.
		S	T	R	County	
Big Blue River	A. F. Hemler	1	3	6	Gage	1097
Tub Springs	Tri State Land Co.	27	23	55	Scotts Bluff	1103
Platte River	R. H. Fowles	29	13	28	Lincoln	1118
Otter Creek	E. J. Peterson	4	15	40	Keith	1130
Platte River	William J. Coad	6	14	10	Douglas	1150
Elkhorn River	William J. Coad	2	12	10	Douglas	1151
Winter Creek	Imperial Land Co.	19	22	54	Scotts Bluff	1170
Loup River	H. E. Babcock	17	17	1	Platte	1178
Loup River	H. E. Babcock	21	18	5	Platte	1179
Loup River	H. E. Babcock	17	17	1	Platte	1180
Niobrara River	Frank A. Shotwell	33	31-32	7	Knox	1200
Niobrara River	George Hitshew	5-6-8	28	52	Box Butte	1206
North Platte River	Henry A. Nolte	32	19	48	Morrill	1214
North Loup River	L. E. Green	19	18	12	Greeley	1223
Loup River	Commonwealth Power Co.	28&32	17	4	Nance	1229
Beaver Creek	Commonwealth Power Co.	19	17	3	Platte	1230
Wet Spotted Tail	Hattie Merchant	26	24	56	Sioux	1263
Seep Water	James E. Jewell	6	20	52	Morrill	1271
Nine-Mile-Canon	Nine-Mile Irr. Dist.	10	21	53	Morrill	1272
Red Willow Creek	Alliance Irr. Dist.				Morrill	1273
Sunflower Draw	Enterprise Irr. Dist.	32&33	23	55	Scotts Bluff	1290
Dry Spotted Tail	Enterprise Irr. Dist.	20&21	23	56	Scotts Bluff	1292
Seep, Spotted Tail	Enterprise Irr. Dist.	20&21	23	56	Scotts Bluff	1293
Seep, Sheep Creek	C. N. Minner	17	23	57	Scotts Bluff	1296
Seep, Sheep Creek	Ramshorn Ditch Co.	20	23	57	Scotts Bluff	1297
Winter's Creek	Winter's Creek Canal Co.	19	22	54	Scotts Bluff	1305
Cedar River	C. N. Philbrick	1	17	7	Nance	1319
Frenchman River	Frenchman Val. Irr. Dist.	36	5	34	Hayes	1342

APPLICATIONS DISMISSED SEPT. 1, 1912 TO SEPT. 1, 1914—(Continued)

Stream	Name of Applicant	LOCATION OF HEADGATE				App. No.
		S	T	R	County	
Loup River	H. E. Babcock	17	17	1	Platte	129
Loup River	H. E. Babcock	17	17	1	Platte	219b
Loup River	H. E. Babcock	17	17	1	Platte	527
Loup River	H. E. Babcock	17	17	1	Platte	653
Loup River	H. E. Babcock	17	17	1	Platte	709
Loup River	Arnold C. Koenig	28	17	4	Platte	1029
Rock Creek	J. C. Ough	8	1	39	Dundy	1090

APPLICATIONS CANCELLED SEPT. 1, 1912 TO SEPT. 1, 1914

Stream	Name of Applicant	LOCATION OF HEADGATE				App. No.
		S.	T	R	County	
Loup River	H. E. Babcock	17	17	3	Nance	129
Big Blue River	J. W. Kersenbrock	32	9	3	Seward	211
Big Blue River, W. F.	J. W. Kersenbrock	32	9	3	Seward	214
Elkhorn River	Skrdla & Humpal	30	30	14	Holt	443
Wahoo Creek	Swift & Co.	31	13	9	Saunders	473
Loup River	Nebraska Central Irr. Co.	27	17	4	Nance	527
Loup River, Mid.	R. H. Sargent	35	20	20	Custer	573
Platte River	A. Rosewater	29	17	4	Butler	624
Loup River	Nebraska Central Irr. Co.	27	17	4	Nance	653
Pumpkinseed Creek	T. H. Smith	25	19	53	Cheyenne	722
Barton Creek	Geo. A. Lewis	6	24	19	Loup	764
White Clay Creek	H. A. Thornton	24	31	52	Dawes	773
Plum Creek	Michael Ruffing	33	33	54	Sioux	784
Boggy Creek	H. Wickersham	36	33	55	Sioux	821
Boggy Creek	H. Wickersham	7	32	54	Sioux	822
Boggy Creek	H. Wickersham	7	32	54	Sioux	823
Lodge Pole Creek	H. A. Clarke	36	15	57	Kimball	842
South Platte River	Wesley Tressler	16	13	39	Keith	903
Lodge Pole Creek	C. A. Forsling	36	15	57	Kimball	922
Republican River	Arapahoe Mun. L. & W. Plant	27	4	23	Furnas	949
Minnechaduza Creek	Village of Valentine					981
Little Cottonwood Creek	Calvin H. Dodd	13	32	53	Sioux	995
Walnut Spring	Village of Long Pine	31	30	20	Brown	1015
Long Pine Creek	Village of Long Pine	31	30	20	Brown	1016
Cedar River	F. G. Arnold	30	17	6	Nance	1023
Platte River	Arnold C. Koenig	7&20	12	7	Merrick	1028
Loup River, Mid.	S. B. Knudson	10	14	10	Howard	1034
Weeping Water Creek	Weeping Water L. & P. Co.	2	10	11	Cass	1037

APPLICATIONS CANCELLED SEPT 1, 1912 TO SEPT. 1, 1914—(Continued)

Stream	Name of Applicant	LOCATION OF HEADGATE				App. No.
		S	T	R	County	
Otter Creek	R. B. Howell	9 & 5	15	40	Keith	1073
Birdwood Creek	W. V. Hoagland	3	15	33	Lincoln	1075
Rock Creek	Rock Creek Pow. & Light Co.				Dundy	1090
Niobrara River	R. E. Knight	12	28	53	Sioux	1101
Pumpkinseed Creek	F. R. Reddish	30	19	50	Morrill	1102
Tub Springs	Tri-State Land Co.	27	23	55	Scotts Bluff	1103
Frenchman River	William Ough	12	5	36	Chase	1161
Wood River, Br.	Carl A. Jacobson	19	10	16	Buffalo	1163
Wood River, Br.	Cora Kimbrough	36	10	13	Buffalo	1166
Muddy Creek	W. E. Sarver	5	2	35	Hitchcock	1167
Frenchman River	John Sandburg	3	5	38	Chase	1168
Stinking Water Creek	A. C. Troutman	30	5	33	Hitchcock	1169
Little Blue River	Robert T. Williams	20	4	6	Clay	1171
Spring Creek	George McGinley	19	15	37	Keith	1173
Republican River	Carl L. Struve	7	3	20	Harlan	1174
Loup River, Mid	Edward D. Bennett	35	18	17	Valley	1177
White Creek	J. H. Denslow	35	30	54	Sioux	1183
Sand Creek	John J. Rasmussen	32	33	52	Dawes	1186
Sand Creek	John J. Rasmussen	32-33	32	52	Dawes	1191
Frenchman River	Kilpatrick Bros. Co.	23	6	40	Chase	1194
Frenchman River	Vinton & Chas. Kimberling	20	6	40	Chase	1196
Stinking Water and Frenchman River	Frenchman Val. Irr. Dist.	36	5	34	Hayes	1203
Sowbelly Creek	Paul T. Barnes	19	32	55	Sioux	1204
Minnechaduza Creek	City of Valentine	29	34	27	Cherry	1205
Lodge Pole Creek	Gustav A. Forsling	35	15	57	Kimball	1208
Lodge Pole Creek	Vaclav F. Kucera	36	14	48	Cheyenne	1211
Frenchman River	C. R. Woods	1	5	37	Chase	1218
Dugout Creek	Henry B. Hubbard	4	19	48	Morrill	1222

APPLICATIONS CANCELLED SEPT 1, 1912 TO SEPT. 1, 1914—(Continued)

Stream	Name of Applicant	LOCATION OF HEADGATE				App. No.
		S	T	R	County	
Surface Waters	Scott Bennett	19	3	28	Red Willow	1228
Stinking Water Creek	A. C. Troutman	30	5	33	Hayes	1231
Republican River	H. G. Calkins	5	1	14	Franklin	1235
Frenchman River	Frenchman Val. Irr. Dist.	3	5	38	Chase	1242
Wood River	John W. Haese	6	10	17	Buffalo	1244
Republican River	C. E. Sheffrey	16	3	20	Harlan	1246
White Horse Creek	John Bratt	9	14	30	Lincoln	1252
Lodge Pole Creek	Henry G. Wiegand	16	13	45	Deuel	1253
Lodge Pole Creek	Henry G. Wiegand	16	13	45	Deuel	1254
Lone Tree Creek	Lawrence Sides	18	34	51	Dawes	1258
Lone Tree Creek	Leslie E. Overton	20	34	51	Dawes	1259
Cottonwood Creek, L.	Herbert Broadhurst	7	32	51	Dawes	1264
Lodge Pole Creek	P. C. Mockett	30	15	55	Kimball	1266
Greenwood Creek	Edgar Hayes	15	18	50	Morrill	1267
A Well	William T. Young	34	15	57	Kimball	1269
A Well	Anna Young	32	15	57	Kimball	1270
Loup River, North	Ord Electric Co.	15	19	14	Valley	1277
Eternal Springs	Yorick Nichols	34	24	58	Scotts Bluff	1280
Pumpkinseed Creek	T. C. Egleston	30	19	55	Banner	1281
White Clay Creek	Herman A. Thornton	24	31	52	Dawes	1282
Otter Creek	Peter Nissen	5	15	40	Keith	1283
Wounded Knee Creek	Nannie E. Allwine	20	35	42	Sheridan	1302
Loup River, Mid.	John Hoge	29	13	12	Howard	1312
White River	Lizzie L. Denslow	1-2-35	30-31	54	Sioux	1318
Otter Creek	Peter Nissen	5	15	40	Keith	1324
Horse Creek	John Mihan	27	23	58	Scotts Bluff	1329
Blue River, Lit.	Giddings, C. J.	33	6	10	Adams	1338
Main Bow Creek	Hartington Elec. Co.	31	31	2	Cedar	1341
Greenwood Creek	J. H. Meyers	15	18	50	Morrill	1348

APPLICATIONS CANCELLED SEPT 1, 1912 TO SEPT. 1, 1914—(Continued)

Stream	Name of Applicant	LOCATION OF HEADGATE				App. No.
		S	T	R	County	
Republican River	Wm. Byfield	23	3	29	Red Willow	108
Loup River, Mid.	A. Butcher, et al.	36	20	21	Custer	220
Birdwood Creek	John A. Robertson	32	31	11	Holt	207
Eagle Creek	John D. Alfs	2	30	13	Holt	276
White Tail Creek	Ogallala Land & Cattle	26	15	38	Keith	716

RELOCATION

In the following Appropriations, the location of Headgate has been changed

App.	No.	Stream	Name of Canal	New Location			
				S	T	R	County
A.	707	White River	Hebbert Ditch	35	33	50	Dawes
A.	1072	Spotted Tail Creek	Brown Ditch	26	24	56	Scotts Bluff
A.	1	North Platte River	Holcomb Ditch	5	15	40	Keith
D.	821	North Platte River	Logan Ditch	24	20	51	Morrill
D.	347	Lodge Pole Creek	Bay State Ditch	30	15	55	Kimball
A.	1281	Frenchman River	Oliver Bros. Irr. Pow. Pl.	7	5	35	Hayes
A.	1285	Frenchman River	Oliver Bros. Irr. Plant	7	5	35	Hayes
A.	1287	Driftwood Creek	Schmidt Irr. Works	12	2	30	Red Willow
A.	1312	Loup River, Mid.	Howard Co. Pow. Co.	30	13	12	Howard
A.	1343	Platte River	Plattsmouth Pow. Plt.	32	13	13	Cass
App.	1316	White Horse Creek	John Bratt Ditch	8	14	30	Lincoln

The following statement shows the amount of money in the various funds on October 31, 1912, and the amount drawn from each of these funds, and also the balance remaining unexpended which reverted to the General Fund. It also shows the amount appropriated for the biennium beginning the first Wednesday in April, 1913, and the amount drawn from each of these funds to October 31st, 1914, and the balance remaining in each fund to this date. It shows the amount of fees received by this department during the period from November 1st, 1912, to October 31st, 1914, all of which has been paid to the State Treasurer. The fees up to April, 1913, were paid into the Institution Cash Fund, but since that time have been paid into the General Fund, and the statement below shows the amount received and the amount expended from that fund.

Fund	Balance Oct. 31, 1912	Drawn From 31, 1912 Balance Oct.	Unused	Appropriation of 1913	Expended Oct. 31, '14 Apr. 1, '13 to	Balance Oct. 31, 1914
Secretary	$ 1000 00	$ 1000 00	$	$ 5000 00	$ 3958 27	$ 1041 66
Asst. Sec'y	530 00	530 00	.....	3000 00	2375 00	625 00
Under Sec'y	450 00	450 00	.....	3200 00	3200 00	.....
Stenographer	350 00	350 00	.....	1680 00	1330 00	350 00
Field Help and Office Exp.	963 47	963 47	.....	10000 00	8364 90	1635 10
Extra Office Help	.....	.....	.....	5000 00	4084 30	915 70

Fees		Collected	Pd Treas.	On Hand	Expended	Balance
Paid to General Fund	$	$ 3519 92	$ 3519 92	.....	.....	.....
Paid to Cash Fund	6843 94	3228 88	3228 88	.....	7708 25	2364 57

	Amount of 1913 Levy	Collected by State Treas. Oct. 31, 1914	Expended to Oct. 31, 1914	Balance on Hand Oct. 31, 1914
State Aid Bridge Fund	$ 169672 41	$ 84948 14	$ 35760 73	$ 49187 41

INDEX