1928
Annual Report
Fifth Irrigation
District

H. F. Robinson Supervising Engineer

GANADO

This project in the Navajo country in Arizona, about 60 miles northwest of Gallup, New Mexico, diverts the water from Rio Pueblo Colorado to a reservoir in a flat on the north side of the stream where a small wet weather lake existed, and to irrigate lands therefrom lying below in the valley. The stream has been dammed by a rock filled crib dam, the water diverted through a canal to the reservoir which was formed by building an earthen dyke high enough to hold 16 feet of water with a sufficient freeboard. The capacity of the reservoir is about 4,300 acre feet. The project lies on both sides of the stream and the total area is about 1700 acres of which 707 acres on the south side are under ditch and the balance lies on the north side, of which only a part is now ready for water until two flumes are constructed. The area has been subdivided into approximately 10 acre tracts and tentatively allotted to those Indians who will make use of it.

J. L. Hubbell who owns a homestead on the reservation to which he acquired title prior

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to making it a part of the reservation, had appropriated the water of this stream. In 1903 he constructed a ditch and actually diverted the water and made beneficial use of it. He later made a proposition that he would relinquish his rights to the flow of the stream if the Government would give him a reservoir right of 400 acre feet per annum, and that he would do his share of the operation and maintenance thereafter. This agreement was ratified by the Department in 1913.

The project was practically finished in 1918 and has been operated since. The Indians were slow in taking it up but at the present time all of the good land we can irrigate at present is now claimed and worked to a greater or less extent. During the years in operation we have had to contend with storms and floods which have damaged the project from time to time. No one but Indians are using the water other than Mr. Hubbell who is irrigating 108 acres, and a Mission school which has 27 to 30 acres under cultivation. The Mission has done its share of operation and maintenance by donating labor.

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The Indians are taking hold of the work now in fine shape and have organized the Ganado Farm Association and hold monthly meetings to discuss ways and means and the betterment of their farming and home conditions. This Association has written asking that we complete the project that they may have more land for farming. The letter from the Association is as follows:

Ganado Arizona.
June 15, 1928

Mr. Robinson
Albuquerque, N.M.

Dear Sir:

There is no question that you are giving your uttermost interest to the great irrigation project in this part of the Navaho Indian territory.

The Ganado Farm Association is now urging upon you to request our honorable Government to enlarge the Ganado irrigation system. It is very difficult for the Indian on account of the situation and the condition of our ditches, due to the fact of the ditch being on the hillside which makes it very inconvenient for the Indian to make any progress.

We feel sure that your sympathetic consideration will be rendered regarding this matter.

The Government house where the Irrigation engineer is living needs to be repaired or else condemned, also the extension of the North ditch and South ditch.

We would like for you to send one of your engineers out to make an estimate on the work.

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As far as our present ditches go, the lands are all taken and now being all nicely cultivated by the Indians. There are four Indians already repairing their lands below the ditches and hoping for the extension of our Ganado ditches.

Very respectfully yours,

(SGD) John Curley
President

(SGD) David T. Hubbard
Secretary

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INFORMATION OF INTEREST

Source of Water Supply. Rio Pueblo Colorado.

Area of Drainage Basin. 208 sq. miles.

Annual Runoff in Acre Feet. An ephemeral stream. No measurements were made by State, Government or others.

Length of Irrigation Season. 180 days.

Average Elevation of Irrigated Land. 7,100 feet.

Rainfall. [illegible] inches.

Range of Temperature. -10 to +110.

Character of Soil in Irrigated Area. Sandy loam, with a little gravel and a few patches of adobe.

Principal Products. Alfalfa, corn, and garden.

Principal Markets. Local Indian traders. Very little sold.

Irrigation Plans. The project consists of a diversion from the Rio Pueblo Colorado, an ephemeral stream, throwing the water into a reservoir out of the stream channel with a capacity of 4434 acre feet. From there through a canal which divides one branch crossing the stream on a wide flume. All of the good land south of the stream is being used. That on the north needs the construction of two flumes to be available. Total area under ditch 1740 acres. On south side of stream 707 acres.

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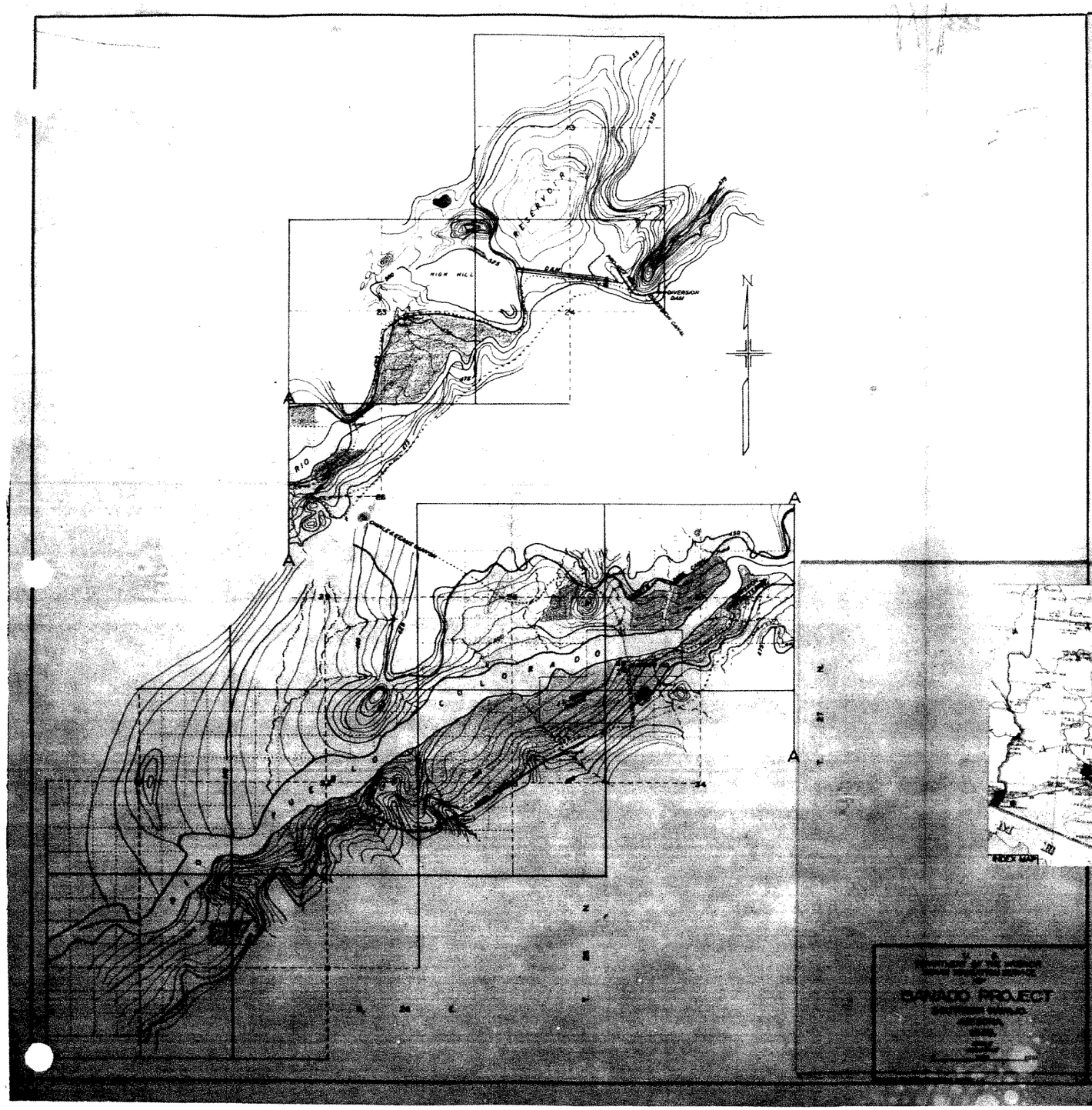


[illegible] MATRIX OF INFORMATION

Source of water supply. [illegible] Pueblo [illegible]

Area of drainage basin. 1005 sq. miles.

Annual runoff in acre feet. [illegible] feet. No measurements [illegible] by Pueblo, Government [illegible].

Length of irrigation season. 180 days.

Average elevation of irrigated land. [illegible] feet.

Rainfall. [illegible] inches.

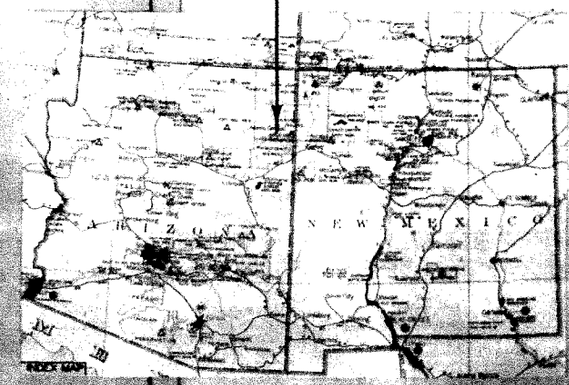
Range of temperature. -10 to +110.

Character of soil in irrigated area. Sandy loam, with a little gravel and a few patches of adobe.

Principal products. Beans, corn, [illegible] garden.

Principal markets. Local [illegible] markets. [illegible] little sold.

Description of works. [illegible] diversion from [illegible] feet, no embankment [illegible], changing the stream into a reservoir [illegible] of the stream [illegible] with a capacity of 4450 acre feet. Water flows through a canal [illegible] which divides one branch [illegible] the stream on [illegible] of the good land south of the stream [illegible] being used. That on the north needs the construction of two flumes to be available. Total area under ditch 1740 acres. On south side of stream 707 acres.



[illegible] of the [illegible]
[illegible]
DAMAGO PROJECT
[illegible]

NN013185

KIN LE CHEE

A small project some 9 miles north of Ganado, Arizona. Initiated by the Indians who live there, they agreed to give all of the common labor necessary in the construction if the Government would give the material, engineering and superintendence. Work was begun in 1921. The project consists of a diversion dam, two ditches and two high flumes to cross the main stream at one place and a large tributary in another.

During construction a heavy flood came down just before the gap in the dam was closed and partly took it out; it also did other damage and cut down the wash until the flumes had to be higher and longer than contemplated. Later during construction, another flood took out a flume before it was completed. The Indians have donated all of the labor possible - more than what was expected at the beginning of the job, and later, when it was necessary to do some heavy repairs because of flood damage, they gave two-thirds of the work, receiving pay for the other third. The project is in successful operation, and the Indians are doing fairly

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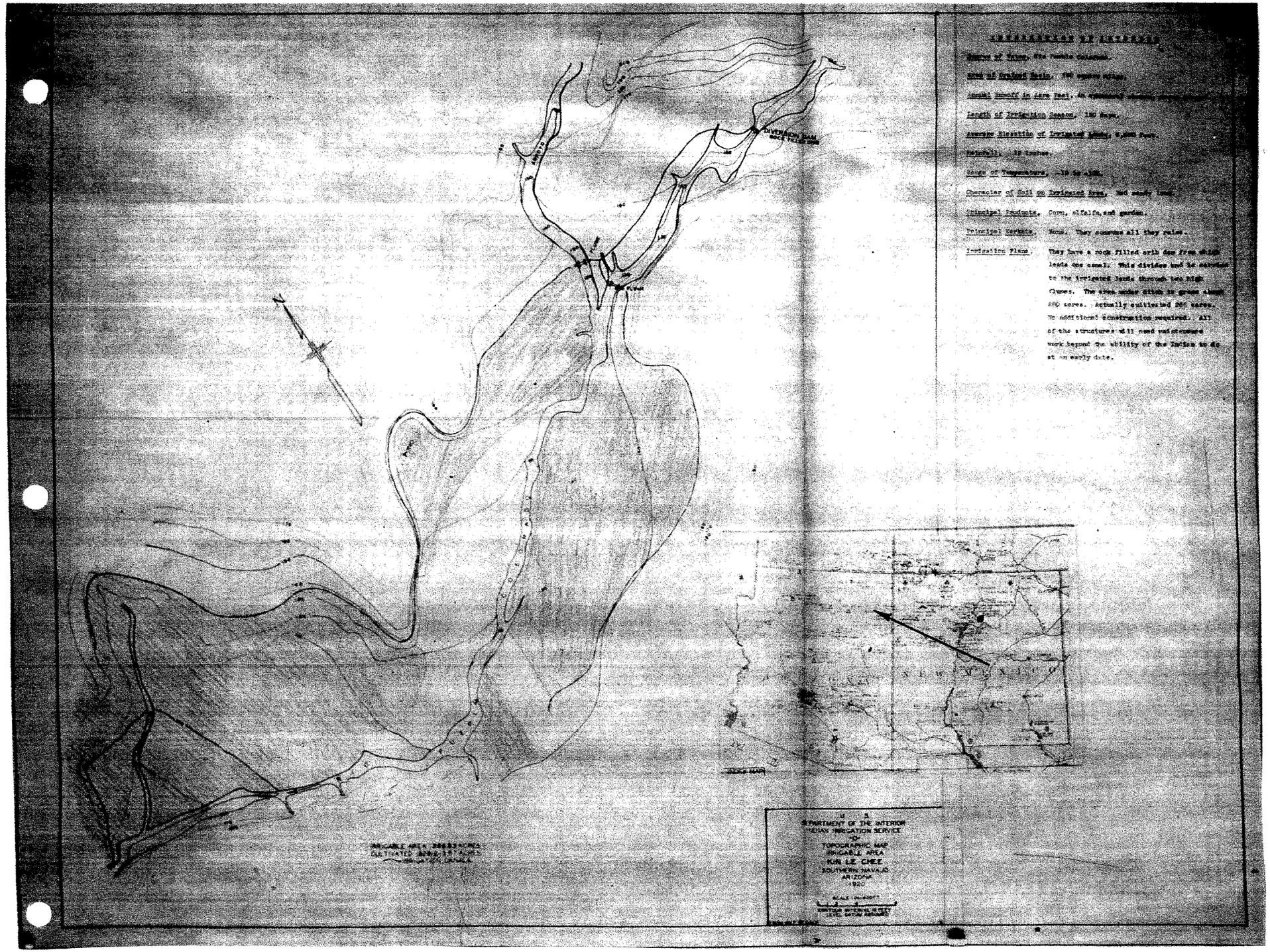

[illegible] of [illegible]

Source of Water, [illegible].

Area of Project Basin, [illegible] square miles.

Annual Runoff in Acre Feet, [illegible].

Length of Irrigation Season, 180 days.

Average Elevation of Irrigated Area, [illegible] feet.

Rainfall, [illegible] inches.

Range of Temperature, [illegible] to [illegible].

Character of Soil on Irrigated Area, Red sandy loam.

Principal Products, Corn, alfalfa, and garden.

Principal Markets, None. They consume all they raise.

Irrigation Plans, They have a rock filled crib dam from which leads the canal. This divider and is carried to the irrigated lands through two high flumes. The area under ditch is given about 880 acres. Actually cultivated 280 acres. No additional construction required. All of the structures will need maintenance work beyond the ability of the Indian to do at an early date.

NN013187

well.

Plans: Undoubtedly there will be some repair work needed during the next few years because the stream is subject to heavy and sudden floods, and any repairs to the large flumes and the dam will be beyond the capacity of the Indians. They do all of the ordinary O. & M.

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LEUPP - Corn Creek

All of the drainage from the Hopi country is concentrated above Leupp where it enters Corn Creek and then flows into the Little Colorado.

Investigations were made to divert these flood waters to land opposite Leupp. A canal and diversion were constructed and for several years, under the Superintendent, an area was under cultivation. Then a flood came carrying immense quantities of silt and much of the land was covered with from a few inches to six feet. The next season another flood came which eroded channels through this silt and down to the river level, and the cost of getting the water back on the land was so great that the project was abandoned.

Above Leupp some 20 miles, another investigation was made at what is known as the Tolani Lakes, where by the progressive building of an earthen dam water could be diverted, raising the dam as the land above filled up with silt. Several thousand acres of land could be irrigated if the water would be put on it. It was not considered entirely feasible largely because

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Alfalfa Field

Captain Tom Wash, Nava, N. M.

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of the difficulty of providing a safe spillway, or at least not commensurate with the cost and nothing further was done. Some day it may be considered feasible and the construction commenced.

Plans: No plans for immediate further work here.

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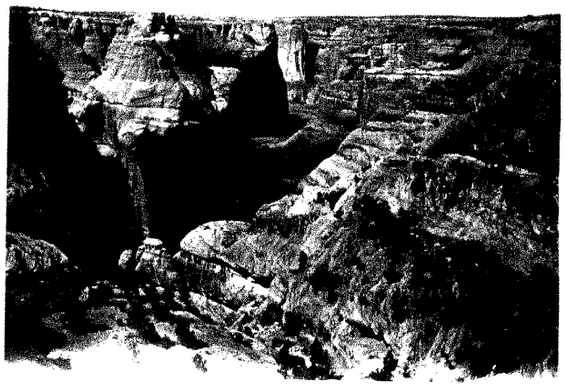
Water pouring over diversion dam at Red Lake

Volcanic dike Navajo Country



Looking down into Canon de chelley

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MOENCOPI WASH

This wash is near Tuba City, and Moencopi village of the Hopi. The project, however, does not include the lands of the Hopi who get their water from Reservoir Canon where it comes from springs. The Wash project diverts water from the Wash by means of a concrete dam, through a canal and irrigates the school and agency farm and lands below which are for the Navajo Indians. It has been hard to maintain the diversion and the ditch because of the desert nature of the country and the fact that the entire rainfall of the year usually comes in one or two torrential storms and heavy runoff. In the past the old dams washed out, and the present structure, put in by the Irrigation Service is the 5th or 6th dam built. The ditch has been lined with concrete for about 2000 feet from the head because of losses by seepage and breaking ditch.

Plans: None, other than occasional repairs necessitated by floods in the stream or in the cross drainage.

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View showing silt deposit partially sluiced out of feeder canal.

Red Lake, N.M.

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RED LAKE

Located about 15 miles north of Fort Defiance this project lies partly in Arizona and partly in New Mexico. It is an old project, initiated in about 1885, when the water was first diverted from Black Creek and a reservoir formed by building a dyke across a depression and running the water from the creek into it. From there it was proposed to irrigate some 700 acres of land. A short time after its construction and before the ditches had been built, it was washed out. In 1904 it was examined and a report made by H. F. Robinson. In 1909 the Superintendent in charge of the reservation announced that he would place a farmer at Red Lake and asked that it be rehabilitated. This was done at a cost of $925.69. The system of ditches was built about the same time. No use of the project was made and no farmer was stationed there. However, indirectly it was of benefit as the Indians living below on Black Creek used the reservoir to store flood waters which were turned down the creek when it was low and enabled them to divert it and do a little farming and to furnish stock water.

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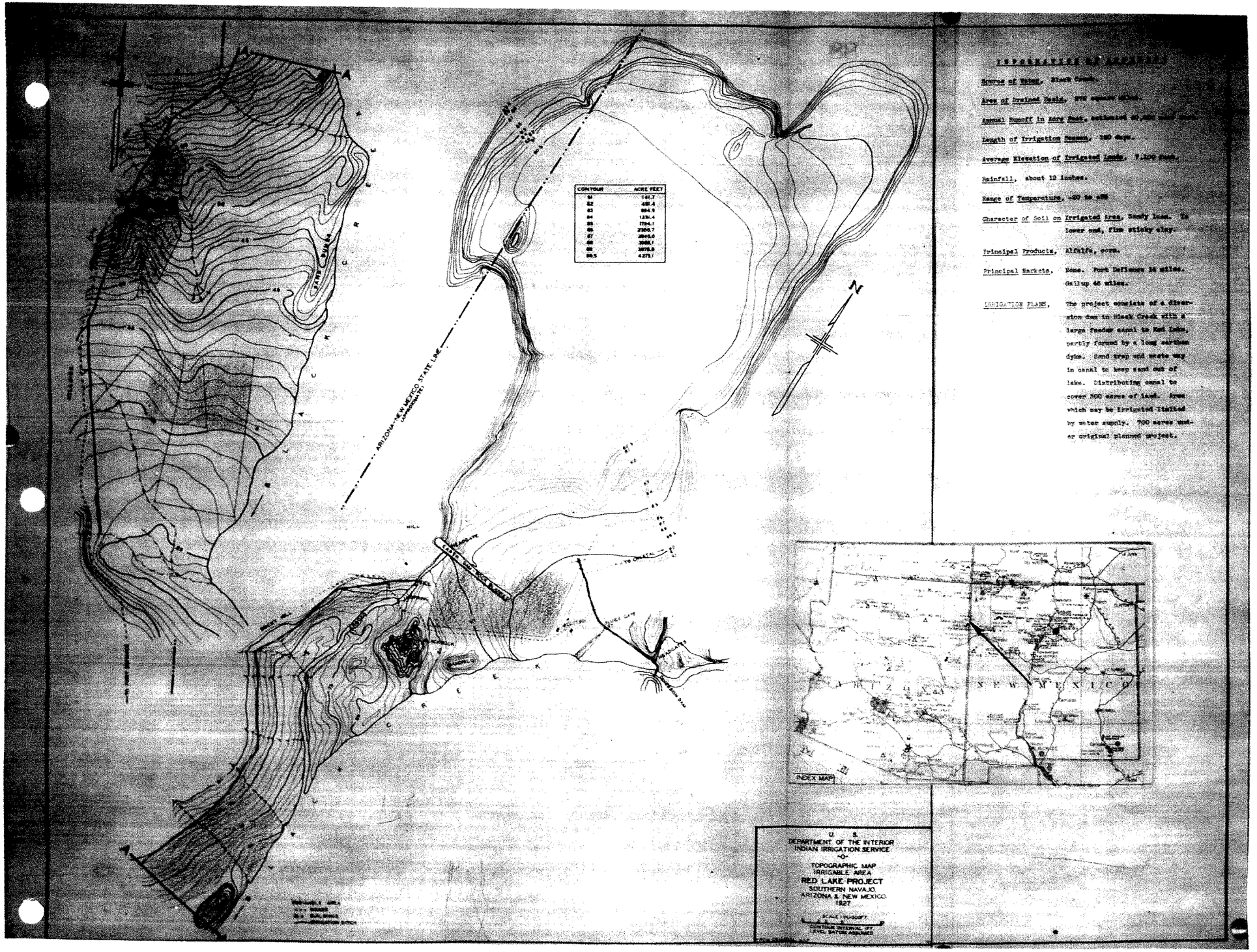

Source of Water, Black Creek.

Area of Drained Basin, [illegible] square miles.

Annual Runoff in Acre Feet, estimated [illegible] acre feet.

Length of Irrigation Season, 180 days.

Average Elevation of Irrigated Lands, [illegible] feet.

Rainfall, about 12 inches.

Range of Temperature, [illegible]

Character of Soil on Irrigated Area, Sandy loam. In lower end, fine sticky clay.

Principal Products, Alfalfa, corn.

Principal Markets, Home. Fort Defiance 14 miles. Gallup 46 miles.

IRRIGATION PLANS, The project consists of a diversion dam in Black Creek with a large feeder canal to Red Lake, partly formed by a long earthen dyke. Sand trap and waste way in canal to keep sand out of lake. Distributing canal to cover 300 acres of land. Area which may be irrigated limited by water supply. 700 acres under original planned project.

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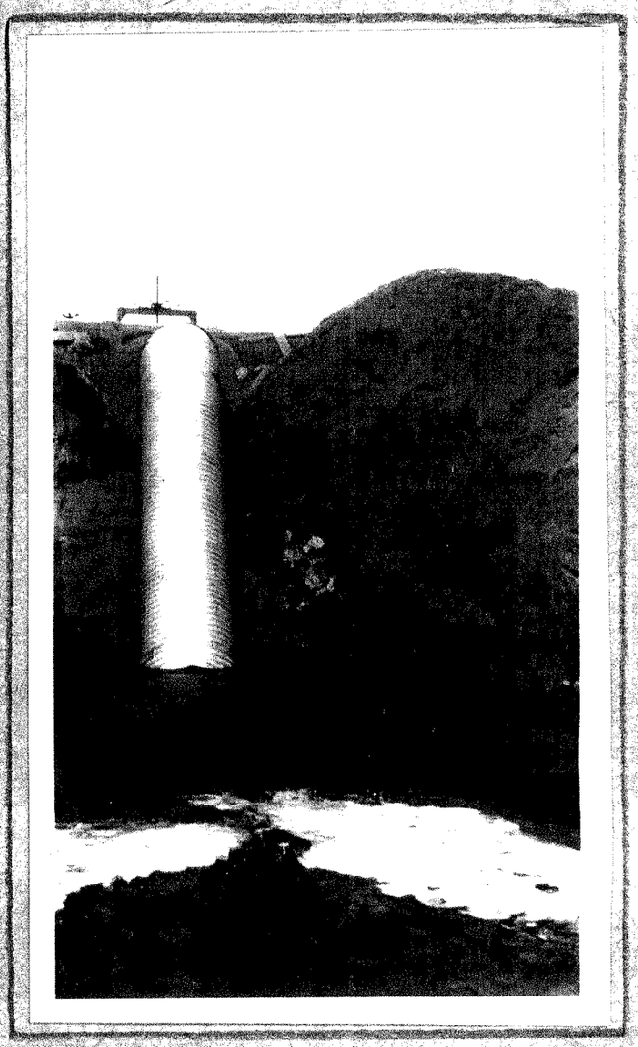

Showing downstream side of sluiceway

Red Lake Project

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The project was given no attention and allowed to deteriorate. Later it was again put into shape, but with the same result. At several times later it was requested that it be put into shape but this Service declined to do anything more without assurance that it would be used as a project.

In 1927, Superintendent Duclos, needing more farming land to raise forage for a dairy herd for the Fort Defiance Sanatarium, asked that it be put into shape, secured funds from Oil Royalty Funds, and assured us that it would be put to beneficial use. Forty acres of the land would be planted to alfalfa for the use of this herd. The project was again put into shape during the fiscal year 1928.

The project consists of a diversion dam across Black Creek, the Red Lake Reservoir with a capacity of 4,275 acre feet, a concrete gate at the head of the diversion canal which has a capacity of 65 second feet with a depth of one foot so that during flood times a large head can be diverted; a set of waste gates which discharge through a corrugated steel pipe, as the material is loose alluvium and sand and any other construction would be too expensive,

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Downstream side of sluiceway

Red Lake Project

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at the head of which is a sand trap; the diversion canal, and three miles of main canal to deliver water to the lands under the project. It is estimated that the cost of all of this new work will be $10,300.

The combined drainage area of Black Creek above the dam and of Red Lake is about 250 square miles, and it is estimated that the annual runoff is from 30 to 45000 acre feet. There should be stored each year an ample amount for this project and still allow the peaks of the floods carrying large quantities of silt to pass on down the stream.

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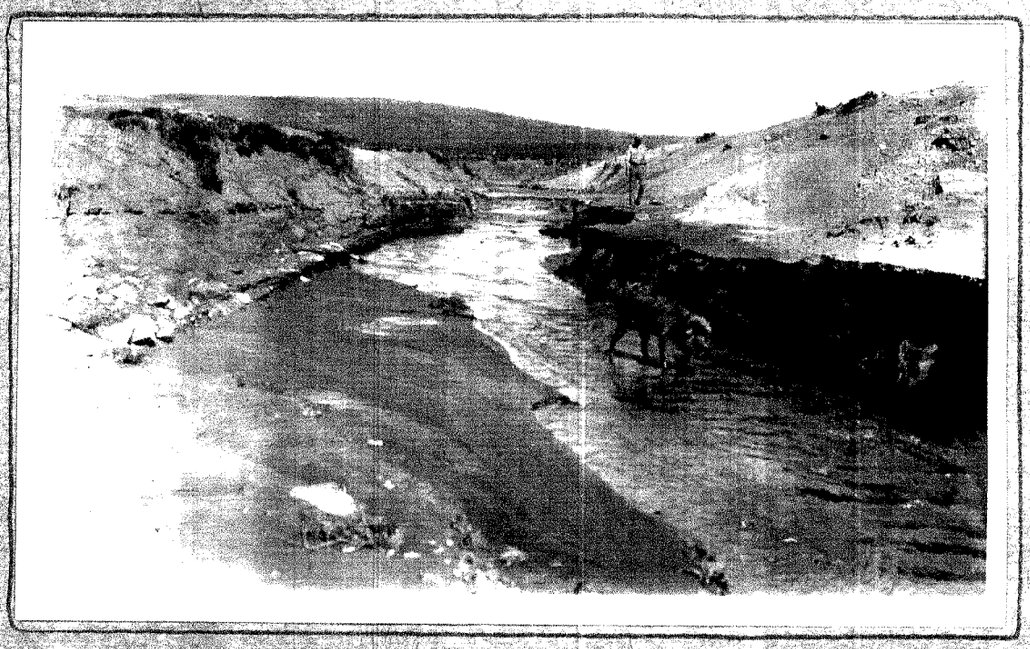

View showing silt removed from
feeder canal after sluicing 3 hours.

Red Lake, N.M.

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WEPO WASH

This is a project to control the flood waters of Wepo Wash, which lies on the north side of the First Mesa, and is the site of the largest cultivated area of the Hopi Indians.

For generations the Indians had depended upon the waters to spread over the valley floor during flood periods which irrigated the crops. When the wash lower down the country commenced to cut deep into the ground, and continued to cut back up the valley it would be impossible to bring the water from the bottom of the wash to the land and much of their farming land was being lost. An effort was made to spread the water over the land by deflectors and to do some work to prevent further cutting. This was partly successful. Some work is indicated as being necessary in the future to further control this.

Plans: Some work should be done to stop the retrogression of grades in the stream or the entire area will be lost. Just what work should be done or can be done is rather problematical. Further studies should be made as the conditions have changed materially since the former work was done.

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WATER SUPPLY, NAVAJO AND HOPI

The water development, so-called, to give domestic and stock water for the Navajo and Hopi Indians has been under way for a good many years. These Indians live in a most arid and inhospitable region, almost their entire livelihood comes from their stock raising, principally sheep.

For years the number of sheep and cattle was not increasing and it seemed had reached the limit under natural conditions. It was known that large areas of the reservation had sufficient grass and forage to care for considerable flocks and herds but the amount of water was very limited, there being large areas where there was none excepting in water holes after heavy rains or after the melting snows in the spring. This caused the Indian Office to decide to make an effort to develop water in these unwatered areas.

This work can be divided into several headings:

The development of underground water by drilling or digging wells. Several areas were found where by drilling deep holes artesian water was found, other areas in the valley

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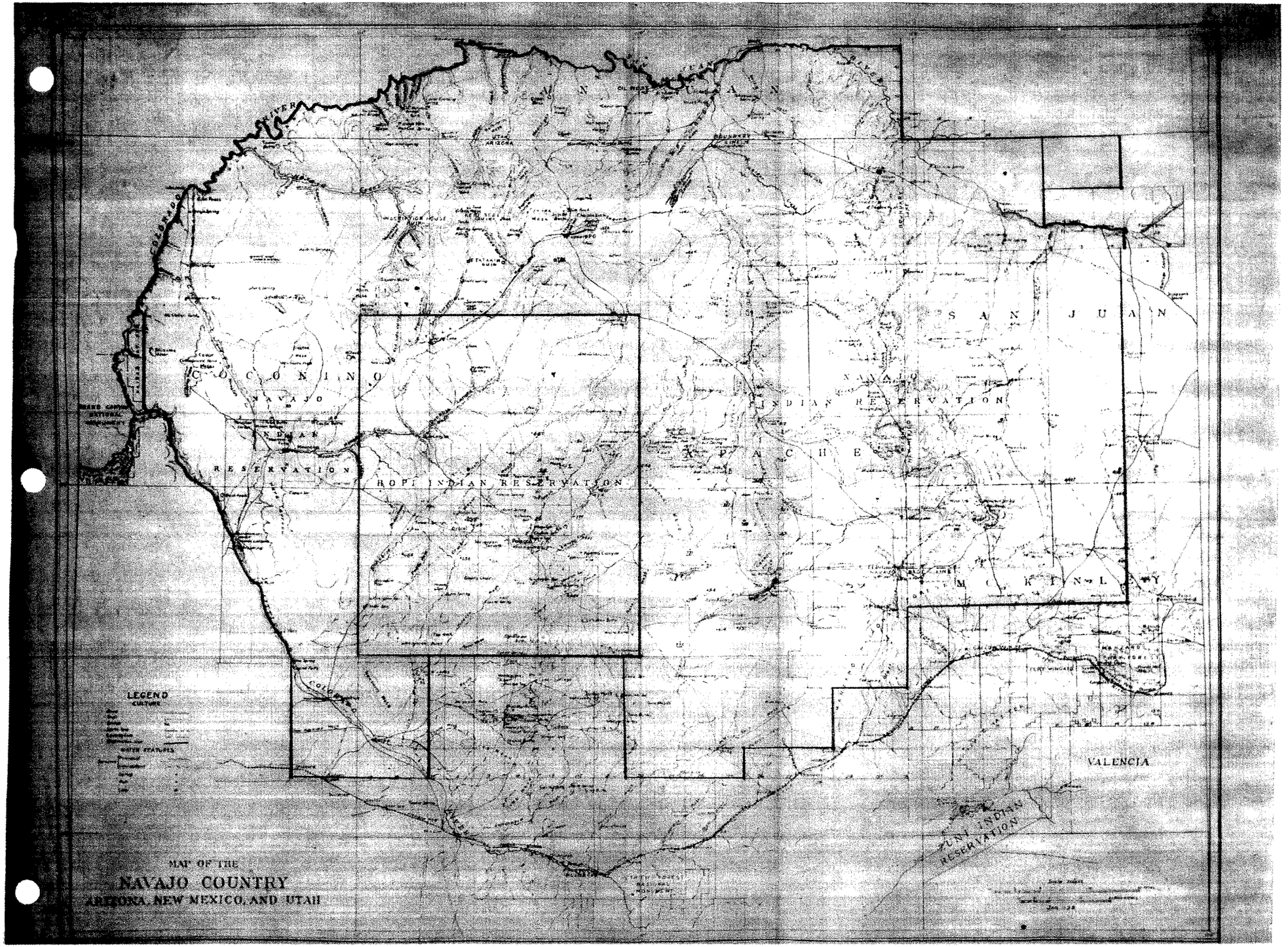

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water sufficient to water comparatively fair sized herds was found at reasonable depths, say under 150 feet, and wells were drilled and equipped with a pump, windmill, tank, and trough. In some few places it was found that shallow wells only a comparatively few feet in depth could be dug in the bottom of washes, some of these were equipped with windmills and others were simply left open for the Indians to get water.

At various points throughout the reservation springs are found. Not many of these springs are of any material size, most of them giving a few gallons an hour as a maximum after development. In some of them the water was not concentrated and simply seeped from a hard outcropping and none of the water was available for use. All of these various springs as far as possible were developed, the water concentrated, and piped out to concrete troughs where it was available for domestic purposes and for stock.

Another phase of water development is the building of reservoirs or tanks in which rain water and storm flow are conserved for a greater or less time.

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Tonalea Well

near Red Lake.

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During the past year no new wells were drilled, it being thought best to concentrate on the development of springs. In doing this work in the early years the work was done where the greatest results seemed to be obtainable, irrespective of the division of the six jurisdictions of the Navajo country. During the last several years, however, an effort has been made to apportion the available funds to the various jurisdictions with a bigger percentage to those jurisdictions who had had the least amount of work done in the past.

The following summary of the work done during the year as prepared by the General Foreman in charge of the work is submitted:

Hopi

On this reservation one spring development party which worked during the months of March, April, May, and part of June, developed eight springs and one well, a reinforced concrete stock watering trough constructed at each spring and three reinforced concrete troughs constructed at the one well, also a concrete trough constructed at well to replace old worn out metal trough.

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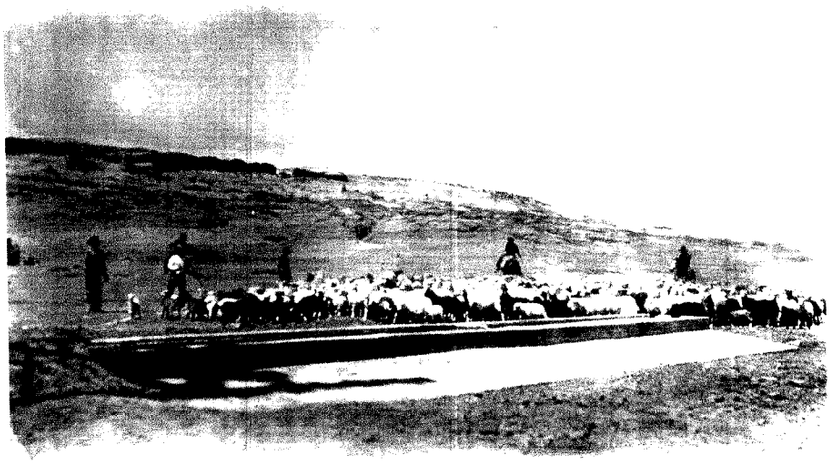

Tonalea Well

near Red Lake

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In addition to the above, the necessary operation and maintenance of thirty seven wells, windmills, tanks, and troughs, also operation of headquarters shop, maintaining trucks, equipment, and other necessary work connected with the general operation.

Western Navajo

During the year on this reservation there were fourteen springs developed and reinforced concrete stock watering troughs constructed at each spring, also the necessary operation and maintenance of wells, windmills, tanks and troughs, and springs developed during past years; also a small warehouse was erected for supplies.

Leupp

On this reservation there was one spring and three dug wells developed and reinforced concrete stock watering troughs constructed at each, together with the necessary operation and maintenance of wells, windmills, troughs, and springs developed in past years.

Southern Navajo

In addition to the general operation and maintenance of thirty wells, windmills, tanks, and troughs, there were nine springs developed

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Old Red Lake windmill showing
pond caused by overflow of trough.

WESTERN NAVAJO

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and reinforced concrete stock watering troughs constructed.

Northern Navajo

During the year in addition to the general operation and maintenance of thirteen wells, windmills, tanks and troughs, there were four reinforced concrete stock watering troughs constructed to replace old and worn out metal troughs constructed at wells, nineteen springs and eight dug wells developed, and a reinforced concrete stock watering trough constructed at each; also the maintenance of springs developed in past years, together with erecting a small storeroom or warehouse in which to store supplies.

Total dug wells developed -	12
Total springs developed -	51
Total reinforced concrete troughs constructed	53

It has been recognized by the Department and all other agencies and persons having knowledge of the work, that this water development is probably doing more material good for these Indians than any other work that could be done and it is encouraging to see that Congress has reached the same conclusion and is making more liberal appropriations for water development.

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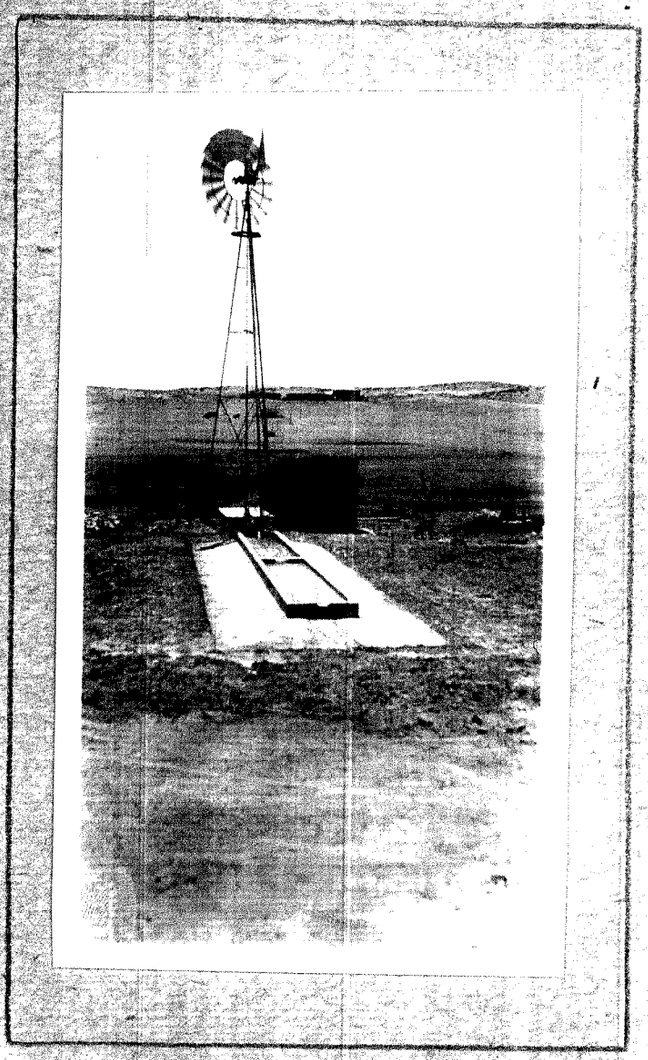

WESTERN NAVAJO

Tonalea well and trough after completion.

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At the end of the present fiscal year there had been developed 202 springs. A list of the first 104 has heretofore been submitted and a list of springs 105 to 202 inclusive is attached hereto. We have 131 wells that are equipped with pump, windmill, tanks and troughs.

When we began this work both tanks and troughs were built of metal but it is found that their life was comparatively short because of the nature of the water in many places and all new development and all replacements are now of concrete. There have also been developed 26 artesian wells and a number of other developments for water for these Indians has been made.

Plans for the next fiscal year are even more elaborate than in the past as the amount of money available is considerably greater. We will have during the fiscal year of 1929, twelve outfits in the field developing springs, doing betterment work with troughs and tanks, and operation and maintenance of the wells and springs already developed.

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105

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Bitter Seep Spring
Other Names
Reservation Western Navajo
Location 5 miles N.E. Tanner Wash

Date Developed December 1926
Flow in Gals. per minute:
Before Development 2 After 2

Development (or remarks)

This spring was thoroughly cleaned out and excavated down into shale, perforated pipe laid and backfilled with gravel filter, and a reinforced concrete stock watering trough constructed. Distance from spring to trough 200'.

106

Name Tanner Wash Spring
Other Names
Reservation Western Navajo
Location About 50 miles west of Tuba City, or 17 miles south of Lee's Ferry on Tuba City-Lee's Ferry Road.
Date Developed Dec. 19 26
Flow in gals. per minute:
Before Development None After 3

Development (or remarks):

This was merely a seep before development. Excavated a trench 50' long x 4' wide x 5' deep, perforated pipe laid and backfilled with gravel filter, two reinforced concrete troughs constructed. Distance from spring to trough 600'.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Tolthlecon
Other Names Sweet Water
Reservation Western Navajo
Location 3/4 mile south of Bitter Seeo Spring

Date Developed December 19 26
Flow in Gals. per minute:
Before Development 1 After 1

Development (or remarks)

This spring was excavated down into original formation (shale) perforated pipe laid and backfilled with gravel filter, reinforced concrete stock watering trough constructed; distance from trough to spring 160'.

Name Tan-E-Kis
Other Names Sheep Dip Spring
Reservation San Juan Navajo
Location 1 mile north of Tees-Nos Pos Store

Date Developed November 19 26
Flow in gals. per minute:
Before Development 1-3/4 After 2

Development (or remarks):

This was several seeps coming out along bank of wash. A trench was cut down in hard sand stone, water collected to a basin trench and collecting basin filled gravel filter, perforated pipe also laid and water piped to a storage reservoir, capacity 3000 gals., the latter used for sheep dipping; overflow piped to two reinforced concrete stock watering troughs. Distance from spring to troughs 654'.

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109

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Tsa-Ya-To Tucase
Other Names Salt Wash Spring
Reservation San Juan Navajo
Location 3 miles N.W. of Tes Nos Pos Store, ¼ mile west of main traveled road.
Date Developed Dec. 19 26
Flow in Gals. per minute:
Before Development 1 After 1

Development (or remarks)

This spring flows from a crevice in sand stone; crevice cleaned out, perforated pipe installed, backfilled with gravel and covered with a layer of concrete. A reinforced concrete trough also constructed. Distance from spring to trough 324'. This water is of rather poor quality for domestic use.

110

Name Rat Spring
Other Names
Reservation Western Navajo
Location

Date Developed Nov. 19 26
Flow in gals. per minute:
Before Development After

Development (or remarks):

This spring was excavated into the rock and a pipe line laid 250' to a concrete trough.

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111
(112)

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Sae-Es-Skeesie Spring
Other Names
Reservation Hopi
Location 3/4 miles east of Low Mountain Store

Date Developed Nov. 19 26
Flow in Gals. per minute:
Before Development 1¼ After 2

Development (or remarks)

This spring has been partly developed several years ago. In order to further develop it was necessary to take out all the old work extended excavation backfilled with gravel filter and piped water 400' to a reinforced concrete stock watering trough.

113

Name Hole in Rock Spring
Other Names
Reservation Western Navajo
Location 10 miles north Tuba City

Date Developed Oct. 19 26
Flow in gals. per minute:
Before Development 10 After 20

Development (or remarks):

This spring was excavated down into porous sand stone, walled up with stone and a concrete lab over top, also a reinforced concrete trough constructed. The Indians have installed a pump to lift water.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Shan To
Other Names Cha-El Sissie Beto
Reservation San Juan
Location 8 miles N.W. Tolth-la-con Store, 10 mi. S.E. Nocki To

Date Developed Oct. 19 26
Flow in Gals. per minute:
Before Development 3/4 After 1

Development (or remarks)

The springs, two in number, flow out of solid sand stone. A trench was cut, perforated pipe laid and backfilled with gravel filter, a small storage reservoir, capacity 3 bbls. constructed; also a reinforced concrete stock watering trough constructed. Distance from spring to trough 290'.

115

Name Te-La Spring
Other Names
Reservation San Juan
Location 4½ miles N.W. of Tes Nos Pos Store

Date Developed Nov. 1926
Flow in gals. per minute:
Before Development ½ After 3/4

Development (or remarks):

This spring was excavated down through sand stone, gravel, and into very dense sand stone. Trench cut, perforated pipe laid and backfilled with gravel filter; a reinforced concrete trough constructed. Distance from spring to trough 228'.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Frank W. Smith Spring
Other Names Mud Spring
Reservation San Juan
Location 3 miles east of drilled well #901

Date Developed November 19 26
Flow in Gals. per minute:
Before Development 1 gal. After 3

Development (or remarks)

This was three seeps, each of which was excavated down into shale and water concentrated to a basin, perforated pipe laid, backfilled with gravel filter and a reinforced concrete trough constructed. Distance from springs to trough 260'.

Name Kimme-Do-De-Tsie Springs (2 in number)
Other Names
Reservation San Juan
Location 5 miles north of Newcombs store

Date Developed Nov. 19 26
Flow in gals. per minute:
Before Development 2 After 5

Development (or remarks):

These springs were excavated down into original formation (shale), perforated pipe laid and backfilled with gravel filter, a reinforced concrete trough constructed. Distance from spring to trough 130'. The above springs were mere mud holes before developed.

REPRODUCED AT THE NATIONAL ARCHIVES

118

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Georges Spring
Other Names Goat Spring
Reservation San Juan (Oil Royalty & Leases)
Location 1½ miles SW Tes Nos Pos Store

Date Developed Dec. 1926
Flow in Gals. per minute:
Before Development 3 After 3

Development (or remarks)

This spring was excavated down thru gravel and into shale depth 9½', an open joint wall laid up of stone to a height of water level, perforated pipe laid and backfilled with gravel filter and covered with a layer of concrete, a reinforced concrete stock watering trough constructed. Distance from spring to trough 100'.

119

Name White Water
Other Names Rubens or Many Cattle Spring
Reservation San Juan (Oil Royalty & Leases)
Location 4½ miles north of Hugh Fautzes Store

Date Developed Dec. 1926
Flow in gals. per minute:
Before Development 1½ After 1-3/4

Development (or remarks):

This spring was excavated down thru sandstone (depth 5') and into shale, perforated pipe laid and backfilled with gravel filter; also a wall was laid up of stone to protect the trough from flood water coming off side of Mesa. A reinforced concrete stock watering trough constructed. Distance from spring to trough 155'.

REPRODUCED AT THE NATIONAL ARCHIVES

120

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Sahaezly Spring
Other Names Demonstration Farm House spring
Reservation San Juan (Oil Royalty & Leases)
Location 4 miles north of Newcombs store

Date Developed Dec. 19 26
Flow in Gals. per minute:
Before Development 6 After 8

Development (or remarks)

This spring was excavated down into hard sand stone, perforated pipe laid and backfilled with gravel filter, a reinforced concrete trough constructed. Distance from spring to trough 140'.

121

Name Tocito Spring
Other Names Fautz Spring
Reservation San Juan (Oil Royalty & Leases)
Location At Fautz Store

Date Developed Dec. 19 26
Flow in gals. per minute:
Before Development After

Development (or remarks):

There was no development work done on this spring. Water was piped from spring to x reinforced concrete stock watering troughs.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Say-Et Sisey Seeps 1 and 2
Other Names
Reservation Western Navajo
Location Near Inscription House, 27 mi. north of Red Lake on road to Navajo Mountain
Date Developed April 1927
Flow in Gals. per minute:
Before Development After

Development (or remarks)

This was excavated back into the rock and 400' of pipe laid to a concrete trough.
Donated labor $39.00

Name Sheep Dip Wells
Other Names
Reservation San Juan
Location At Denehotso near Trading Post

Date Developed April 1927
Flow in gals. per minute:
Before Development None After 2

Development (or remarks):

This well was excavated down in sand stone to a depth of 13 ft. Diameter at bottom 7'6", diameter at top 4'6", and covered with lumber.

REPRODUCED AT THE NATIONAL ARCHIVES

124

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Sheep Dip spring
Other Names
Reservation San Juan
Location 2½ mi. N.E. Two Gray Hills

Date Developed April 19 27
Flow in Gals. per minute:
Before Development Seep After 2-3/4

Development (or remarks)

These seeps came out in gravel close to bank of wash. Excavated down into shale, laid perforated pipe and all the seeps concentrated to perforated pipe imbedded in gravel and pipe to storage tank size sufficient to hold 3500 gal. for sheep dipping purposes or 12x12x4½' deep and covered with a slab of concrete and overflow piped to reinforced concrete trough.

125

Name Mud spring
Other Names
Reservation San Juan
Location 1½ miles from Sheep Dip Spring

Date Developed April 19 27
Flow in gals. per minute:
Before Development None After 1

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter and piped 190' to a reinforced concrete stock watering trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name West Sheep Dip or Sheep Dip canon spring
Other Names
Reservation San Juan
Location 4 mi. north Two Gray Hills store

Date Developed May 19 27
Flow in Gals. per minute:
Before Development Seeps After 3

Development (or remarks)

These seeps, several in number, came out along the bank of the wash. A ditch was excavated down into shale, perforated pipe laid and backfilled with gravel, Pipe line parelleling wash to a suitable place to construct a reinforced concrete trough. Earth and brush work was put in to change channel as a means of flood protection.

Name To Inchony Spring
Other Names
Reservation San Juan
Location 21 miles E. of Kayenta on Gallup-Kayenta road

Date Developed May 19 27
Flow in gals. per minute:
Before Development None After 3/4

Development (or remarks):
This spring was excavated down in to sand stone and will be piped to a reinforced concrete trough soon after July 1st.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Charley Curley Spring
Other Names
Reservation San Juan
Location 6 mi. west Highway & 4 mi. north Two Gray Hills store.

Date Developed May 19 27
Flow in Gals. per minute:
Before Development Seep After 1

Development (or remarks)

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter and piped to a reinforced concrete trough. Distance from spring to trough 400'.

Name Black Rock Spring
Other Names
Reservation ~~San Juan~~
Location 4 miles N. Two Gray Hills Store

Date Developed May 19 27
Flow in gals. per minute:
Before Development Seep After 2½

Development (or remarks):

These seeps came out along bank of wash, excavated down into shale, perforated pipe laid and backfilled with gravel and piped to a reinforced concrete trough. Distance from spring to trough 250'.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Inscription Spring
Other Names
Reservation Western Navajo
Location 30 mi. N.W. Red Lake

Date Developed May 19 27
Flow in Gals. per minute:
Before Development Seep After 1

Development (or remarks)

The water at this seep was concentrated to a basin, perforated pipe laid and piped to a reservoir shot out in solid rock.

131

Name Say Atho Spring
Other Names
Reservation Western Navajo
Location 18 mi. north of Kaibeto

Date Developed May 19 27
Flow in gals. per minute:
Before Development Seep After 2

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and piped to a reservoir shot out in solid rock.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Side To
Other Names
Reservation Western Navajo
Location

Date Developed May 19 27
Flow in Gals. per minute:
Before Development Seep After ½

Development (or remarks)

This spring was excavated down and into shale for storage capacity. A small house was built over the spring.

133

Name Tachine Badoni Spring
Other Names
Reservation Western Navajo
Location 8 mi. N.E. Kaibeto

Date Developed May 19 27
Flow in gals. per minute:
Before Development Seep After 1

Development (or remarks):

This spring was excavated down to original formation (shale), perforated pipe laid and backfilled with gravel filter. A reinforced concrete trough was constructed; distance from spring to trough 400'.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name To-Na-Te Spring
Other Names
Reservation Southern Navajo
Location 8 mi. SE Indian Wells

Date Developed May 19 27
Flow in Gals. per minute:
Before Development None After 1

Development (or remarks)

This spring was excavated down thru sand stone and in to shale for storage capacity and a reinforced concrete trough constructed.
Distance from spring to trough 100'.

Name Sischene Badoni Spring
Other Names
Reservation Western Navajo
Location 12 mi. NE Kaibeto

Date Developed May 19 27
Flow in gals. per minute:
Before Development 1 After 2

Development (or remarks):

This spring was cleaned out, excavated down and into shale, perforated pipe laid, and backfilled with gravel filter, a trough or water basin was shot out in the hard sand stone. No concrete trough constructed.

REPRODUCED AT THE NATIONAL ARCHIVES

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Kaibeto Springs 1 and 2
Other Names
Reservation Western Navajo
Location At Kaibeto

Date Developed April 19 27
Flow in Gals. per minute:
Before Development None After 4

Development (or remarks)

These springs were excavated down to original formation (shale), water concentrated and piped to a storage reservoir for sheep dipping purposes and overflow piped to two reinforced concrete troughs.

136a

Name Kaibeto Seeps 3 and 4
Other Names
Reservation Western Navajo
Location 2 mi. from seeps 1 and 2

Date Developed April 19 27
Flow in gals. per minute:
Before Development None After 1

Development (or remarks):

These springs were excavated down thru Dakota sand stone and into shale, perforated pipe laid, backfilled with gravel, piped to reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

137

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Sand Stone spring
Other Names
Reservation Western Navajo
Location 1 mi. south Cedar Ridge

Date Developed March 1927
Flow in Gals. per minute:
Before Development ½ After 2

Development (or remarks)

This spring was excavated down in to shale, perforated pipe laid, backfilled with gravel and piped to a reinforced concrete stock watering trough.

138

Name Chisset Yezzie Well
Other Names
Reservation Western Navajo
Location 4 mi. south Cedar Ridge

Date Developed March 1927
Flow in gals. per minute:
Before Development None After 1½

Development (or remarks):

This well was dug in a wash to a depth of 10', rock wall laid up and backfilled with coarse gravel, also a reinforced concrete trough constructed.

REPRODUCED AT THE NATIONAL ARCHIVES

139

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Cow Camp Spring
Other Names
Reservation Hopi
Location 2 mi. south Devil Spring

Date Developed March 19 27
Flow in Gals. per minute:
Before Development Seep After ½

Development (or remarks)

This seep was developed by excavating down in to shale for storage capacity and it will furnish enough water for domestic use and what livestock they have around the camp.

140

Name Devil Spring
Other Names
Reservation Hopi
Location 2 mi. south Hoanai Spring

Date Developed March 19 27
Flow in gals. per minute:
Before Development None After 3/4

Development (or remarks):

This was merely a very small seep before development. Spring was excavated down and in to shale, perforated pipe laid, backfilled with crushed lime stone, and piped to a reinforced concrete stock watering trough. Distance from spring to trough 240'.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Brimhall Wash Spring
Other Names
Reservation Northern Navajo
Location 4 miles east of Burnhams stone up Brimhall Wash

Date Developed October 19 27
Flow in Gals. per minute:
Before Development Seep After ½

Development (or remarks)

This seep along side of hill was developed by means of dug trench, perforated pipe laid and backfilled with gravel and piped to a reinforced concrete trough.

Name Be Daa To Spring
Other Names
Reservation Northern Navajo
Location 6 mi. north of Rock Point Store

Date Developed October 19 27
Flow in gals. per minute:
Before Development 2½ After 3

Development (or remarks):

This spring came up thru crevice in sand stone. It was, however, further excavated, flow increased, perforated pipe laid and backfilled with gravel and piped to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Gleason Sega Well
Other Names
Reservation Northern Navajo
Location 7 miles NE of Newcombs Store on Old Chaco and Farmington Road
Date Developed Nov. 19 27
Flow in Gals. per minute:
Before Development 1/2 After 3.4

Development (or remarks)

This well had been partly developed by the Indians in the past. It was thoroughly cleaned out, new wall laid up, concrete slab over top of well with man hole and opening for pump, and a reinforced concrete trough constructed.

Name Hogan Say-any Spring
Other Names
Reservation Northern Navajo
Location 9 mi. west of Sweet Water on old Kayenta Road
Date Developed Nov. 19 27
Flow in gals. per minute:
Before Development 1 After 1¼

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter and piped to a reinforced concrete trough. Protection work was also done so as to protect spring and pipe line.

REPRODUCED AT THE NATIONAL ARCHIVES

145

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Lone Cotton Wood Well
Other Names
Reservation Northern Navajo
Location Up Brimhall Wash 1½ miles W. Burnham Store, 2½ miles E to Charco Wash
Date Developed November 19 27
Flow in Gals. per minute:
Before Development Seep After 1¼

Development (or remarks)

This well was excavated down and into hard sand stone walled up and backfilled with gravel concrete slab over well with man hole and opening for a pump. A reinforced concrete trough constructed.

146

Name Sheep Spring #2
Other Names
Reservation Northern Navajo
Location Near spring #1 at Dustin Store 1 mile W. of Highway
Date Developed November 19 27
Flow in gals. per minute:
Before Development Seep After 3/4

Development (or remarks):

This seep was developed by means of excavating down and into shale, perforated pipe laid and backfilled with gravel filter and piped to concrete trough constructed when Spring #1 was developed.

REPRODUCED AT THE NATIONAL ARCHIVES

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Tsa-Skiesie Beyad To Spring
Other Names
Reservation Northern Navajo
Location 12 miles W. of Sweetwater

Date Developed November 19 27
Flow in Gals. per minute:
Before Development Seep After 1½

Development (or remarks)

This spring was excavated down in solid rock to a very porous sand stone, perforated pipe laid and backfilled with gravel filter, and piped to a reinforced concrete trough.

148

Name Many Horses Badoni Well
Other Names
Reservation Northern Navajo
Location 4 miles East of Burnhams store up Brimhall Wash

Date Developed October 19 27
Flow in gals. per minute:
Before Development None After 1

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter and piped to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Black Mans well
Other Names
Reservation Northern Navajo
Location ½ mile from Walker store, ½ mile west of east reservation line.
Date Developed October 19 27
Flow in Gals. per minute:
Before Development None After 3/4

Development (or remarks)

This spring was developed by way of opening seam in rock, and runs into a reservoir 10'x58x4 deep, covered with concrete slab and equipped with a man hole for domestic use, but no trough constructed.

Name Oliver Todo-Cozie Spring
Other Names
Reservation Northern Navajo
Location 8 miles south of East of Rock Point Store
Date Developed October 19 27
Flow in gals. per minute:
Before Development Seep After 1

Development (or remarks):

This spring was excavated down and through shale to hard limestone, perforated pipe laid and back-filled with gravel, and piped to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Olivers Well
Other Names
Reservation Northern Navajo
Location 7 miles NE Burnhams store, 7 miles West of east reservation line
Date Developed October 1927
Flow in Gals. per minute:
Before Development None After 1½

Development (or remarks)

This well was excavated down to a depth of 12' rock wall laid up and backfilled with gravel, concrete slab with man hole molded, and reinforced concrete trough constructed.

Name Dabies Well
Other Names
Reservation Northern Navajo
Location ½ mile east of Old sheep dip wash, 6 miles north of Burnhams store.
Date Developed September 1927
Flow in gals. per minute:
Before Development None After 3

Development (or remarks):

This well was excavated to a depth of 8', rock wall laid up and backfilled with gravel filter, concrete slab with man hole molded over top, and a reinforced concrete trough constructed.

REPRODUCED AT THE NATIONAL ARCHIVES

153

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Sweet Water Spring
Other Names
Reservation Northern Navajo
Location 1/4 mile from Cañoe and east side of Hogback and west side of Chaico wash
Date Developed September 19 27
Flow in Gals. per minute:
Before Development None After 1

Development (or remarks)

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter and piped to a reinforced concrete trough.

154

Name Willie Pinto Well
Other Names
Reservation Northern Navajo
Location 6 miles from table mesa and 6 miles east of Charco
Date Developed September 19 27
Flow in gals. per minute:
Before Development None After 1½

Development (or remarks):

This well was excavated to a depth of 12', rock wall laid, covered with a concrete slab with a man hole, and a concrete trough constructed.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Beca-she Well
Other Names Cow well
Reservation Northern Navajo
Location 7 miles NE of Burnhams store, 1 mile west of old Farmington road
Date Developed September 19 27
Flow in Gals. per minute:
Before Development None After 2

Development (or remarks)

This well was excavated to a depth of 10', rock wall laid up, concrete slab with man hole molded over top, and a reinforced concrete trough constructed.

Name Tsa-To spring
Other Names
Reservation Northern Navajo
Location 12 miles due E. of Denehotso, 2 miles E. of Chinlee Wash
Date Developed September 19 27
Flow in gals. per minute:
Before Development 1 After 1½

Development (or remarks):

This spring is near bottom of wash, excavated down into shale, backfilled with gravel filter, rock wall laid for flood protection, perforated pipe laid, and piped to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Depa-Bechan Spring
Other Names
Reservation Northern Navajo
Location 9 miles west of Rockpoint store on Kayenta Road

Date Developed September 19 27
Flow in Gals. per minute:
Before Development None After 1½

Development (or remarks)

This spring was excavated down into solid rock, perforated pipe laid and backfilled with gravel, and piped 840' to a reinforced concrete trough.

Name Rock Ear Ring Spring
Other Names Sa-Bega Gody
Reservation Northern Navajo
Location 9 miles E. of Big Willow Spring
14 miles N. of Thompsons Store
Date Developed August 19 27
Flow in gals. per minute:
Before Development ½ After 1

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter, a reinforced concrete trough constructed. Distance from spring to trough 270'.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Todo-Mui Spring
Other Names
Reservation Northern Navajo
Location 24 miles SE of Kayenta

Date Developed August 19 27
Flow in Gals. per minute:
Before Development 1½ After 1½

Development (or remarks)

This spring was excavated down and into shale with a storage basin holding about 3 barrels of water, pipe taken out near top of shale and piped to a reinforced concrete trough.

160

Name Alkali Seeps
Other Names
Reservation Northern Navajo
Location 17 miles SE of Dennehotso

Date Developed July 19 27
Flow in gals. per minute:
Before Development None After 2

Development (or remarks):

This spring was excavated down and into hard sandstone with a reservoir for storage, size of reservoir 20x8x9' deep, covered with logs, bark, and dirt, with a man hole. Water is piped from 3 ft. level to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Big Willow Spring
Other Names Rock Ledge
Reservation Northern Navajo
Location 14 miles NE of Tocito and 4 miles SE of Table Mesa

Date Developed August 19 27
Flow in Gals. per minute:
Before Development ½ After 3/4

Development (or remarks)

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter, a reinforced concrete trough constructed, distance from spring to trough 120'.

Name Stinking Water Spring
Other Names
Reservation Northern Navajo
Location SW of Tocito, head of Box Valley, and 3 miles N of Toadlena road

Date Developed July 19 27
Flow in gals. per minute:
Before Development 1½ After 2

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter and piped 150' to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name High Water Springs
Other Names
Reservation Northern Navajo
Location 5 miles south of Tocito and south side of Toadlena road
Date Developed July 19 27
Flow in Gals. per minute:
Before Development 1½ After 2½

Development (or remarks)

These springs, two in number, were excavated down and into original formation (shale), perforated pipe laid and backfilled with gravel filter and piped to a reinforced concrete trough.

Name Snake Spring
Other Names
Reservation Northern Navajo
Location 5 miles North of Toadlena, 300 yards E. of Toadlena Road
Date Developed July 19 27
Flow in gals. per minute:
Before Development ½ After 3/4

Development (or remarks):

This spring was excavated down into rock, rock wall laid for storage, no trough constructed.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Yellow Water Springs (two in number)
Other Names
Reservation Northern Navajo
Location 5 miles NW Two Grey Hills Store

Date Developed July 19 27
Flow in Gals. per minute:
Before Development ½ After 1

Development (or remarks)

These springs were excavated down and into shale, perforated pipe laid and backfilled with gravel filter, and piped to a reinforced concrete trough.

Name N-Dash a-Beta Spring
Other Names
Reservation Southern Navajo
Location 5 miles SE White Cone store and 9 miles NE Indian Wells under ledge facing north

Date Developed November 19 27
Flow in gals. per minute:
Before Development ½ After ½

Development (or remarks):

This spring comes out of a crevice in conglomerate formation, and flows into a small reservoir from which a pipe line 180' long connects with a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Clizza Slone Well
Other Names Many Goats Well
Reservation Southern Navajo
Location 3 miles East of Indian Wells, 1/4 mile N. of Ganado Road on left hand side of wash
Date Developed October 19 27
Flow in Gals. per minute:
Before Development None After 2

Development (or remarks)

This was excavated down to solid rock, rock wall laid up, a concrete slab with man hole molded over top, also a dumping box to pour water in pipe from box to a reinforced concrete trough. Distance from well to trough 60'.

Name Hawthorn Spring
Other Names
Reservation Southern Navajo
Location 9 miles NE Indian Wells at old abandoned trading post
Date Developed October 19 27
Flow in gals. per minute:
Before Development ½ After 3/4

Development (or remarks):

This spring had some development work done on it by traders years ago. It was further developed by excavating down and into solid rock, which furnishes a storage reservoir, size of reservoir 8x10x3½' deep. The original spring house over spring was not removed, water was piped to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Cow Spring
Other Names Beck-ashe spring
Reservation Southern Navajo
Location 4 miles E. of Indian Wells

Date Developed August 19 27
Flow in Gals. per minute:
Before Development Seeps After 3/4

Development (or remarks)

These seeps, three in number, were developed and connected into one line, and piped to a reinforced concrete trough. Distance from spring to trough 650'.

Name Clizza Bato Spring
Other Names Goat Spring
Reservation Southern Navajo
Location 3 miles E. of Indian Wells on Ganado Road

Date Developed September 19 27
Flow in gals. per minute:
Before Development Seep After 1-3/4

Development (or remarks):

This spring was excavated down to original formation (shale), rock wall laid up for storage reservoir, and piped to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Say Beto Spring
Other Names
Reservation Southern Navajo
Location 8 miles south of Indian Wells, 2 miles E. Steel bridge over Cottonwood Wash
Date Developed August 19 27
Flow in Gals. per minute:
Before Development Seeps After 1½

Development (or remarks)

These seeps were developed and concentrated to a basin, perforated pipe laid and backfilled with gravel filter and piped 375 ft. to a reinforced concrete trough.

172

Name Say Beto Yeshie Spring
Other Names
Reservation Southern Navajo
Location 1½ miles SE of Say Beto Spring
Date Developed August 19 27
Flow in gals. per minute:
Before Development Seep After 3/4

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and bakcfilled with gravel filter, piped 400' to a reinforced concrete trough.

REPRODUCED AT THE NATIONAL ARCHIVES

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name To-Do Cosh Chitty Spring
Other Names
Reservation Southern Navajo
Location ½ mile south of Clachinas Rock House

Date Developed July 19 27
Flow in Gals. per minute:
Before Development None After 3/4

Development (or remarks)

This spring was a mere seep before development, excavated down and into shale, perforated pipe laid, backfilled with gravel filter and piped to a concrete trough. Distance from spring to trough 220'.

174

Name Kit Seely Spring
Other Names
Reservation Southern Navajo
Location 1 mile south of Todo Cosh Chitty spring

Date Developed July 19 27
Flow in gals. per minute:
Before Development Seeps After 1½

Development (or remarks):

These seeps, four in number, were excavated down and into shale, perforated pipe laid, backfilled with gravel and connected to one line, and piped to a reinforced concrete trough. Distance from spring to trough 800'.

REPRODUCED AT THE NATIONAL ARCHIVES

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Old Murphy Spring
Other Names Musca Spring
Reservation Southern Navajo
Location 9 miles SE Indian Wells

Date Developed June 19 27
Flow in Gals. per minute:
Before Development Seep After 1/8

Development (or remarks)

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter, and piped to a concrete trough. Distance from spring to trough 225'.

176

Name Murphy Well
Other Names
Reservation Southern Navajo
Location 9 miles SE Indian Wells

Date Developed July 19 27
Flow in gals. per minute:
Before Development None After 33 1/3 gal. per hour

Development (or remarks):

This was an old abandoned well used for watering stock several years ago. The casing in this well is in good condition, size of casing 6". This well was cleaned out sand pumped down and into cook strainer. It may be necessary to do further development work on this well as the strainer may be very badly corroded.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Moencopi Secret Spring #1
Other Names Ceremonial spring
Reservation Western Navajo
Location Between Day School and Village

Date Developed October 19 27
Flow in Gals. per minute:
Before Development 3 After 3

Development (or remarks)

This spring flows from a large crevice in sandstone collected in reservoir and piped to a concrete trough. Overflow from trough is used for irrigation of garden.

Name Moencopi Spring #2
Other Names
Reservation Western Navajo
Location On road from Day School to Village

Date Developed November 19 27
Flow in gals. per minute:
Before Development Seep After 3

Development (or remarks):

This spring or seep was at side of road, excavated down and into shale, trench filled with gravel filter and piped to a fountain in village. Overflow to be used for irrigating gardens.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Do-Nagada Spring
Other Names Black Mt.
Reservation Western Navajo
Location 12 miles east of Cow Springs

Date Developed October 19 27
Flow in Gals. per minute:
Before Development Seep After 1½

Development (or remarks)

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel, and piped 125' to a reinforced concrete trough.

Name Cla Chee Spring #2
Other Names
Reservation Western Navajo
Location 8 miles east of Cow Spring

Date Developed October 19 27
Flow in gals. per minute:
Before Development Seep After 1

Development (or remarks):

This spring was excavated down and into sandstone, perforated pipe laid and backfilled with gravel. A reinforced concrete trough constructed. Distance from spring to trough 35'.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Cla Chee Spring #1
Other Names
Reservation Western Navajo
Location 35 mi. NW of Kaibeto

Date Developed September 19 27
Flow in Gals. per minute:
Before Development 1½ After 2

Development (or remarks)

This spring was excavated down and into Porous sandstone, perforated pipe laid and backfilled with gravel and piped 200' to a reinforced concrete trough.

Name Gishi Beta Spring
Other Names
Reservation Western Navajo
Location 6 mi. NW of Red Valley Trading Post.

Date Developed September 19 27
Flow in gals. per minute:
Before Development Seep After 3

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter, and piped 35' to a reinforced concrete trough.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Bert-Tso Spring
Other Names
Reservation Western Navajo
Location 4 miles N of Kaibeto

Date Developed August 19 27
Flow in Gals. per minute:
Before Development Seep After 1

Development (or remarks)

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter, and piped 100 ft. to a reinforced concrete trough.

184

Name Many Horses Spring
Other Names
Reservation Western Navajo
Location 12 miles N. of Red Lake and 1 mile from what is known as Hole in the Rock

Date Developed September 19 27
Flow in gals. per minute:
Before Development Seep After 1

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel, a reinforced concrete trough constructed. Distance from spring to trough 375'.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Roy Naz Spring
Other Names
Reservation Western Navajo
Location 6 mi. E. of Kaibeto

Date Developed July 19 27
Flow in Gals. per minute:
Before Development Seep After 1

Development (or remarks)

This spring was excavated down and into sandstone, perforated pipe laid and backfilled with gravel filter, and piped to a reinforced concrete trough. Distance from trough to spring 400'.

186

Name Ata Sinnem Spring
Other Names
Reservation 7 miles south of Kaibato (Western Navajo)
Location

Date Developed August 19 27
Flow in gals. per minute:
Before Development Seep After 1 gal.

Development (or remarks):

This spring or seep was excavated down and into shale, perforated pipe laid and backfilled with gravel filter, and piped 250' to a reinforced concrete trough.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Big Butte Spring
Other Names
Reservation Western Navajo
Location White Mesa 15 miles SE of Kaibeto

Date Developed July 19 27
Flow in Gals. per minute:
Before Development 2 After 2

Development (or remarks)

This spring is down in a Canon on bank of wash. It was necessary to build a stone and cement wall to protect from flood waters. No concrete trough constructed as there was no suitable place available.

188

Name Ta Chine Badoni Spring
Other Names
Reservation Western Navajo
Location 10 miles East of Kaibeto

Date Developed July 19 27
Flow in gals. per minute:
Before Development Seep After 1

Development (or remarks):

This spring was excavated down and into sandstone for storage capacity. A stone and cement wall laid up and built high enough to protect from flood waters. This spring is for domestic use;as there was no place available for concrete trough, none was constructed.

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189

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Burnt Corn Spring
Other Names Sand Spring Nah-dan-delet Spring
Reservation Hopi
Location 9 miles N.E. Pinon Store, near head of Nah-dan-delet wash.

Date Developed March 19 28
Flow in Gals. per minute:
Before Development ½ After 1-3/4

Development (or remarks)

This spring was excavated down into original formation (shale), perforated pipe laid and backfilled with gravel filter; distance from spring to trough 400 ft. The trough is of reinforced concrete with capacity of 700 gal.

190

Name To-ya Nostladi Spring
Other Names
Reservation Hopi
Location 9 miles E. of Pinon store high up on side of Mesa

Date Developed April 19 28
Flow in gals. per minute:
Before Development 1½ After 3

Development (or remarks):

This spring was excavated down and into sand (very coarse) perforated pipe laid, backfilled with gravel filter, piped to a reinforced concrete stock watering trough.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Hostodi To Spring
Other Names Hopi
Reservation
Location 19 mi. N.E. of Polacca on Polacca & Chinlee
north side of road
Date Developed April 19 28
Flow in Gals. per minute:
Before Development 3/4 After 1¼

Development (or remarks)

This spring was excavated down and into shale, perforated pipe laid, backfilled with gravel filter, and piped 90 feet to a reinforced concrete stock watering trough.

192

Name Clean Nakedi Spring
Other Names Bucking Horse
Reservation Hopi
Location

Date Developed May 19 28
Flow in gals. per minute:
Before Development ½ After 1

Development (or remarks):

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter, and piped 150 ft. to a reinforced concrete trough.

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193

NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name To-Hoakle Spring
Other Names
Reservation Hopi
Location 2 mi. N.W. of Hostodi To and 4 miles E. of Clyde Polacca Place
Date Developed May 19 28
Flow in Gals. per minute:
Before Development ½ After 3/4

Development (or remarks)

This seep was excavated down and into shale, perforated pipe laid and backfilled with gravel filter, and piped to a reinforced concrete trough; distance from spring to trough 180 ft.

194

Name Cla-Chai Beto
Other Names Dog Spring
Reservation Hopi
Location 2½ mi. N.E. of Polacca, and north of Polacca and Chinlee road
Date Developed May 19 28
Flow in gals. per minute:
Before Development ½ After 1

Development (or remarks):

This seep was concentrated to a bowl, perforated pipe laid and backfilled with gravel, piped 180 ft. to a reinforced concrete stock watering trough.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Estla Spring
Other Names
Reservation Hopi
Location 22 mi. N.E. of Polacca & 1½ miles south of road to Chinlee at N.E. end of Mesa
Date Developed May 19 28
Flow in Gals. per minute:
Before Development 1/4 After 3/4

Development (or remarks)

This seep was developed by means of concentrating water in shale ditch, perforated pipe laid and back-filled with gravel filter; distance from spring to reinforced concrete watering trough 125 ft.

196

Name Clare Gaas Spring
Other Names
Reservation Hopi
Location 8 mi. N.W. of Low Mt. Store
Date Developed June 19 28
Flow in gals. per minute:
Before Development 3/4 After 1¼

Development (or remarks):

This spring was cleaned out, perforated pipe laid, backfilled with gravel filter, piped to a storage tank built of stone masonary, size of reservoir 10'x10'x5' deep and thence piped from reservoir to a reinforced concrete stock watering trough.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

Name Rock Spring
Other Names
Reservation Western Navajo
Location 7 mi. N.W. of To Ha Chee Spring and 28 mi. N.W. of Red Lake
Date Developed March 19 28
Flow in Gals. per minute:
Before Development ½ After 1¼

Development (or remarks)

This seep was discovered near edge of waterfall in wash on shale bed, excavated down and into shale, filled with gravel filter and piped to a reinforced concrete stock watering trough.

198

Name Moencopi Spring #3
Other Names
Reservation Western Navajo
Location 7 mi. S.E. of Moencopy village on road to Coal mine.
Date Developed Feb. 19 28
Flow in gals. per minute:
Before Development None After 1

Development (or remarks):

This seep was excavated down and into shale, perforated pipe laid, backfilled with gravel, and piped to a reinforced stock watering trough.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

199

Name To Ha chee spring
Other Names
Reservation Leupp
Location 21 mi. N.W. of Red Lake

Date Developed March 19 28
Flow in Gals. per minute:
Before development ½ After 1¼

Development (or remarks)

This spring was excavated down and into shale, perforated pipe laid and backfilled with gravel filter and piped to a reinforced concrete stock watering trough.

200

Name Nocki Baa To spring
Other names
Reservation Leupp
Location 15 mi. W. of Red Lake

Date Developed Jan. 19 28
Flow in gals. per minute:
Before Development Seep After 2

Development (or remarks)

This seep was at foot of sand drift, excavated down and into shale, depth of sand 8 ft., dug trench in shale, laid perforated pipe, backfilled with gravel filter, and piped water to two reinforced concrete troughs.

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NAVAJO AND HOPI SPRING DEVELOPMENT
FIFTH IRRIGATION DISTRICT

201

Name White Water well
Other Names
Reservation Leupp
Location 12 mi. N.W. of Red Lake

Date Developed Feb. **19** 28
Flow in Gals. per Minute:
Before development ½ **After** 1½

Development (or remarks)

This well was excavated down and into shale for storage capacity, size of well 5'x8'x10' deep. Well covered with reinforced concrete slab, with man hole, a reinforced concrete trough constructed.

202

Name Tonalea
Other Names
Reservation Western Navajo
Location

Date Developed June **19** 1928
Flow in gals. per Minute:
Before Development **After**

Development (or remarks)

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