ANNUAL REPORT

FISCAL YEAR

1912.

OFFICE OF INDIAN AFFAIRS
RECEIVED
AUG 6 - 1912
78294

H. F. ROBINSON
Superintendent of Irrigation.

ALBUQUERQUE N.M. · JULY 1912 ·

CV-6417-201 NN012639

I N D E X .

[illegible] of Territory,		1
Comparative,		1
Map of,	Plate	I
[illegible]ian water, possibility of,		17
[illegible]ndita, Navajo.		9
[illegible]iti,		12
(See Pueblos).		
[illegible] Data Sheets. Southern Ute,	Plate	XVI
Zuni,	Plate	XVII
Navajo and Moki,	Plate	XVIII
Southern Ute, Diminished,	Plate	XIX
Pueblos,	Plate	XX
Water Resources,	Plate	XXI
[illegible]ditures, Distribution of,		
Total,	Plate	IIIa
Zuni,	Plate	IIIb
Navajo-Moki,	Plate	IIIb
Southern Ute,	Plate	IIIc
Southern Ute Diminished,	Plate	IIIc
Water Resources,	Plate	IIId
Pueblos,	Plate	IIId
[illegible]ployees,		21
[illegible],		1
[illegible]ds,		6
[illegible]gical Survey, report and maps of,		16
[illegible] Canal, Floods,		6
Report of work,		7
Cost Data,	Plate	XVIII
[illegible]an Labor,		5
On Hogback Canal.		8
[illegible],		14
(See Pueblos).		
[illegible]er Conditions,		5
[illegible], Indian,		5
On Hogback Canal,		8
[illegible]una,		13
(See Pueblos; and Mesita Dam).		
[illegible]os River,		
(See Southern Ute Diminished Reservation).		
[illegible].		
Cultivated Lands, Southern Utes,	Plate	VI.
Southern Ute, Construction,	Plate	VII.
Tuba,	Plate	VIII.
Irrigated Lands, Zuni.	Plate	IX.
San Ildefonso Pueblo,	Plate	X.
Well Drilling Operations, Map of,	Plate	XI.
Log of Wells drilled, Rig No. 2,	Plate	XII.
Rig No. 3, contd.	Plate	XIII.
Rig No. 3,	Plate	XIV.
Rig No. 4,	Plate	XV

Maps, contd.
Territory, Plate I.
Mesita Dam, destroyed by floods, 6
(See Laguna).
Moenoopi Wash, flood in, 6
(See Tuba).
Montezuma Valley Irrigation District, proposition of, 11
(See Southern Ute Diminished),
Morrison Ditch, purchase of, 9
Navajo.
(See project name).
Navajo-Moki, Distribution of Expense, Plate IIIb
Cost Data Sheet, Plate XVIII
Office of H. F. Robinson, 2.
Paguate, 13
(See Pueblos).
Personnel of Employees, 3
Changes in, 4
Photographs
Drop on Zuni Canal, Facing page Title.
Trench and Cut Off Wall, Zuni, " " 5
A Zuni field, " " 5
Indian Laborers, Ridgback Canal, " " 6
Headgate during Flood, " " 7
Type of Metal Flume, " " 9
San Felipe Ditch, " " 13
Improvised Pile Driver, " " 13
Lateral Ditch and Zuni Fields, " " 14
End of Dam and Spillway wall, Zuni. " " 15
Trench and Wall, Zuni. " " 15
A Field Lateral, Zuni. " " 16
Well, Windmills, Tanks and Troughs, " " 17
"Toveski Spring", " " 18
"Ishpi Spring", (2 plates). " " 19
Building up end of Zuni Dam, " " 20
Steel Flume, " " 21
Pueblos, In territory, 1
, Work in, 4
Report of, 12
Distribution of Expenditures, Plate IIId
Cost Data Sheet, Plate XX.
Rabbit Ditch, 11
Reports, List of, 2
Reservations in territory, 1
Work in, 4
Rio Grande, floods in, 7
River Protection,
At Shiprock, 8
At San Felipe, 13
At Cochiti, 12

Shiprock, 8
Spring Creek Canal, 9
Spring Creek Extension Ditch, 9
Springs,
(See underground water development).
Southern Ute, Allotted, 9
Distribution of Expenditures, Plate IIIc
Cost Data Sheet, Plate XVI.
Southern Ute Diminished Reservation,
Map of ditch Plate VII.
Map of cultivated land, Plate VI.
Report on, 11
Distribution of Expenditures, Plate IIIc
Cost Data Sheet, Plate XIX.
Santa Clara, 12
(See Pueblos).
San Felipe, 12
(See Pueblos).
San Ildefonso, 14
(See Pueblos).
San Juan River, floods in, 6
(See Hogback Canal).
Taos, 13
Travel, of H. F. Robinson, 1
Diagram of, Plate II.
Territory, 1
area of, 1
Reservations and Pueblos in, 1
Map of, Plate I.
Tesuque, 13
(See Pueblos).
Tohatchi, 9
Underground Water, Development of, 16
Water Resources Investigation, 7
Distribution of Expenditures, Plate IIId
Cost Data Sheet, Plate XXI.
Well Drilling. (See Underground water development)
Rigs, 17
List of good wells, 18
Map of, Plate XI.
Western Navajo,
(See Moencopi and also Tuba).
Wells, 19
Location of, 4
Report of work, 14
(See photographs).
Runoff of watershed, 15
Progress Profile, Plate V.
Distribution of Expenditures, Plate IIIb
Cost Data Sheet, Plate XVIII

Annual Report.
Fiscal Year 1912.
J. F. Robinson,
Superintendent of
Irrigation.

5—1143

DEPARTMENT OF THE INTERIOR

UNITED STATES INDIAN IRRIGATION SERVICE

SUPERINTENDENT OF IRRIGATION

Albuquerque, N. M., July 12, 1912.

Mr. John J. Granville,
Acting Chief Engineer,
526 Federal Building,
Los Angeles, Cal.

Sir:

I herewith submit my annual report for the Fiscal Year 1912.

TERRITORY, TRAVEL AND FORCE.

The territory, the operations in which are included in this report, which is under my jurisdiction, comprises Northeastern Arizona, New Mexico and Colorado, including the following Reservations and Pueblos:

Reservations.	Pueblos.
Navajo,	Taos,
[illegible],	Picuris,
[illegible],	San Juan,
[illegible],	Santa Clara,
Mescalero Apache,	San Ildefonso,
Jicarilla Apache,	Nambe,
Southern Ute (Allotted),	Tesuque,
Southern Ute, Diminished Reservation,	Cochiti,
Navajo, Allotted. (Pueblo Bonito).	Santo Domingo,
	San Felipe,
	San Dia,
	Santa Ana,
	Zia,
	Jemez,
	Isleta,
	Laguna,
	Acoma.

The combined areas of these reservations and grants is 14,116,041 acres the population 35,786.

This area given in bald figures does not mean much, but comparing it other well known tracts its size is more apparent. For instance: Delaware, Connecticut, Rhode Island, New Jersey and the District of Co-

this section, carried out practically every bridge in three counties, and was estimated that the repairs on the Fourth Division of the D. and R. G. necessitated by these storms and floods would exceed One Million dollars.

In December high water did damage along the Rio Grande, and delayed river otection work then under way at San Felipe and at Cochiti. During May and ne 1912, the Rio Grande reached the maximum stage of the past quarter cen- ry and did some damage to Indian ditches and to Indian lands along the river.

TER RESOURCE INVESTIGATION.

Under direction of your office, special investigations were made with ference to possible water storage and water power sites that the same might withdrawn from entry under the Act of Congress of June 25, 1910, and a ll report was made of the three months special investigation on November h 1911 and a supplementary report a few days later.

No projects of any magnitude were found, and no recommendations for thdrawal of lands were made excepting in the case of Taos, as all other ojects were entirely within the boundaries of the various reservations.

VAJO. <u>Hogback Canal.</u> <u>San Juan.</u>

During the past year practically no new work has been opened up on this oject. At the close of the last fiscal year there was considerable work ich had been started but was incomplete. Then came the floods with the companying damage and the entire work of the year has been confined to the ad section and building the cutoff already mentioned and miscellaneous ork in the first six miles of the canal.

After the damaging floods the Chief Engineer detailed Inspector Hill the work, and after a thorough examination the additional work necessitated

the damage and the changed conditions were decided upon and directed to done.

Trouble has been encountered in getting the Navajos to work steadily. From November to March plenty of labor was available, and as large a force possible was worked, in an endevor to make a fair average for the year, the pay roll running from $4,000to almost $7,000 per month. The balance of the year the Indians are busy with their flocks and their farming and it is very hard to get them to the work.

Considerable river protection work was found necessary to protect the canal and to repair flood damages. This has also been done, and considerable more will probably prove necessary during the coming fiscal year.

Details of the amount of the different classes of work and the cost can be taken from the cost data sheets which form a part of this report.

At the head of the Shiprock or School ditch the river changed its channel and threatened serious damage to the school property. The Office directed that such river protection work be done there as was necessary to protect the property. The order for this work came just at the time when the Indians had left for their homes, and great difficulty was experienced in getting labor. The conditions of continued high water has made it very difficult and costly to secure the necessary material of rock and brush. The work was not completed at the end of the fiscal year and an additional authority for its continuance will be necessary to continue the work.

WESTERN NAVAJO.

The dam in the Moencopi Wash which was damaged by floods as already related, was looked over by the acting Chief Engineer and myself, in the spring, and plans made for its repair. Owing to the amount of work on hand, and the

limited number of men available to put in charge of construction work these repairs have not been made, but it is hoped they will be early in the new fiscal year.

TONCITA NAVAJO.

It was hoped that a chance existed for storing water for this little band of Navajos under the Albuquerque School jurisdiction, and an examination was made early in the year. Two reservoir sites were found but neither of them would justify the cost of construction.

NAR TOHATCHI.

Investigations were made of a proposed reservoir site near Tohatchi N. M., and a careful examination shows that it would take a dam 80 feet high for a storage of 3000 acre feet of water; that there was no living water; the amount of storm water was problematical and that the cost of the project would run to about $63 per acre. Under the conditions and the questionable amount of water available, I reported adversely.

SOUTHERN UTE. (Allotted).

About the beginning of the last fiscal year, authority was granted to purchase what was known as the Dr. Morrison Ditch on the west side of Pine River, which was to be enlarged to carry water to allotted lands of the Southern Ute Indians.

This ditch, which it is claimed, has cost in its present condition, about $23,000. was purchased for $15,000. Deeds were prepared and an abstract furnished which was submitted to the Indian Office. Since that time, the papers have been returned several times, and at present, the sale has not been concluded as the still will not pass muster at the office of the Attorney General. The additional information andcorrections now asked for will

UNDERGROUND WATER DEVELOPMENT.

The most important work being conducted in this section is undoubtedly the development of underground water in the Navajo and Moki Reservations.

Thsi country is what is known as the "Painted Desert" region, and is extremely arid.

The scanty and unfavorable distributed rainfall, great areas of drifting sands, vast lava beds, irregular topography of mesas and canyons, brilliant sunshine, drying winds, all are factors in making this a region of unsatisfactory and megre water supply.

The absence of any considerable streams in this region, the small rainfall and almost entire precipitation during April, May, June and often into July precludes placing dependence on rainfall to supply water for stock or for irrigation.

Because of these conditions it was determined to develop water over such parts of the country as would be possible, by means of well drilling and the development of springs and seeps where practicable.

Two years ago a well rig was put in the field, and later a second one of less size and capacity was built, for use in smaller and shallow wells. The success met with was so encouraging that two more were authorized during the past year, were constructed and put into the field, and a fifth has just been decided upon for work in the Pueblo region of New Mexico.

It is difficult to predict where water will be secured, though it is often very evident where it cannot be found, and often the most promising site will prove to have no underground water.

The examinations made by the Geological Survey, and the special maps furnished by them have been of great assistance, but the predictions made

CV-6417-201 NN012648

have not always been verified.

The well drilling rigs in the field have been numbered. Rig No. 1, which has a capacity up to 18" in diameter and a depth of 1500 feet, has been at Keams Canyon at work on a deep well to test out the theory of the Geological Survey that there is Artesian water in this part of the country. The prediction was made that when the drill penetrated the shale and entered the Dakota Sandstone flowing water would be found, and judging by the average thickness of the shale in the sourrounding country it was estimated that th this would be about 700 feet thick.

Not reaching the bottom of the shales at 800 feet, I wrote Prof. H. E. Gregory who had made the examination and upon whose judgement the work was undertaken, and in reply I had a letter in which he says:

"To my mind, it is highly important to sink this well entirely through the shales and through the Dakota. It will pay even if the well is a failure, for a failure here will mean that the deep rock wells in the region of the Moki villages and elsewhere about the southern edge of the Black Mesa are likely to be dry. If, however, flowing water is secured from the Dakota at Keams Canyon, it is highly probable that wells sunk to this horizon anywhere along the southern edge of the Black Mesa will be successful".

Work was continued, and is now 1,000 feet deep. Additional cable has been secured and the work will be continued until water is encountered or it is proven that there is no artesian water in this section.

The other three rigs have a capacity up to 5" in diameter and 150 to 200 feet in depth, but all of the holes now being put down are 3½".

Rig No. 2 has been putting down shallow wells in the vicinity of the Hopi villages. A map showing the location of all wells drilled and logs of all holes, both dry and good wells are made a part of the report and are annexed hereto.

Rigs 3 and 4 were finished and in the field by November. No. 3 was

sent to Zuni first where six good wells were secured. It was then transferred to the Navajo country, south and west of Canado. Rig No. 4 has been working in the Chin Lee valley.

These three rigs have put down 42 wells during the year, of which 23 have proven good wells, most of them developing from 350 to 500 gallons per minute. It is planned to equip each of these wells, and all future good wells, with a windmill, a storage tank and troughs for sheep and cattle.

LIST OF WELLS WHICH HAVE PROVEN GOOD.

In the Navajo-Hoki country.

No.	Discharge.	Fitted with:
203	600 gals per minute	Pump windmill concrete tank, troughs.
204	550 gals per minute	Pump, windmill, concrete tank, troughs.
205	400 " " "	" " " " "
206	200 " " "	" " " " "
209	600 " " "	" "
213	400 " " "	" "
214	75 " " "	"
216	500 " " "	" " " "
310	240 " " "	"
311	190 " " "	"
402	70 " " "	" windmill
403	300 " " "	" "
404	420 " " "	" "

On the Zuni Reservation.

301	800 gals per minute.
302	400 " " "
303	25 " " "
305	250 " " "
306	240 " " "
309	good well - discharge not reported.

These wells are much appreciated by the Indians, and during the past season many thousand head of sheep and cattle have watered at them.

Considerable new grazing territory has been opened up, and a number of Hopi families have moved down from the Mesa as a consequence.

CV-6417-201

NN012652

NN012653

CV-6417-201

During the year mills have been errected, concrete or stone tanks built and lines of troughs set for wells Nos. 4, 5, 6, 7, 9 and 14 drillrd last year.

The pumps are set and windmills errected by the drillers, while the tanks have been built and the troughs set by the man in charge of the spring development. The work is now getting so scattered that it will be necessary to put in an additional crew to construct tanks and follow up the drillers. It will soon be necessary to provide a man or men to look after the errected mills, as they need attention and oiling at frequent intervals if they are to last and do the work.

The spring development has not gone on as rapidly as it would otherwise on account of dividing the time between this particular work and the tank construction.

During the year ten stone or concrete tanks have been built at the wells, and trough made and set.

At the second mesa, work was continued on the springs. Six small springs at Shimopavi, near the top of the mesa, were cleaned out, but it was impossible to develop additional water. These springs are used during the winter and spring, but in the summer are dry, and water is carried from the foot of the mesa.

At this point the spring, known as the "Macepi Spring" is located near the day school. This spring was developed, the water conducted through a pipe to a stone tank 5' x5' x 5' for domestic use and the overflow led to a line of troughs about 100 feet away.

Work has been commenced on the main spring at Mishongnivi (located at the Moreva day school), which will be completed at an early date. This spring is about the largest one in this s ection, and is in a most filthy condition.

As it is one of their ceremonial springs considerable difficulty has been encountered in getting them to allow the work to be done, and trouble was feared at one time. However, Mr. Womack's diplomacy won them over and they are now eager to have the work completed.

"Toveski Spring" is located on the west side of the First Mesa. This spring was in a draw and it was necessary to build a wall to prevent surface flow from entering. The spring was excavated and walled up, and a flight of stone steps built to the water, and troughs set for watering stock.

"Ishpi Spring" is the main spring of the First Mesa and lies on the east side. This spring was cleaned out and walled up, and the flow was increased fully 100%. The flight of stairs necessary to reach the water were entirely enclosed to prevent the filth from the village dump from blowing in. The Indians now have clean water in these two springs for the first time in generations, and the supply is increased. Last summer the supply was so scanty that the women would sit around the spring waiting for a little water to seep in that they could dip up in a cup or gourd, and it would often be hours before they could get a load.

This year there has always been an abundant supply, and the storage which accumulates over night will almost supply the village during the day.

A second spring at this point, which has been reserved to supply the government field matron's cottage was cleaned and the pipeline put in shape to carry a supply of water.

About a mile and a half north lies "Wacatova Spring" which was developed by excavation into the solid material of the hill and the water pumped to a large stone tank and troughs.

A few other smaller springs have been put in shape. Mr. Womack has

NN012655

lso built ten stone and concrete tanks at various wells, and has the material n hand for a number of others to be built soon.

MPLOYEES.

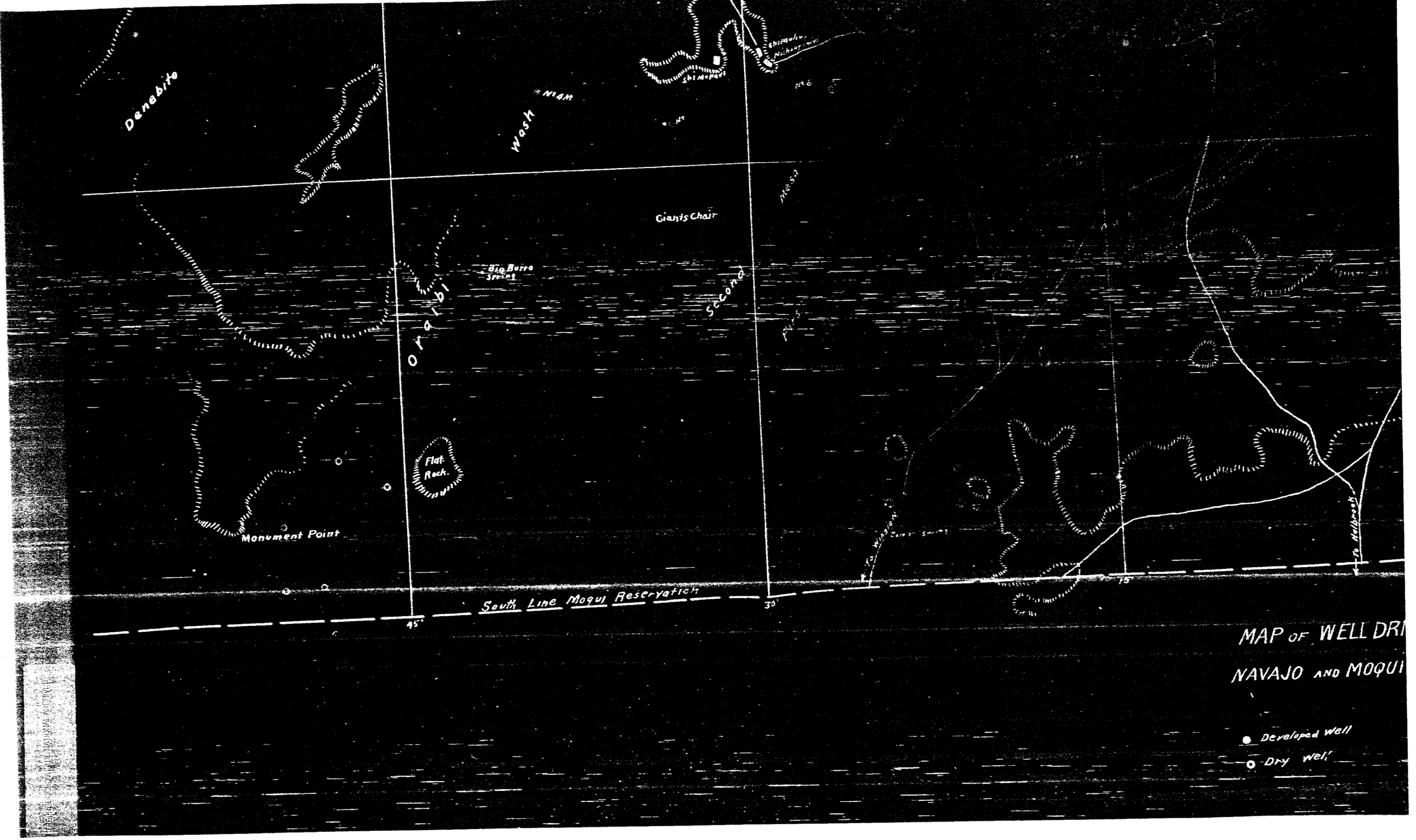
I again wish to acknowlege my indebitness to the employees under me for he efficient and faithful way in which they have done the tasks assigned to hem. With employees scattered over such a large territory, where they an be visited and the work inspected at considerable intervals of time, there every chance for them to show the metal they are made of, and I can say hat without exception they have done the best possible under the circumstances nd have given good faithful services.

There are annexed hereto photographs, maps, diagrams and cost data sheets hich form an important part of this report.

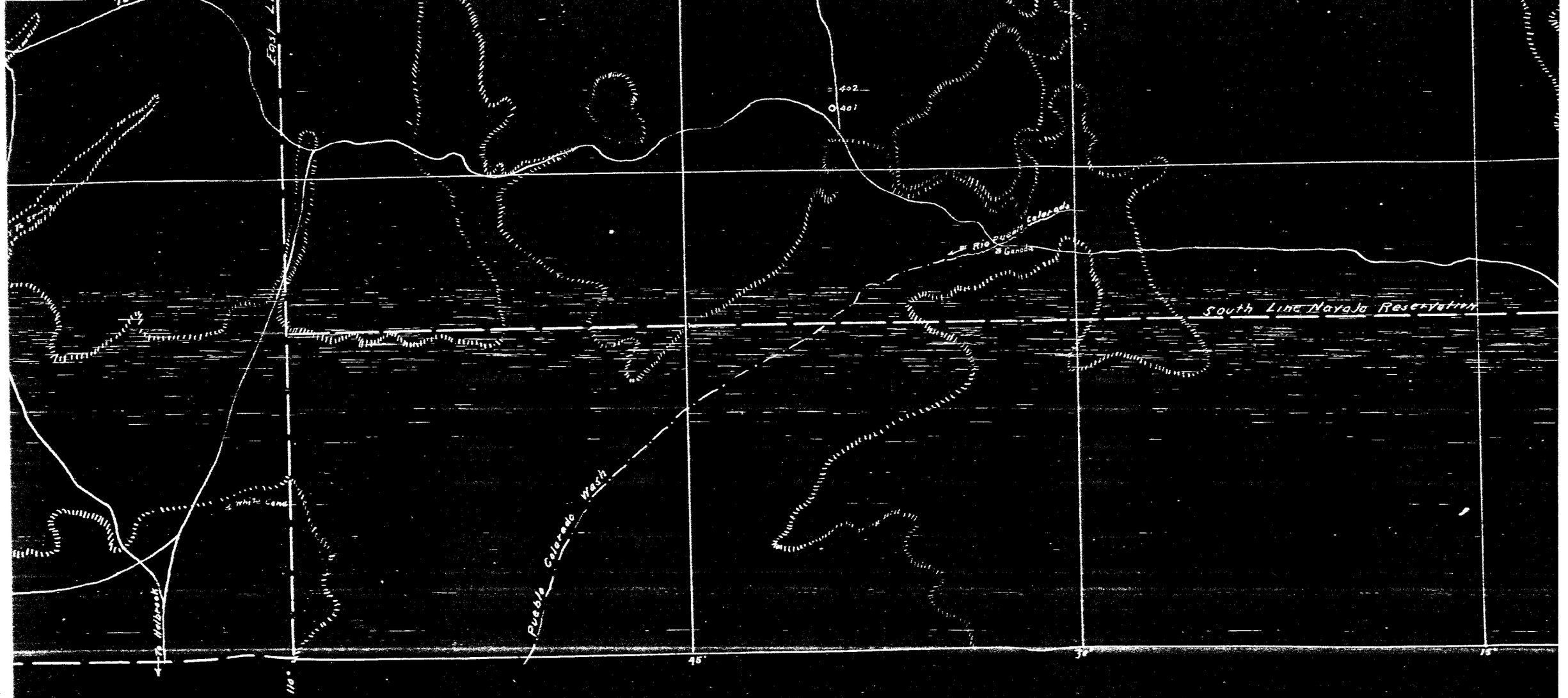
Very respectfully,

F. H. Robinson

Superintendent of Irrigation.



NN012657
CV-6417-201



OF WELL DRILLING OPERATIONS

O AND MOQUI RESERVATIONS

H.F. Robinson

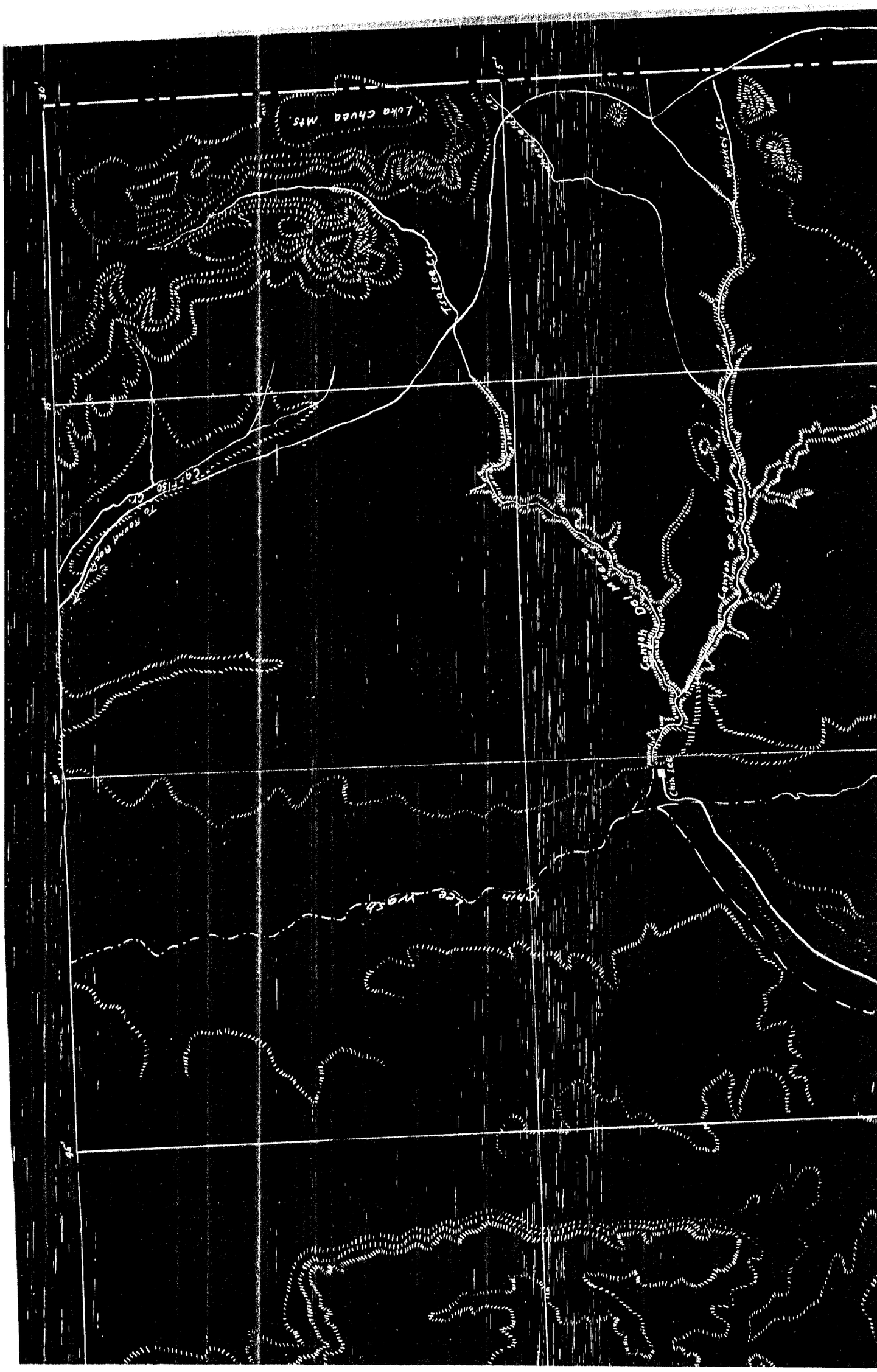
Supt. of Irrig.

ped well

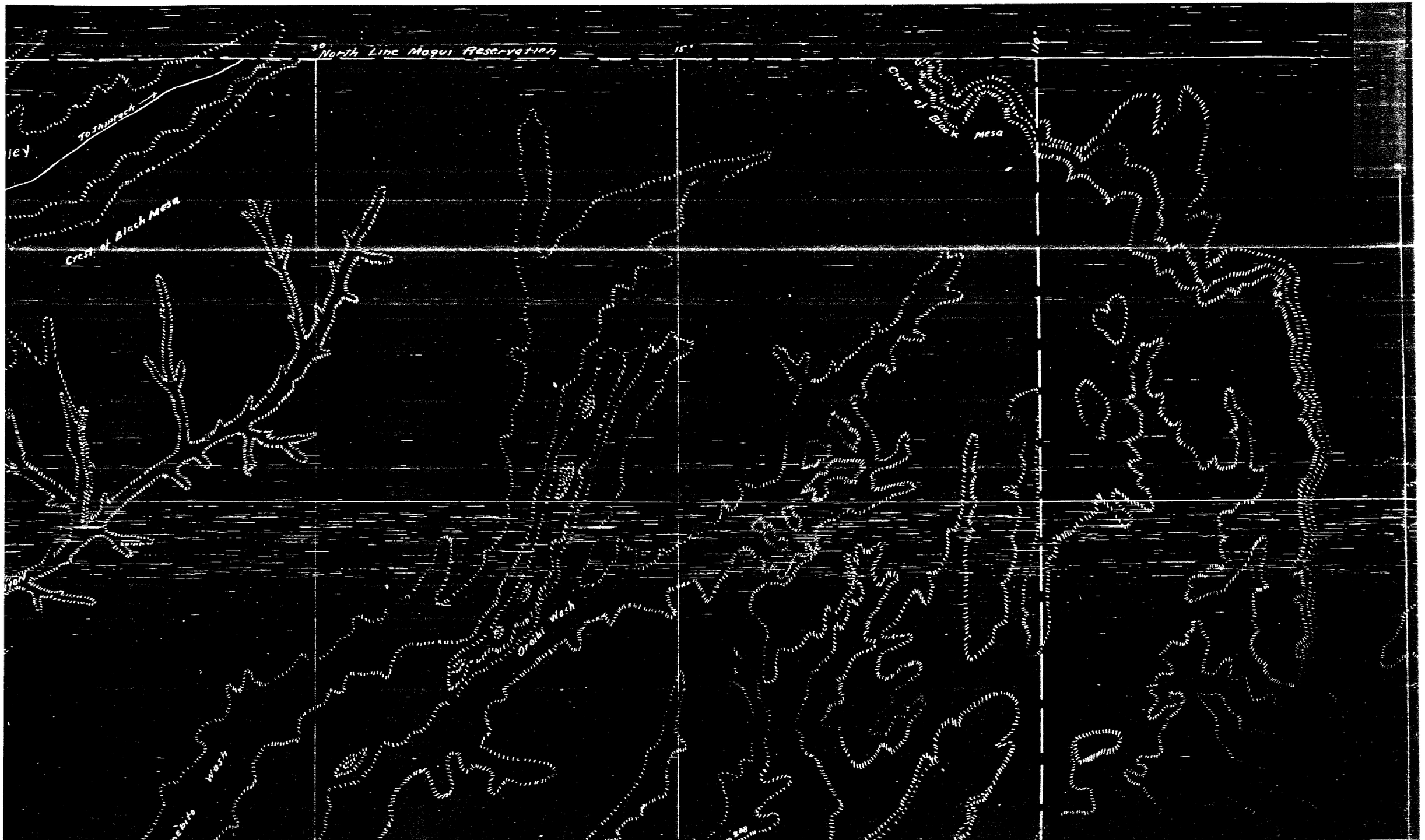
well

NN012658

CV-6417-201


Luka Chuca Mts.
Tsa Lee Cr.
Carriso Cr.
To Round Rock
Canyon Del Muerto
Canyon De Chelly
Chin Lee
Chin Lee Wash
30'
15'
45'

CV-6417-201



NN012660