

DEPARTMENT OF THE INTERIOR, UNITED STATES INDIAN IRRIGATION SERVICE.

69

Reservation Navajo & Moqui State Ariz. and New Mexico Project Well Drilling
 Total area reservation 11,976,983 Tribes Navajo & Moqui Total census in 19 10, 27,711

LOCATION AND CLIMATIC CONDITIONS.
 County Apache, Navajo, Coconino in Arizona, San Juan and McKinley in New Mexico
 Townships and ranges
 Railroads on and adjacent
 Railroad stations
 Market for products
 Average elevation irrigable area
 Average elevation water shed
 Average rainfall on irrigable area
 Average rainfall on water shed
 Range of temperature on irrigable area

See OVER

WATER SUPPLY.
 Source of water supply
 Area of drainage basins in square miles
 Annual run-off in acre feet

SUMMARY OF RESULTS.
 Present available reservoir capacity
 Reservoir acre feet
 Reservoir acre feet
 Canal miles
 { With capacities in second-feet
 More than 500
 From 250 to 500
 From 50 to 250
 Less than 50
 Tunnels
 { Number
 Total length
 Size

WASTE DITCHES AND DRAINS.
 Mile capacity sec. feet
 Mile capacity sec. feet
 Storage dams, volume, cubic yards
 { Masonry
 Earth
 Rockfill
 Diversion dams, volume, cubic yards
 { Masonry
 Earth
 Rockfill
 Crib
 Dikes or levees
 { Total length, feet
 Volume cubic yards
 Number of canal structures (exclusive of dams and tunnels, but including bridges, culverts, pipes, flumes,
 { Costing over \$2,000 each,
 { Masonry
 { Concrete
 { Wood
 { Costing from \$500 to \$2,000 each,
 { Masonry
 { Concrete
 { Wood
 { Costing from \$100 to \$500 each,
 { Masonry
 { Concrete
 { Wood
 { Costing less than \$100 each,
 { Masonry
 { Concrete
 { Wood

Bridges	Number	Length 50 feet or more Length less than 50 feet	Steel.	Combina- tion.	Wood.	Concrete.
Total length, feet						

C rts
 { Concrete number length
 { Wood number length
 { Metal number length

PIPE.
 Concrete feet laid cost
 Metal feet laid cost
 Terra cotta feet laid cost
 Wood feet laid cost

FLUMES.
 Concrete, number size
 length cost
 Steel, number size
 length cost
 Wood, number size
 length cost

BUILDINGS.
 Number of offices cost
 Number of residences cost
 Number of power plants cost
 Number of pumping stations cost
 Number of barns cost
 Number of warehouses cost

WELLS.
 Number
 { Aggregate depth
 { Aggregate cost

ROADS.
 Miles constructed
 Aggregate cost

TELEPHONE LINES.
 No. stations aggregate cost miles

TRANSMISSION.
 Miles constructed aggregate cost
 Water power
 { H. P. developed
 { Development cost per H. P.
 Material excavated, Class
 { 1. Cubic yards cost
 { 2. Cubic yards cost
 { 3. Cubic yards cost
 Riprap, cubic yards cost
 Masonry, cubic yards cost
 Dry wall, cubic yards cost
 Concrete, cubic yards cost
 Cement, bbls. used cost

IRRIGABLE LANDS.
 Estimated cost of completed project
 Estimated area for completed project in acres
 Area which can be supplied from constructed works without additional construction
 Irrigated at present time by
 { Indians acres
 { Whites
 { Owned acres
 { Leased acres
 Total cost of project to date
 Total amount paid for labor
 { Indian
 { White
 Average value of irrigated lands

Approved: DECEMBER 31, 1914. 191
H. F. ROBINSON Supt. of Irrigation.
 Project Engineer.

WELL DRILLING ON THE NAVAJO AND MOQUI RESERVATIONS

The well drilling on these reservations is for developing domestic and stock water, with the exception of No. 1 which is exploring for artesian water for the purpose of irrigation. All other wells too small to furnish irrigation water.

The following is the record of the wells. Navajo & Moqui

Rig No.	Time of operation	Good Wells		Dry Holes or bad water	
		Holes	Ft. Drilled	Holes	Ft. Drilled
2	Fiscal year 1912	8	708	15	1169
	" " 1913	6	533	15	1097
		14	1241	30	2266
3	" " 1912	12	924	1	90
3	" " 1913	7	516	5	637
3	" " 1914	2	263	7	774
3	" " 1915			7	876
		21	1703	20	2377
4	" " 1912	3	352	1	116
4	" " 1913	10	410	2	68
4	" " 1914	6	205	5	188
4	" " 1915	3	164	5	298
		22	1131	13	670
Grand Total		57	4075	63	5313

Rig No. 1 put down a hole 1308 feet deep at Keams Canyon in 1912-13 and is now located in the Choiska Valley about 9 miles from Tohatchi. Here the rig put down two 5½ inch holes, 294 255 feet deep respectively, for the purpose of securing water for the outfit while prospecting. The deep well has been drilled to the depth of 454 feet.

No. 2 has been in operation a short time during the fiscal year of 1915, on maintenance work.

DEPARTMENT OF THE INTERIOR, UNITED STATES INDIAN IRRIGATION SERVICE.

38

Reservation Navajo & Moki State New Mexico Project Well Drilling
 Total area reservation 11,976,083 Tribes Navajo & Moki Total census in 19 10 27,711

LOCATION AND CLIMATIC CONDITIONS.

County Apache, Navajo and Gonaonino
 Townships and ranges _____
 Railroads on and adjacent A. T. & S. P.
 Railroad stations Callup N. E. & Williams, Ariz.
 Market for products _____
 Average elevation irrigable area _____
 Average elevation water shed _____
 Average rainfall on irrigable area _____
 Average rainfall on water shed _____
 Range of temperature on irrigable area _____

WATER SUPPLY.

Source of water supply _____
 Area of drainage basins in square miles _____
 Annual run-off in acre feet _____

SUMMARY OF RESULTS.

Present available reservoir capacity _____
 Reservoir _____ acre feet
 Reservoir _____ acre feet
 Canal miles $\left\{ \begin{array}{l} \text{With capacities in second-feet} \\ \text{More than 500} \\ \text{From 250 to 500} \\ \text{From 50 to 250} \\ \text{Less than 50} \end{array} \right.$ _____
 Tunnels $\left\{ \begin{array}{l} \text{Number} \\ \text{Total length} \\ \text{Size} \end{array} \right.$ _____

WASTE DITCHES AND DRAINS.

Mil capacity _____ sec. feet _____
 Miles capacity _____ sec. feet _____
 Storage dams, volume, cubic yards $\left\{ \begin{array}{l} \text{Masonry} \\ \text{Earth} \\ \text{Rockfill} \end{array} \right.$ _____
 Diversion dams, volume, cubic yards $\left\{ \begin{array}{l} \text{Masonry} \\ \text{Earth} \\ \text{Rockfill} \\ \text{Crib} \end{array} \right.$ _____
 Dikes or levees $\left\{ \begin{array}{l} \text{Total length, feet} \\ \text{Volume cubic yards} \end{array} \right.$ _____
 Number of canal structures (exclusive of dams and tunnels, but including bridges, culverts, pipes, flumes, $\left\{ \begin{array}{l} \text{Costing over } \$2,000 \text{ each,} \\ \text{Costing from } \$500 \text{ to } \$2,000 \text{ each,} \\ \text{Costing from } \$100 \text{ to } \$500 \text{ each,} \\ \text{Costing less than } \$100 \text{ each,} \end{array} \right. \left\{ \begin{array}{l} \text{Masonry} \\ \text{Concrete} \\ \text{Wood} \\ \text{Masonry} \\ \text{Concrete} \\ \text{Wood} \\ \text{Masonry} \\ \text{Concrete} \\ \text{Wood} \\ \text{Masonry} \\ \text{Concrete} \\ \text{Wood} \end{array} \right.$

		Steel.	Combina- tion.	Wood.	Concrete.
Eridges	Num-ber,	Length 50 feet or more			
	ber,	Length less than 50 feet			
	Total length, feet				
C	rts	Concrete	number	length	
		Wood	number	length	
		Metal	number	length	

PIPE.

Concrete feet laid _____ cost _____
 Metal feet laid _____ cost _____
 Terra cotta feet laid _____ cost _____
 Wood feet laid _____ cost _____

FLUMES.

Concrete, number _____ size _____
 length _____ cost _____
 Steel, number _____ size _____
 length _____ cost _____
 Wood, number _____ size _____
 length _____ cost _____

BUILDINGS.

Number of offices _____ cost _____
 Number of residences _____ cost _____
 Number of power plants _____ cost _____
 Number of pumping stations _____ cost _____
 Number of barns _____ cost _____
 Number of warehouses _____ cost _____

WELLS.

Number _____ $\left\{ \begin{array}{l} \text{Aggregate depth} \text{ See over} \\ \text{Aggregate cost} \end{array} \right.$

ROADS.

Miles constructed _____
 Aggregate cost _____

TELEPHONE LINES.

No. stations _____ aggregate cost _____ miles _____

TRANSMISSION.

Miles constructed _____ aggregate cost _____
 Water power $\left\{ \begin{array}{l} \text{H. P. developed} \\ \text{Development cost per H. P.} \end{array} \right.$

Material excavated, Class $\left\{ \begin{array}{l} \text{1. Cubic yards} \\ \text{2. Cubic yards} \\ \text{3. Cubic yards} \end{array} \right.$ cost _____

Riprap, cubic yards _____ cost _____
 Masonry, cubic yards _____ cost _____
 Dry wall, cubic yards _____ cost _____
 Concrete, cubic yards _____ cost _____
 Cement, bbls. used _____ cost _____

IRRIGABLE LANDS.

Estimated cost of completed project _____
 Estimated area for completed project in acres _____
 Area which can be supplied from constructed works without additional construction _____

Irrigated at present time by $\left\{ \begin{array}{l} \text{Indians} \\ \text{Whites} \end{array} \right.$ $\left\{ \begin{array}{l} \text{Owned} \\ \text{Leased} \end{array} \right.$ acres _____

Total cost of project to date _____

Total amount paid for labor $\left\{ \begin{array}{l} \text{Indian} \\ \text{White} \end{array} \right.$ _____

Average value of irrigated lands _____

Approved: _____, 191

Project Engineer.

Supt. of Irrigation.

Well Drilling on the Navajo and Moki Reservations.

The well drilling operations on these reservations is for the purpose of furnishing domestic and stock water, and not for irrigation. The amount of water furnished by each well is too small for the latter purpose.

The following is a statement of the work done by each of the Drilling rigs.

Rig No.	Time of operation	Good wells		Dry wells or Bad water	
		Hole	Feet drilled	Hole	Ft. drilled
2	Fiscal year 1912	8	708	18	1169
	" " 1913	6	533	15	1097
		14	1241	33	2266 (242)
3	Fiscal year 1912	12	924	1	90
	" " 1913	7	516	5	637
	" " 1914			2	138
		19	1440	8	915 (323)
4	Fiscal year 1912	3	352	1	116
	" " 1913	10	410	2	68
	" " 1914	No wells completed			
		13	762	3	184 (417)
Grand Total		46	3442	44	3365

Total amount charged to rigs

Rig No. 1	26,685.01
Rig No. 2	6,776.72
Rig No. 3	16,055.85
Rig No. 4	17,079.28

66,576.86 Total to date.

The small amount of work for the fiscal year 1914, due to the appropriation being confined to the Navajo Reservation and being too small to keep both rigs in operation for the year.

Rigs NO. 1 & 2 Moki reservation, 3 & 4 on the Navajo reservation.