

P. 48 of log
Annual Reports
1929

1301

4

and as is shown elsewhere in this report, all of the seventeen pueblos have more or less agricultural land and do irrigation; the ditches for the most part being of great antiquity as most of them were constructed generations ago and many of them before the coming of the white man in the 16th Century. The work has consisted largely of building small structures and giving assistance in repairs to their various ditches and structures in work that the Indians are unable to do for themselves. We have developed some additional supplies of water and are trying to improve those existing and to conserve such water as the Indians can get by means of better construction, lining sections of canal that are porous with concrete, eliminating certain sections of ditch that are on unfavorable land, building and keeping in repair small dams on tributaries of the Rio Grande from which they can get water, and similar work.

In the Navajo country an attempt is being made to assist the Indians in utilizing storm and flood waters to increase their agriculture. For generations the Indians have been planting corn and other food stuffs at the mouths of small

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washes or diverting from larger washes flood waters after storms to irrigate fields that lie along the stream bed. There are many places where the Indians have in the past secured fairly good results by this method but at the expenditure of great efforts in putting in temporary dams that are washed out every flood. We have been replacing these temporary structures with permanent structures, usually of concrete, where we felt the amount of water and land would justify such construction.

There are a few larger projects such as the Pine River Project in Southern Colorado for the Southern Ute Indians where we have about 15,000 acres; the Hogback Project in the Navajo country near Shiprock with about 4,000 acres and a possibility of extending the project to include 11,000 acres; the Ganado Project with about 1,700 acres, and the Zuni Project with a large area of land susceptible to irrigation where we are irrigating something over 4,000 acres of land with stored water.

In addition to this, a great deal of work is being done in developing stock and domestic water. In the pueblos, wells have been drilled in all of them that are equipped with windmills, tanks, and

GANADO PROJECT.

This project is located on the Navajo Reservation in Arizona about 60 miles northwest of Gallup, New Mexico. The water is diverted from the Rio Pueblo Colorado to a reservoir in a flat on the north side of the stream, the capacity of which is 4300 acre feet.

The project lands lie on both sides of the stream and the total area is 1700 acres, of which 707 acres are irrigated.

There are two non Indian water users on the project; J. L. Hubbell, who owns a homestead on the reservation, and the Ganado Mission. Mr. J. L. Hubbell receives water from the storage reservoir under a contract executed between the United States of America and himself, dated May 31, 1913. The following excerpt taken from the contract defines his right under the project:

"The party of the second part agrees to perform a proportionate share of the labor and to pay a proportionate share of the cost of material and supplies incident to, or necessary for, the proper operation and maintenance of the Ganado Irrigation System of the party of the first part, or in lieu thereof at the option of the party of the first part to pay such proportionate charges as may be fixed for the annual operation and maintenance of said system.

In consideration of faithful performance of the preceding stipulations of the party of the second part and of the conveyance of the property hereinbefore mentioned, the party of the first part agrees that the party of the second part shall have the right to sufficient water from said system for the proper irrigation of his above described lands, not to exceed two and one-half acre feet of water for each acre of land, and not to exceed four hundred acre feet of water in each year, or so much thereof as shall constitute the proportionate share per acre from the water supply actually available for the lands under the project.

It is mutually understood and agreed that, in the performance of labor, or the use of material and supplies, or the fixing of the annual charge for maintenance and operation of the system, the users of water therefrom shall contribute as the area of the land of each irrigated is to the total area served thereby."

As to the Ganado Mission rights the following is an excerpt from a letter from the Commissioner of Indian Affairs, dated September 27, 1919:

"A formal agreement, signed by the proper officers of the Home Mission Board, binding the organization to bear its proportionate part of the expense covered in the construction of the irrigation project and its operation and maintenance, should be submitted. It should be stipulated in such agreement that water may be refused upon failure to pay proper charges when due. To date the aggregate cost, per acre, of the project, as now estimated, slightly exceeds \$71.00. The irrigable

portion of the Ganado School lands, since the relinquishment of the ten acres, is only about 39 acres, as above list indicates."

From letter from Commissioner dated April 4, 1929:

"Our recommendation for the issuance of a patent contained no requirement that an agreement be signed before issuance of the patent, but set forth that the liability for payment of the proportionate construction charges would attach whether any reference thereto was made in the patent or not; the liability of the Mission Board being a matter of law. However, no requirement of payment has been made to date for the reason that the Navajo lands have not been allotted and, therefore, the proportions have not been established."

During the present fiscal year the annual spring cleaning was divided on an acreage basis. The Navajo Indians farming under the project cleaned their proportionate share of the canal; the Ganado Mission and Mr. J. L. Hubbell paid the Indians in cash for doing their proportionate share of the annual cleaning.

The amount paid by the Ganado Mission was \$164.98; by Mr. Hubbell \$503.39, and the amount done by the Indians \$271.31, making a total of \$939.74 in work done without cost to the Government.

The Indians on the Ganado Project have shown an unusual interest in the project affairs.

An association has been formed for the general advancement and instruction of the Indians on the project. Meetings are held on the 30th day of each month at which time a representative of the Irrigation Service meets with them and discusses items of interest and project affairs with the Indians. Most of the Indians have constructed permanent homes and have engaged in general farming rather than raising alfalfa which has been the rule heretofore. Some of the Indians have raised exceptionally fine gardens and a few are raising chickens and turkeys. It is the intention at the present time to build up a market whereby the Indians can raise poultry on a more profitable basis.

Sufficient water was stored on the project to meet the irrigation demands for the present season. The Indians have asked that the North ditch be extended to make more irrigable lands available. In this connection it will be necessary to have an additional allotment of some \$5,500. The Indians have volunteered to do a part of this work without cost to the Government.

CHIN LEE PROJECT.

This is a non-irrigation project and was for the development of an additional domestic water supply for the Chin Lee School.

At no time since the building of this school has the water supply been sufficient for their needs. Up to a few years ago the water was secured through a dug well on the edge of the wash, 10 or 12 feet deep and curbed with wood. This proving insufficient, the Irrigation Service assisted them in building another well somewhat larger in size, curbed with stone, on the outside of which was placed a two foot screen of gravel to assist the movement of water as the well was dug in fine sand just below the mouth of Canon de Chelly.

In an effort to develop additional water it was decided that the best chance was to lay a perforated infiltration pipe up the bed of the wash, the water emptying into the present well. A trench was excavated to a depth of 10 feet, one foot of gravel was placed on the bottom and an 8 inch perforated corrugated culvert pipe was then placed

and backfilled with several feet of screened gravel in order to afford a large infiltration area. To the present time this work has been entirely successful and it is furnishing an abundance of water for the use of the school.

It is possible, however, that during low stages of water or periods of drouth, or to keep up with the possible expansion of the school, this infiltration plant may have to be extended, and the pipe as laid was so left that it could be extended for any desired distance up the stream in the same manner without interfering with its continued use during the time.

CRYSTAL PROJECT.

This project is located thirty miles north of Fort Defiance, Arizona, in New Mexico. There are 700 acres of irrigable land under the project. Of this amount 600 acres are under cultivation. The Indians have been farming in this community for a great number of years (we having records of some repair work being done in 1904) and have had considerable trouble in diverting their water by the use of diversion dams which were carried out or damaged by each flood. The water supply for this project comes from the west slope of the Choiska mountains. There is an abundance of water except during the month of July. Usually during that month there is sufficient water to meet the demands with proper diversion facilities.

During the past season there was constructed a rock filled crib diversion dam, spillway crest 100 feet, spillway height 2 feet, abutments 6 feet in height; total cost of the dam \$5,000.

In addition to the dam there was

constructed 1400 lineal feet of concrete lined canal, 2000 feet of canal, and the enlargement and reconstruction of an additional 2000 feet of canal.

The diversion dam as constructed supplies water to the lands on the east and west side of Crystal Creek. A flume was constructed across Crystal Creek to supply the lands on the east side of the stream which were formerly irrigated by a diversion dam which was constructed some thirty years ago. This dam has deteriorated and is partly washed out. Some of the Indians were in favor of restoring the original dam but it was deemed advisable to place all of the lands under one irrigation project. The Indians farming under this project have been organized into a farm unit association and a ditchrider has been elected to take charge of the canals during the present year. It is hoped by this method of procedure that we will be able to get the maximum results obtainable on this project.

The Indians have donated work to the value of \$146.00.

The Indians recently held a meeting on

this project and are desirous of having the Government look into the possibility of providing storage water in order that additional lands which are available three miles below the project might be put under cultivation. No reservoir sites are known, but investigations will be conducted as soon as practicable.

INDIAN WELLS

Indian Wells is located 35 miles north of Holbrook, Arizona, in Section 7, T. 33, N. R. 21 E. This project was investigated at the request of Superintendent Balmer of the Leupp jurisdiction. A detailed topographic map was made of the proposed reservoir site and the irrigable area. The proposed reservoir would be located on the Lo-Kasa-Kad Wash, an ephemeral stream subject to torrential floods. Soundings in the stream bed show that there are from three to five feet of loose sand, shale, and gravel, and that the stream carries large quantities of debris, and any dam built across the stream bed would soon be filled to the height of the dam.

It further developed that it would be necessary to construct a dam sixty feet in height which would impound only 1344 acre feet of water, the estimated cost of which would be \$70,000.

In addition to the construction of the dam it would be necessary to build three miles of flume to carry the water from the dam site to the irrigable lands, otherwise it would be necessary to use the

stream bed as a common carrier and it is believed that on account of the porosity of the material encountered that all of the water released from the dam would sink into the stream bed.

The total estimate for this work was \$155,800. or \$120. per acre foot for water stored. The estimated life of the reservoir was five years.

A complete report was made on this project and it is not anticipated that any construction work will be undertaken.

KLEG-E-TOH PROJECT

Kleg-E-Toh is located 20 miles north of Chambers, Arizona, the railroad station on the A. T. & S. F. R.R., and 18 miles south of the Ganado Project.

A topographic survey was made of a reservoir and irrigable area of farm lands. The proposed reservoir will have a capacity of about 3000 acre feet of water. There is available 600 acres of land, most of which is now being cultivated by the Indians. A preliminary survey shows that this project can be constructed at a cost of about \$7,000.

There are 150 families living in this immediate vicinity and all have agreed to give labor and teams for the construction of the project without cost to the Government.

Plans and estimates for this project will be prepared during the month of July 1929.

MOENCOPI WASH - TUBA CITY

This project was constructed some fifteen years ago for the benefit of the Navajo Indians living below the school farm and for the irrigation of agricultural lands held by the Tuba City Indian School.

During the past season the headgates were replaced and a sluice gate installed in the diversion dam. A water bridge was constructed across the main canal to carry flood waters from the adjacent hill across the canal into the Moencopi Wash.

A detailed survey was made of the Indian School farm lands and a complete irrigation system laid out to facilitate their irrigation.

The total cost of the construction work was \$920.00; the estimate for the work, \$900.00.

RED LAKE PROJECT.

This is an old project, originally built prior to 1904. However, no use was made of it and it almost went to pieces. Between that date and 1927 this Service rebuilt it twice, but still no use was made of it.

The construction of a sanatorium and the proposed construction of a large hospital at Fort Defiance made it necessary to provide for a large dairy herd to furnish milk to the patients. The limit of irrigation for raising forage at the Fort had been reached, so thoughts were again turned to the Red Lake Project, about 15 miles distant. Forty acres were set aside for the above use, and the superintendent agreed that he would see that the Indians made proper use of the project, so money was made available to rehabilitate the project. This was done during the fiscal years 1927 and 1928. As finished, it can irrigate about 700 acres of land with the extension of a few small ditches. The Indians seem to be taking hold of a considerable area and the forty acres for the agency is being put under cultivation.

The project consists of a diversion dam, a feeder canal to the reservoir, which has a storage capacity of 4275 acre feet, and about five miles of distributing canal. At the end of this fiscal year there is about 2500 acre feet in the reservoir.

The Project has been visited several times during the present season and it seems to be properly functioning. It is under the management of the Superintendent of the Southern Navajo jurisdiction and not this Service.

NAVAJO AND HOPI WATER DEVELOPMENT.

As a separate branch of the work in this District, is the development of domestic and stock water on the Navajo and Hopi reservations. This is the development of existing springs and seeps; the drilling of wells, both shallow and deep, and by the latter is meant over 300 feet; the digging of shallow wells, which is really a development of a spring that lies so the water will not flow from it by gravity, and the building of storm water reservoirs or ponds.

Organization.

All of this work is under the direct supervision of General Foreman A. H. Womack. Under him as his immediate assistant is J. J. Schwarz. The working force is divided into various crews - as two crews, one with headquarters at Polacca and the other one at Chin Lee, who look after the operation and maintenance of the finished wells which are equipped with windmills, storage tanks, troughs for stock, etc.

There are two crews who have tractors and rotary scrapers who are building the tanks

or ponds, and from eight to ten other crews - varying with the season - who are developing springs.

At the beginning of the fiscal year we had bought seven light trucks for the use of various crews, and put on a new force of men. In order to get these trucks to the field, and to give certain instructions to the new men, they were called into the headquarters office and a little school of instruction, under Mr. Womack and Chief Clerk Albers, was held for a couple of days.

Cooperation.

The work of this water development was done under the closest cooperation with the Agency forces. Prior to the beginning of this year and at intervals, Mr. Womack, accompanied by the various superintendents, made trips over the reservation planning the work, mapping out a general plan for the year, which was to be followed as closely as possible. Contingencies which might arise from time to time would modify this, but so far as possible the original plan was adhered to, or if changed it was with the full approval of the superintendent. In this way the best distribution of the work,

and the development of water where it was most needed, was secured.

Mr. Womack submitted a report at the end of the year from which the following is taken, to show the viewpoint of the man in the field:

"You are aware of the long continued drouth in this Southwest country, also that on account of this continuous drouth all the stock is forced to concentrate at the permanent water which is the drilled wells and improved springs, which causes a congested condition and makes unusual demand on these permanent watering places. This, in turn, causes us to abandon our original plan in order to develop additional water near this overgrazed country. In some cases we have been forced to install gasoline pumping plant as an auxiliary water supply to keep stock from perishing, these or other conditions causing us to have to deviate from the original program, such as this: Reservation superintendents will suddenly find out that they have an appropriation to construct sheep dips, then we are called on to develop water as near the proposed sheep dip location as possible. In a case of this kind we call together the necessary equipment and men to do this.

The requirements for water supply for one of these plants is not only to supply water for dipping sheep, but as the sheep have to be dipped, and ten days later have to be dipped the second time, it is easy to understand that thousands of animals have to be held in this locality during this dipping period, therefore, using a great quantity of water which is considerably more than the usual spring will supply.

The superintendents fully realize the serious conditions of the grazing country, also the difficulty in providing water at all desired places, and they are reasonable in their requests for more water, also are constructive and cooperative.

However, the fact remains that the country is failing as a stock country at an alarming degree and every effort should be made to conserve the range in every way possible, not only by reducing the number of animals on it, but by scientific supervision of grazing, together with a sufficient amount of money to develop all the water possible and at the places where it will relieve the extremely overgrazed portions and allow some, at least, of the grass to mature and reseed the land. Not only is much of the grazing area kept grazed down to where it is prevented from developing seed, but is grazed down to the level of the ground the year round.

You will remember in our letter to General Scott on this subject (I think in 1915), I called his attention to the rapid destruction of the grazing land and expressed my belief that within a few years it would be reduced to a bad land and that there would commence the Real Indian Problem, and it is common knowledge in this country that since 1913 the increased stock has depleted much of the grazing land and there seems to be no relief in sight; however, the grazing seems to be the one resource of the Indian's existence.

I believe that this Government could do well in using some such scheme of reseedling as did the British Government in Australia as this is about the same elevation (semi-desert) and something near the same rainfall per annum."

As showing the detail of work by jurisdictions, the following summary is submitted:

Northern Jurisdiction.

On the Northern Navajo we operated two spring crews with equipment including truck, tents, small tools, scrapers, picks, and shovels, etc. We also have material shipped here and have storage for material and implements.

This jurisdiction has many more springs than any of the other jurisdictions as much of the Northern is located in what is called the San Juan Basin, which is a natural artesian country. On

this account anything that makes a break in the overlaying shale causes a spring to rise through the fault and this happens many times, especially along the major faults.

We have developed 36 springs and constructed concrete troughs at each, with the domestic storage away from the stock water; have dug 7 shallow wells which are walled up with a concrete slab top and in which is a heavy hinged lid.

Hopi Jurisdiction.

On this jurisdiction we have our headquarters camp including shop where we repair truck, automobiles, make forms for concrete, and issue all material for this jurisdiction.

We have one crew equipped with truck and tools which maintains 50 wells and windmills on this jurisdiction. We operated one spring crew the full year and had two other crews working part of the year who developed 10 springs and dug 12 shallow wells and at both the springs and wells reinforced concrete troughs were constructed.

Southern Jurisdiction.

In addition to maintaining 35 wells and windmills, we have operated two spring crews developing 18 springs with reinforced concrete troughs, and have dug 13 shallow wells which were walled up and covered with concrete slab with hinged door; also placed concrete troughs at each of them.

Water conditions on the Southern Navajo are greatly improved by the permanent water development although there is but a small percent of the work necessary completed along these lines.

Leupp Jurisdiction.

On this jurisdiction there was little money to operate on, therefore, only 4 reservoirs were made. These reservoirs were located in what is called the Diablo country, where there are no springs and money was not sufficient to drill wells.

However, there were 2 wells dug in other parts of the reservation and reinforced concrete troughs constructed.

The allotment for Leupp jurisdiction is always small as the allotment of funds is based on the population.

Western Jurisdiction.

During the last year we operated one reservoir construction crew on the Western jurisdiction. This camp consists of the following men and equipment: one foreman, one tractor operator, one laborer (Indian). The equipment consists of one tractor, one rotary scraper, truck, tents, camping equipment, and cook shack.

These reservoirs were constructed in order to supply stock water in a large area of the reservation where there are no springs and well drilling is impossible. There are 9 reservoirs constructed and the total earth moved on this reservoir work was approximately 23,847 cubic yards. In addition to this earth work there is the item of riprapping all the faces of these dams with slab stones. In some cases both sides of the dam were riprapped. This necessitated considerable work in getting the stone out.

There were two spring crews operating a part of the year who developed 10 springs and dug 12 shallow wells. At all springs and wells there is constructed a reinforced concrete trough.

The spring crew consists of one foreman, one assistant foreman, and the necessary Navajo laborers to carry on the work. The equipment consists of one truck, tents, scrapers, picks, shovels, and other small tools.

Eastern Jurisdiction.

On the Eastern Navajo we have had a duplicate of the construction outfit on the Western Navajo.

Owing to breakdowns in machinery, it has been necessary at times to quit work on the reservoirs, and the tractor crew was switched to the spring development work on the same jurisdiction. However, there were constructed 8 reservoirs with a total yardage of 20,000 cubic yards; this same party also dug 1 well, placing reinforced trough, etc.

This Eastern Navajo has but few springs and it will be necessary to continue the reservoir work, also to drill some wells as a permanent supply of water in order that in extremely dry times the stock can be moved to a permanent supply to prevent loss of herds.

S U M M A R Y

Springs Developed

No.Navajo	So.Navajo	West.Navajo	East.Navajo	Hopi	Leupp	
36	18	10	3	10	0	
						TOTAL 77

Reservoirs

Leupp		Western Navajo		Eastern Navajo	
4		9		8	
					TOTAL 21

Wells Developed

No.Navajo	So.Navajo	West.Navajo	East.Navajo	Hopi	Leupp	
7	13	12	1	12	2	
						TOTAL 47

I N D E XSprings and Dug Wells
Navajo and Hopi Reservations

1a	Jedito	Hopi
2a	Marty's	"
3a	Chief Spring	"
4a	Keams Canyon	"
5a	Walpi	"
6a	Tews Spring	"
7a	Shongopovi	"
8a	Wepo Spring	"
9a	Wacatova	"
10a	Solomy	"
11a	Tohadistoa	"
12a	Bradley's	"
13a	Todotai	"
14a	Denebito	"
15a	Denebito	"
16a	Bacoba	"
17a	Secota	"
18a	Ches-Keza	"
19a	Bacoba Spring No.2	"
20a	Tommy's spring	"
21a	Toreva spring	"
22a	Taylor's spring	"
23a	Burro spring	"
24a	Honana	"
25a	Ta-ho-not-a	"
26a	Pevait	"
27a	Cheskeza spring	"
28a	Chendeeto	"
29a	Seven Mile spring	"
30a	East Side spring	"
31a	Wacatova	"
32a	Cornfields spring	"
33a	Corner spring	"
34a	Chimopovi	"
35a	Clay spring	"
36a	Lucay Kad Top	No. Navajo
37a	Bekis Two Wells	"
38a	See Se Toa Well	"
39a	Wha Chee Yaza Well	"
40a	Etsidy Cli Baga. well	"
41a	Sheep spring	"
42a	Silent Man's spring	"
43a	ToToTum spring	"
44a	Wha Chee spring	"
45a	Cross Roads well	"
46a	E-Ghany spring	"
47a	Salt Water Well	"
48a	Barber spring	"

49a	Stinking spring	No. Navajo
50a	One Eye spring	"
51a	Sulphur springs	"
52a	Kla Chee Toh Wells	"
53a	Doby Begay	"
54a	Be-Jes-To spring	"
55a	Billy Be-Kinny	"
56a	Sun Water	Hopi
57a	Nes Nahe Beto	"
58a	Sand spring	"
59a	Drilled Well No.702	"
60a	Koney Nez spring	Leupp
61a	Castle Butte spring	"
62a	Government spring pipeline	"
63a	Dalki spring	"
64a	Adakai Iega spring	"
65a	Many Mules spring	West. Navajo
66a	Sagne E. So	"
67a	Tokes He Well	"
68a	Chee Reservoir	"
70a	Morman spring	"
71a	Gap Well	"
72a	Cottonwood	Leupp
73a	Shone-to	"
74a	Fring spring	"
75a	Say To spring	"
76a	Sunny spring	"
77a	Bush spring	"
78a	Mason spring	"
79a	Low Ki spring	Hopi
80a	Garia Nez spring	North. Navajo
81a	Red Sand Stone spring	West. "
82a	End of Wall spring	North. "
85a	Crow spring	Hopi
86a	Johns Well	North. "
87a	Buck-a-lin Bega Well	West. "
88a	To-Enchoni spring	"
89a	Well No. 213	Hopi
90a	Manson Well	West. Navajo
91a	Belena Bega Well	Leupp
92a	Poison Fern spring	North. Navajo
94a	Nah-John-Delet spring	Hopi
95a	Spotted Hard spring	"
11SJ	Te-La spring	No. Navajo
8 SJ	Frank W. Smith spring	"
3 SJ	Kimme Do-De-Tsie spring(2)	"
2 SJ	Georges spring	"
5 SJ	Sahaezly spring	"
12SJ	White Water	"
44SJ	Gleason Segal Well	"

45SJ	Sheep spring No.2	No. Navajo
46SJ	Hogan Say-any spring	"
47SJ	Tsa-Skiesie Beyad To spring	"
48	Lone Cottonwood Well	"
1	Bitter Seep spring	West. Navajo
2	Burro or Honani spring	Hopi
3	Cemotary spring	West. "
4	Chil Chin Beto spring	No. "
5	Cow Camp spring	Hopi
6	Devil spring	"
7	De-bo-Chady spring	No. "
8	Hole in the Rock spring	West. "
9	Ish-No-Gallie spring	Leupp
10	Kaibeto spring 1 & 2	West. "
11	Kaibeto Seeps 3 & 4	"
12	Koney Nez spring	Leupp
13	Rat spring	West. "
14	Red Lake Water Holes	"
15	Red Mesa spring	No. "
16	Sae-Es-Skeesie spring	Hopi
17	Saga-Nitso spring	West. "
18	Sand Stone spring	"
19	Say-Et-Sisie Seeps	"
20	Shan-to spring	No. "
21	Sheep spring	West. "
22	Taa-Pany spring	Hopi
23	Tan-E-Kis spring	No. "
24	Tanner Wash spring	West. "
25	Toh-La-Con spring	"
26	Tsa-Clizhin Beto spring	No. "
27	Tsa-Yo-To spring	"
28	Tsay-Ya-to spring	"
29	Walkers Seep	West. "
39	Chissey Yessie well	"
40	Drolet Well	So. "
41	Too Attley Well	No. "
42	Sheep Dip spring	"
44	To-No-Te spring	So. "
45	Sisohene Badoni spring	West. "
46	Side-to spring	"
47	Tachine Badoni	"
48	Inscription spring	"
49	Say Atho spring	"
52	To-Inchony spring	No. "
53	West Sheep Dip spring	"
54	Black Rock spring	"
55	Charley Curley spring	"
57	Mud spring	"
58	Sheep Dip well	"
59	Tank well	West. "
60	Murphy spring	So. "

61	Adakai spring	Leupp
62	Big Butte spring	West.Navajo
63	Roy Nez spring	"
64	Air Singer spring	"
65	Bert Tso spring	"
66	Many Horses spring	"
67	Cla Chee spring	"
68	Gishi Beta spring	"
69	To-tocosh spring	So. "
70	Kit Seale springs (3)	"
71	Saebeto spring	"
72	Say-Beto Yeshie spring	"
73	Cow spring	"
74	Clizza Beto spring	"
75	Beck-ashe well	West."
76	Dabies well	No. "
77	Willie Pinto well	"
78	Sweet water spring	"
79	Sacisy-to spring	"
80	Tsa-to spring	"
81	Depa Bechan Beto spring	"
82	Alakli Soeps	"
83	Tocito spring	"
84	High Water spring	"
85	Stinking spring	"
86	Yellow Water spring	"
87	Snake spring	"
89	To-Do-Mui spring	"
91	Rock Ear Ring spring	"
92	Big Willow spring	"
93	Clizza Slone spring	So. "
94	Tsida Tsai Beto spring	"
95	Moencopi Sacret No.1 spring	West."
96	Cla Chee spring No. 2	"
97	Do Nagada spring	"
98	Hawthorn spring	So. "
99	Todo Cozie spring	No. "
100	Be Daa spring	"
101	Black mans well	"
102	Olivers well	"
103	Many Horses Badoni well	"
104	Brimhall Wash spring	"
107	Moencopi Spring No. 2	West."
108	N-Desh-a Beto spring	So. "
109	Nooki-Ba-to spring	Leupp
112	White Water well	"
113	Rock spring	West."
114	Hopi spring No. 3	Hopi
115	Burnt Corn spring	"
117	Moencopi spring No. 3	West."
118	To-Ha-Chee well	"
119	To-Ya-Nastladi spring	Hopi

120	Hostodi Ko spring	Hopi
121	Cleen Nakadi spring	"
122	Estla spring	"
123	Cla Chai spring	"
124	To Hoakle spring	"
125	Clair Gee spring	"
126	Tonalea well	"
129	To La Chee spring	Leupp
131	Nava wells	No. Navajo
132	Bechan Kelly Well	Leupp
133	Wall spring	Hopi
134	Shosh Beto	So. Navajo
135	Many Whiskers well	West. "
136	To Na Leen well	"
137	Say Lachee spring	"
138	Tohaney Nez spring	"
139	Hogay To spring	So. "
140	Honagathne well	"
141	Tode Coz well	West. "
142	Toe Etsissie well	"
143	Joe Isaac Well	Hopi
144	Many Goats spring	"
145	Many Mules well	"
146	Salina springs No. 1	So. "
150	High Mt. spring	No. "
151	Saw Yazzie spring	"
152	Nocki To (2)	"
153	Tsa-Anea Woolly spring	"
154	Red Sheep spring	"
155	To-Denesjae spring	"
157	Cotton Wood spring	Hopi
158	Say Kole spring	"
159	Den Beto well	"
160	Trough spring	West. "
161	Gray Hat Charley well	"
162	Peach Tree spring	"
163	Sai spring	So. "
164	Salina spring No. 2	"
165	To Dis Caz spring	No. "
166	Sand Wash spring	"
167	Teece Beyad To spring	"
168	Lizzies spring	"
170	Sand spring	Hopi
171	Boiling spring	"
172	Clai Benalle well	"
173	Shanto canyon spring	West. "
174	John Smith well	"
176	White Rock spring	No. "
177	Iron spring	"
178	Little Shiprook spring	"
179	Juth Lachee spring	"

180	Dele Benalle spring	No. Navajo
181	Black Goats spring	"
182	Tohito springs (2)	So. "
183	Behito spring	"
184	To Jeel Kadi No.1 well	"
185	To Jeel Kadi No.2 well	"
188	Coyote well	West."
189	To Chine Bega well	"
190	Butler spring	"
192	Farm springs (3)	"
193	Say Sun well	"
195	Dynamite spring	No. "
196	Tohatchi spring	"
197	Toholee springs (2)	"
198	Cotton Wood spring	"
199	Crooked Tree spring	"
200	Flat Rock spring	"
201	Tode Coz spring	So. "
202	Tsa Lon spring	"
204	Tokes Jay spring	West."
206	Sunny Side spring	No. "
207	Willow spring	"
208	Poleman spring	"
209	Community spring	"
210	Chilibeto well	So. "
211	Chesenbeto well	"
212	Four wells	"
213	To Ladai spring	"
214	Black Mtn. spring (2)	"
215	Red Rock well	"
216	Nakai spring	No. "
217	San. spring	"
218	Old Policeman spring No.2	"
219	Greasewood spring	"
220	Tillman well No. 1	Hopi
221	Box Canyon well	"
222	Water in Wash well	"
223	Badger spring	"
229	Sayana Chee well No. 1	So. "
230	Sayana Chee well No.2	"
231	Lone well	No. "
232	Black Rock spring No.2	"
233	Red Rock wash spring	"
234	Black Rock spring No. 1	"
235	Blind Man well	Leupp
236	To-Hat-Chi spring	Hopi
237	Rough Mesa well	"
238	White Rock spring	"
239	Squaw Track well	"
240	Smiling spring	"
243	Tuckeliny well	"
244	Mountain well	"

245	To Hamia Well	Hopi
246	Blue Water spring	No.Navajo
247	Black Stump well	"
248	White Water well	"
249	Box well	"
253	Tsa Cleshie spring	So. "
254	Cove spring	"
255	Asona spring	"
256	Tso spring	"
257	Tode Cozie well	"
259	Rogers well	Hopi
260	Yellow spring	No. Navajo
261	Coal Mine spring	"
262	Black Peak well	"
263	Table Mesa well	"
264	Hoigegan spring	So. "
265	Straight Rock well	"
266	Burnt Corn No. 2	"
267	Bekay spring	"
270	Peach spring	Hopi
271	White Hat spring	"
272	Rim Rock spring	So.Navajo
273	Navajo spring	West."
275	Atsety well	So. "
276	Taos Pi spring	East."
277	Carson Cave spring	"
278	Judge Becentie spring	"

The springs and wells have been renumbered to correspond with the Cost numbers. This is a complete index of all springs and wells developed to date.