1923

ANNUAL REPORT
5TH IRRIGATION DISTRICT.

PART I.

IRRIGATION [illegible]

FIRST MESA WASH.

From time immemorial, the Hopi Indians have raised large crops of corn and other products in the valleys surrounding their mesas, by the spreading of flood water from the various washes on the sandy land.

Now, because of erosion, most of these washes are so far below the surface of the ground that this water is not spread by nature and cannot be diverted by the Indians as the depths now reached are too great for them to do the necessary work, which has assumed the nature of a considerable engineering problem.

Under date of January 31, 1923, a complete report was made you regarding construction work to divert water from the First Mesa Wash and spreading it over a considerable area of land below, allowing the Indians to use very similar methods to those followed in the days before the erosion had confined the water to one narrow channel.

This project was to build a dam of rather novel construction, using iron pipe for piling and masses of rock and brush confined with wire mesh. The plan was to build this is successive steps, allow-

ing the silt deposit to assist us in the construction rather than to allow it to form an obstacle against which we must fight.

This project was planned to cover at least 3000 acres of good land at a cost of approximately $30,000 or a cost of $9.75 per acre.

Since submitting the plan two other plans have occurred to me and as soon as possible to make a field examination, a report will be submitted covering one or both of these plans, should they be found feasible.

The great necessity of these Indians for additional land with water would seem to make some form of construction imperative and it is hoped that the Office will take the matter up and authorize either the construction of the plan submitted or some substitute therefor at an early date.

GRAND FALLS, ARIZONA.

An inquiry was made by Senator Ashurst of Arizona relative to a dam which might impound water of the Little Colorado below Winslow, for the benefit of the Navajo Indians.

This was investigated and a report made on February 12 and on April 9, giving information regarding a filing by Mr. Frank G. Baum on a damsite just above Grand Falls, near Tolchaco, by which he would flood a considerable area of land lying along the Little Colorado belonging to the Indians, which at the present time is not of great value but by the construction of the Canon Diablo Reservoir would all be placed under irrigation, and if flooded would ruin this latter project.

for full report see file Leupp 82663-14-377

Superintendent Janus advises that no permit be given for this reservoir, and also that steps be taken to build the Canon Diablo Reservoir. If it is desired not to build this latter reservoir the construction of the Grand Falls reservoir will not interfere with the rights of the Indians to any great extent. However, as this reservoir is in the channel of the Little Colorado, which carries a great amount of silt and sand, the reservoir would be very short lived.

It was recommended that if Mr. Baum or any successors he may have in the project be given a permit to construct this reservoir, that he be required to furnish a certain amount of water that may be used for the irrigation of Indian lands along the river below the falls.

MARSH PASS.

Under date of July 20, 1922, the Chief Engineer requested a report on the possibility of an additional supply of water for domestic purposes for the Marsh Pass School, the Office contemplating an enlargement of this school at an early date.

Mr. Womack was detailed and made a trip to this point. He reported that there is no question but what we can develop sufficient additional flow of water there to provide a school of any size; that there are two chances for getting water. One is the further development of water of springs in the sand hill back of the government farmer's cottage and that we can also develop any quantity of water desired by additional wells drilled at the school.

The old well rig which has been stored for several years is a little light and of poor design to go after water at that point, but with a comparatively few repairs and the purchase of a little equipment, it would be possible to use the rig and bring in as many wells as necessary.

MOENCOPI WASH.

A small amount of repair work on the ditch and wasteway of this project was done during the past year.

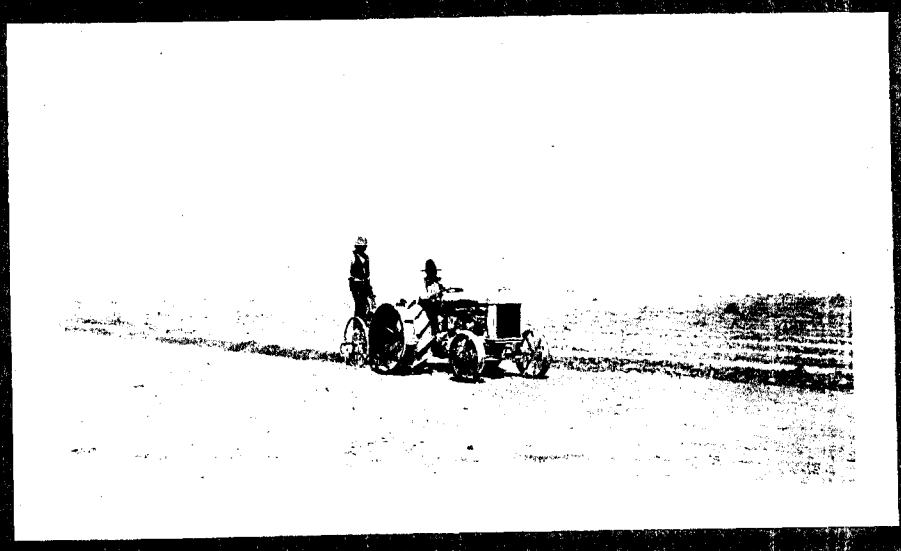
The river had begun to cut its banks just above the location of the sluice gate, threatening to destroy the canal. Rock and brush jetties were built to turn back the channel and some repairs made to the canal proper immediately above and below the wasteway mentioned.

TOLANI LAKES.

Under date of November 23, 1922, there was submitted a report for the construction of a dam across a valley about twelve miles north of Leupp, Arizona, which would conserve a large amount of water now going to waste, being the entire drainage of a large part of the Hopi and some of the Navajo Reservation and drained by what are known as the Keams Canon, First Mesa, Nepo and Oraibi Washes.

The water coming down these arroyos drains an area of approximately 2,300 square miles. Just above the proposed damsite all the waters of this drainage area have for years past collected into several small lakes, and the overflow has passed on down the valley, entering the Little Colorado near the Leupp School.

The precipitation on the drainage area is unknown, but it is believed that the rainfall will average from 4 to 6 inches in the plains to 15 in the higher mountains, andthat a conservative statement would be that the average annual rainfall is about 7 inches; although it is believed to be greater.



Seven inches of rainfall in this drainage area would amount to 870,000 acre feet, and if we assume that only 10% of this precipitation will reach the lower part of the drainage area, there will be at least 87,000 acre feet to be impounded in the reservoir.

The plan for the conservation of this water is the building of a low earth fill dike or dam across the valley some ten miles from the river, and the length of this dam would be between 3200 and 3600 feet on top, depending upon the height to which it was carried. I would refer you to the report above mentioned for details of the proposed construction.

A subsequent report was made under date of June 6, which gave you the result of the investigations in the saddle where it is proposed to construct the spillway. This was to determine the character of the material and amount of excavation for spillway at low dam heights. This report would modify the original plan of building the dam in several lifts, letting the silt deposit form a part of each succeeding lift, as the cost of excavating the spillway would exceed the amount saved

by building the two lower lifts separately.

With the construction of this project and a ditch not exceeding 2½ miles in length, 2500 acres can be put under cultivation and by the construction of another ditch, whose length has not been determined by actual survey, but estimated at perhaps ten miles, 10,000 or more acres of additional land can be brought under this project.

The Indians on the Navajo Extension (Leupp jurisdiction) have no irrigated lands, and only a small area of lands they can successfully cultivate by dry farming. They need the land and would make good use of it.

It has been proven that with only one or two irrigations large crops of corn can be raised in this valley. Using the seed of the corn grown by the Indians for generations, which is inured to dry conditions, but using modern methods and machinery for planting and caring for the land and crops and giving one irrigation from flood waters of this valley, Superintendent Janus of Leupp cultivated about 100 acres of land last year and produced better than 25 bushels to the acre. With

the same soil, climate and seed, and having better facilities for the distribution of water, if they could put in the 2,500 acres of land that could come under the first construction and raise only 20 bushels to the acre they could produce 50,000 bushels of fine corn which would sell in the markets in this country at an average of about two cents a pound, or $60,000 which in one year would go a long ways toward paying the entire cost of the project.

UNDERGROUND WATER DEVELOPMENT, NAVAJO AND HOPI.

In each annual report for a good many years, space has been taken in pointing out the necessity for the underground water development and the great good it has been doing for the Indians. It is believed that the Office is fully conversant with this phase of the question and space will not be taken up in reiterating these points.

Work has been continued throughout the year operation two drilling outfits, numbers Six and Seven, and two maintenance crews, one with headquarters at Chin Lee and one with headquarters at Polacca. The operation and maintenanc e is very important inasmuch as many of the wells supply all of the water for a considerable area of country and if one of them should fail even for a short time a large amount of stock and a considerable population would have to move out and force themselves on land already occupied by other Indians.

Each well and windmill is visited at least once a month and such repair and maintenance work as is necessary is done to each one. Detailed reports of this are sent in to this office and the records are such that we can go back over each

individual well and tell the date that it has been visited, and the amount and kind of work done thereon.

Mr. Womack has put in considerable time in other work in addition to the operation and maintenance, as he has the supervision of both well rigs and searches out the new tracts of country where drilling may be necessary or other work may be needed. He has made a number of trips that were not strictly for Indian water development, having been detailed to Tuba at one time to assist them to lay out the foundation for a water tank for the school and later to accept the completed work from the contracters.

A special trip was made to Kayente to inspect water conditions there, in compliance with instructions from the Indian Office, to give consideration to possible water development for school purposes.

Some time was spent at Chin Lee in assisting the superintendent in endeavoring to develop a water supply for the school. Mr. Womack also ran levels and made some tentative plans for a water supply for the Oraibi Day School.

Some spring development work was done in the Western Navajo jurisdiction near Red Lake.

Well Rig No. 6, which is working in the Crownpoint jurisdiction on the reservation, has not made as good a recordtthis year as usual for several reasons. In putting down Well 606 which was drilled to a depth of about 600', much trouble was had with the formation and in the loss of both tools and casing on several occasions.

Toward the end of March in working with a heavy string of tools, the derrick was broken and it was a couple of months before the new timbers were received. They were ordered for immediate delivery, but the bidder failed to make delivery and it was finally discovered that he had ordered the timbers from the Pacific coast and they were delayed in transit until a considerable amount of time had been lost. The well crew did not lie idle during this enforced rest however, but put the balance of the rig and outfit into shape, worked over well No. 104 which had ceased to flow, worked on several other wells, made exploratory trips to locate sites for other wells and did considerable road building that will be necessary during the year.

It was finally necessary to abandon the well No. 606 and the rig was moved a short distance

and a new hole started. This hole was taken to a depth of 690 feet and got a flow of 600 gallons per hour. The rig was working on well 608 at the end of the fiscal year. Burt S. Cravath, the driller for the rig, resigned in May and A. L. Manson was appointed to take his place.

The Indians donated about $200 in labor, hauling water and fuel for the rig.

Well Rig No. 7 put down over twenty holes. In September, by authority from the Indian Office, the rig was loaned to the Presbyterian Mission at Ganado to put down some wells for domestic water supply for the school and hospital located there. In December the rig was loaned to the superintendent in charge of the Navajo Agency to put down some holes at Chin Lee for domestic supply at that point. At the mission a good supply of water was secured, but at Chin Lee, owing to the fine formation, a sufficient supply of water could not be secured in a small drilled well. Plans were later submitted for putting down a dug well 16 feet in diameter and this was approved by the Indian Office to be put down during the coming fiscal year, when funds would be available therefor.

Following is a list of the wells put down by Rig Number Seven, with their depth and whether water was secured or not.

NUMBER	DEPTH	RESULT
729	430'	Dry
730	31'	Dry
731	55'	Dry
732	129'	Dry
733	138'	Dry
734	143'	Good
740	15'	Dry
741	20'	Dry
742	592'	Dry
743	42'	Dry
744	48'	Good
745	124'	Dry
746	80'	Dry
747	125'	Dry
748	130'	Good
749	98'	Dry

WEPO WASH.

A few years ago control of the flood waters of the Wepo Wash was undertaken, using low wire fences to cause the water to spread over the valley and to prevent erosion.

After observing this for several years it has been shown that the use of these low wire fences can be depended upon under certain conditions such as a part of the valley where the fall is not too rapid, or where there is a tendency through a sag in the ground to have the water concentrate and erode.

In or near the main part of the stream where the heavy current strikes it, this construction has not proved a success, owing to the fact that the waters of this stream are all flood runoff in character, bringing a large amount of weeds and other debris which pile against the fence quickly and cause the water to flow over the top, dropping on the lower side and cutting out holes sufficiently deep to undermine the posts. It a more permanent character of construction can be devised in the stream to partly spread the flood waters over the valley, they can be controlled

and directed very successfully with the construction under consideration.

So while the work done in the Wepo Wash along these lines has not been entirely successful it has demonstrated what can be done and has also been of considerable benefit to the area over which the work was done.