Proposed
Corn Creek
Project.
Arizona.

5-1142

DEPARTMENT OF THE INTERIOR

UNITED STATES INDIAN SERVICE

Irrigation

SUPERVISING ENGINEER
ALBUQUERQUE, N. M.

January 14, 1920.

Mr. W. M. Reed,
Chief Engineer,
Washington, D. C.

My dear Mr. Reed:

Some time ago my attention was called to the possibilities of cultivation at the mouth of what is known as Corn Creek, on the north side of the Little Colorado River, and almost opposite Leupp, a little over a mile and a half distant, but it was only lately that an opportunity for its investigation presented itself.

Corn Creek is an ephemeral stream that heads in the Hopi Reservation, south and a little east of Keams Canyon, draining all of the country of the neighborhood of what is known as Cedar Springs and as far south as Indian Wells.

About four miles above its mouth all of the drainage from the three big washes that come from around the three Hopi Mesas enter, and although practically all of the drainage of this immense territory is lost before reaching the Little Colorado, what does finally arrive there comes into Corn Creek and through its lower end into the river.

All along the river is a bottom land of from a few hundred yards to over a mile. Behind this is a higher bench, its elevation being from 8 to 20 feet above the bottom.

Much of this river bottom land, which lies only a few feet above the river bed, is sand, but at the mouth of Corn Creek the flood waters have wandered over a considerable area at different times and deposited a heavy layer of silt, and on this fertile silt land for many years the Indians have been in the habit of planting their corn, getting great results as the flood waters would usually furnish water for at least two good irrigations.

Of late years, owing to the excessive grazing on the head waters, and perhaps for other reasons, all of the washes and streams have been subject to greatly concentrated runoffs and consequently to greater erosion. The washes have been cut down and widened and all of the material eroded has been carried down the streams and deposited at places where the velocity of the water is checked. Throughout the valleys around the Hopi mesas where the flood waters were carried over the surface of the ground with scarcely the sign of a wash, within the last few years have been cut great arroyos several hundred feet wide and from ten to forty feet deep.

From this cutting, immense quantities of silt have been brought down within the past few years, and the summer rains have been depositing it on the growing crops of the Indians, planted here, and several years ago the Indians abandoned it as being too uncertain, or rather that the certainty was that when the corn was up a flood of mud would sweep over it and bury the crop.

Two years ago Superintendent Janus induced several of the Indians to again plant there, but when the crops were well up, a flood came down, the course of the stream was changed at right angles and the fields of growing corn were buried under from ten inches to two feet of mud. A hogan or Navajo house is still there with the mud deposited more than half way up the doorway.

Last year all of the agency teams were put to work, and with the help of the Indians interested, the channel of the creek as it came down on the bottom land was changed, and a dyke about 150 to 200 feet long was built and over 160 acres of fine corn and other products saved. That this land is productive is shown by the accompanying photographs taken by Mr. Janus last fall when the corn and other crops were being harvested.

It is found that after the first run of heavily charged water, that there is usually a period of from two to four weeks when there is a smaller run of water that may be used for irrigation, and this supply would be of immense value to the land and to the Indians who could increase the area under cultivation and also increase the yield of what they plant.

It is true that some kind of a crop could be raised here by dry farming, but the land needs additional water, and with two irrigations a year, which would be possible with this development, one before planting and the other after the July rains their crops will be assured.

Mr. Janus assures me that the Indians are anxious to farm here, and that there will be no lack of men ready to take hold as soon as they are assured that there will be a chance for them.

In company with Mr. Janus and Superintendent of Construction Post, two days were spent on the matter this month, one day spent in going over the ground thoroughly.

It is our opinion that the work done by Mr. Janus last year has permanently changed the stream, and that a small expenditure will make the dyke built at that time sufficient for the purpose designed, but in doing this, none of the flood waters will reach the cultivable lands and they will loose the benefit of at least two irrigations a year that is really necessary to make them produce.

Examinations show that by diverting the water from the stream, when it is not running heavy with silt, and bringing it to the land, is perfectly feasible, and that a diversion dam and a ditch about 800 feet long through a point of the mesa will be all that is necessary to do to bring the water wh where it can be distributed through small laterals.

Plans and estimates have been made and are submitted for your approval.

Accompanying this is a small plan of the structures, a profile of the ditch and a sketch of the location, not drawn to scale, but sufficiently accurate to indicate the situation.

Last year there was over 160 acres under cultivation. Three or four hundred acres may be brought under cultivation by the proposed work, and this will be a larger acreage than any place else on the reservation, and will, it is thought, equal in area all of the other cultivated areas.

There is sufficient fall that the water could be taken out in the ditch without any diversion structure, but from the lay of the country it is quire probable that unless some structure was placed there the bottom of the stream may be lowered, by erosion, or retrogression of grades, and while, from the situation it is thought that this could not exceed two feet, still, such a lowering of the point of diversion would make it impossible, or at least impracticable to divert the water without then building an expensive diversion dam.

At the proposed point of diversion the main channel is 46 feet wide, with a high water channel of about 75 feet.

A straight concrete wall 95 feet long is proposed. This wall would be 12" thick and reinforced. The spillway notch would be 75 feet long, with two wings each ten feet long. In front would be dumped a mass of rock and brush to prevent cutting. Through one of the wing walls would be an opening in which would be placed a small gate to control the entrance of water into the ditch. This ditch would be abdut 3 feet on the bottom, side slopes 1½ to 1, grade 0.1 per 100 feet, and the headgate would be 0.5 below the lip of the spillway.

The estimates submitted contemplates placing the diversion structure and excavating the canal through the hill, a distance of less than 800 feet, and a small amount for strengthening the dyke. The lateral system will be built by those who will cultivate the land and at no expense to this service.

Mr. Janus has offered his full cooperation, will donate the use of his teams for the work and he assures me that a considerable amount of donated labor, from the Indians who will have the use of the land, will be forthcoming.

The following estimate of cost has been made.

Excavation, Class I, 4170 cu yds @ 40¢	$1688.00
Concrete, 27 cu yds @ 30. per yd	810.00
Gate and placing,	100.00
Repairs to dyke,	150.00
Incidentals and superintendence,	500.00
	$ 3228.00

If we place the acreage under the project at 300 acres, although it is thought that the area will be at least 400 acres, the cost per acre for the construction of the project will be about $10.75 per acre. It is believed that the project would be justified at a cost double this.

There are sufficient funds in Auth. No. 57758, Miscellaneous Navajo, which would probably not be used unless this project is approved.

I therefore recommend its construction, which should be done this spring.

Very respectfully,

W. F. Robinson

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