(COPY)

Pelasco, Ariz.
October 31, 1932

Mr. C. A. Burns,
Acting Supervising Engineer,
Albuquerque, New Mexico.

Dear Mr. Burns:

This refers to your letter of October 19, 1932 relative to Office letter, Irrigation 45274-32 and 14637-30, directing survey be made of present water conditions at Cedar Springs and Indian Wells.

On October 27 we revisited Cedar Springs and measured the flow of present water supply. We found it to be approximately the same as was reported in our letter of September 8, which was 17.29 gallons per hour, or 415 gallons for a 24-hour flow.

In addition to this, small springs and seeps were visited but none was found of sufficient quantity to add much to the supply. The nearest one being 2½ miles distant with insufficient flow of 1½ gallons per minute to justify the expense of laying pipe line and pumping plant. This water supply is barely sufficient to take care of the Indian families and their stock in this immediate vicinity.

It appears that to obtain a water supply for an institution of approximately 30 people, it will be necessary to develop water by drilling a well to a depth of approximately 2500 feet, the cost of which will approximate $15,000. To this will have to be added pumping machinery consisting of an air compressor, piping, power plant, pump house, and storage reservoir at an approximate cost of $8,000, or a total cost of complete installation of $23,000. This is very discouraging, however, all shallow water possibilities have been thoroughly investigated in the immediate vicinity of Cedar Springs. No other feasible means of developing water, other than this well drilling, seems possible.

I realize that one of the main reasons for establishing a school at Cedar Springs is on account of the fact that the Department has a group of buildings that can be converted into a school plant and for this reason I have made a careful survey of every possibility of developing water at this place. There are other places a few miles distant (6-8 miles) where water of sufficient quantity could be developed at much less cost; however, this would involve the cost of new buildings.

I would like to state as a safeguard that even though we drill a deep well this service cannot guarantee quality of water; we are reasonably sure of the quantity. We will attach a generalized geologic log showing sedimentary deposits to be penetrated and this will be more or less self-explanatory. There are water stratas which we know will supply water unfit for domestic use and these it will be necessary to case out. There are at least two stratas underlying this

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which are reasonably sure of containing water of good quality. If this service has complete control of the drilling and development of this well it is reasonably sure that objectionable water can be cased out and the desired water developed.

Herewith find a generalized geologic log giving approximate thicknesses of the formations to be encountered which will show on the margin a brief description of formation and their characteristics.

On October 28th we visited Indian Wells in accordance with your instructions. We carefully checked over existing water supply and found them to be far short of what is needed for the few people already located there. Previous reports on the natural water sources show comparatively little change has taken place in regard to combined flow of springs. The combined flow as measured on the above date shows approximate flow, taking fluctuation into consideration, would not exceed 200 gallons every 24 hours. This cannot be considered when a plant of this size is planned for.

If it is intended to locate the proposed boarding school at Indian Wells, our investigation seems to prove that a deep well will be necessary, similar to the one proposed for Cedar Springs. However, on account of geologic conditions, the well at Indian Wells will not require as deep drilling as at Cedar Springs. The formation to be encountered will be the same as at Cedar Springs except that the lower half is what is locally known as the Mancos shale and Dakota sandstone.

The estimated depth of this well will be approximately 2100 feet, at an approximate cost of $12,600, to which must be added sufficient pumping machinery including power plant, pipe line, storage reservoir; this to be designed to conform to conditions after well is developed. It is impossible to specify and estimate cost of such machinery until developments are made and the requirements arrived at. It is reasonably safe to say that the most economic pumping scheme will be what is known as an air lift, involving air compressor, necessary pipe and fittings, the cost of which is estimated at approximately $8,000. To this should be added the cost of storage reservoir and distributing system.

Owing to the fact that the above-mentioned water development at the exact location of Indian Wells is extremely expensive, it may be that in view of this fact the Office would consider another location 7 miles south of Indian Wells where it may be possible to develop water by sinking the usual concrete caisson in this valley which is known as the Cottonwood Wash valley. While it is not absolutely safe to say that shallow water in sufficient quantities can be had at this location, without carrying on the drilling of some shallow test holes, it is believed that such tests could be made at a cost of from $1,000 to $3,000 and samples of water taken for analysis. In the event that the quality

and quantity of water was suitable, water at this point could be developed at a cost of $10,000 to $12,000, not including pipe line, reservoir, and pumping equipment. However, it would include the additional $1,000 to $3,000 for testing purposes, this expense being governed entirely by the number of test holes to be drilled.

Very truly yours,

(SGD) A. H. Womack

General Foreman

cc H. C. Neuffer
J. E. Balmer