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April 9, 1930.

Memorandum on the report of H.E. Williams dated July 31, 1929 on Western Navajo Reservation

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Under the heading "General Water Supply for the Reservation", page 7 of Mr. Williams' report, he gives some general description of the then developed water supply which is not very informative and follows with more general remarks about "indications of an underground water supply". Prof. Herbert E. Gregory, working in conjunction with the United States Geological Survey made extensive studies throughout the whole Navajo country and prepared "Water Supply Paper 380" which sets out his observations, conclusions and recommendations in connection with the possibilities and probabilities of there being a water supply in that locality and the proper steps to be taken in order to develop the available supply.

The irrigation forces have continued studies of the geology of the whole Navajo country and have for many years been drilling wells, developing springs and constructing surface tanks for the purpose of impounding storm waters where springs and wells do not and cannot exist. The following is quoted from Supervising Engineer Robinson's recent statement in connection with this matter:

> "The section east of Kayenta has been tested for underground water (see map). There are two wells there. Some ten miles east we found artesian flow at less than 300 feet. It is believed that the country as far east as Denehotso and north through Monument Valley this flow may be found.
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> "West of the Tuba country there is little chance to find water. The proximity of the Grand Canyon with its 5000-7000 foot gash, has largely bled the entire area lying between Echo Cliffs and itself.
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> "We have done a little drilling north and west of Tuba with indifferent results.
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> "There are a few springs in this country and we have been developing these as rapidly as possible. Have had a party in there for parts of several years on this work.
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> "Having decided we could only get the most meager results, we have begun to build reservoirs or charcos in this area and have a crew with a 40-HP tractor and a 27-cu-ft. rotary scraper at work. As the success of these depend upon the rainfall and the impervious nature of the basin, we can only report results after they have been in use for some time."

F.W. 1041

It will be noted that considerable has been done and much more is being done and still more is in prospect on this reservation. After prospecting on the western section of this reservation with well machines it was determined that drainage toward the Grand Canyon had so affected the ground water that failure to obtain satisfactory wells was frequent and a policy has been adopted of constructing surface tanks to intercept and store the runoff from the torrential storms that take place in that vicinity.

On the eastern part of this reservation, Prof. Gregory thinks that probably flowing wells may be obtained and this is now a part of the program.

Mr. Williams' statement that "there are indications of an underground water supply which, so far as I can learn, have never been tested" is so general that the particular sections of this vast area to which he has reference, cannot be located. The work is being carried on in an orderly manner and following the best scientific information available.

It is understood that Mr. Walker is engaged in some development work but where this is being done and what principles are being followed is unknown.

On page 11 Mr. Williams refers to the water development at Kayenta. Mr. Robinson has also furnished a statement in regard to this matter, and it follows:

"Kayenta is located about 175 miles from the nearest railroad point, hence in the construction of the dam, material was used that under normal conditions might not have been used. The dam was fairly well located. The so-called reservoir was not constructed as such. It was a natural lake bed. The water was turned in at the upper end and out at the lower end without much idea of a storage reservoir.

"John Wetherill never had anything to do with it.

"It was built by the irrigation forces many years ago and by authority of the Office it was turned over to the Agency to operate. Ditches were built to cover approximately 1,000 acres of land. These ditches were never utilized, 40 acres under cultivation being the maximum in any one year.

"The project has fallen into such a state that it will require to be entirely rebuilt before it can be used.

"I cannot give an idea of the cost of rehabilitating the project. The old lake bed has been filled with silt until it is valueless as a reservoir. If rebuilt and the reservoir eliminated it may be cheaper to rebuild the dam at another point and construct a new ditch for a portion of the distance.

"The costs of construction have been high because of it location. Records show total costs from its inception to date, including repairs at several times, have been $41,875.44."

This little project has had a history to some extent, parallel to the Red Lake Project, north of Ft. Defiance. After the work of construction was completed, its upkeep and management was turned over to the Superintendent of the reservation. He either lacked sympathy or ability and as a result a nice little project that might have been of quite considerable use to the Indians was soon partially wrecked and has been of no use to the Indians.

It does not seem advisable to reconstruct the project unless arrangements were made to have it properly handled. Perhaps the present Superintendent might make a success of it should it be put back in condition but to reconstruct and then allow it to go back again would be folly.

W. M. Reed