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RECONNAISSANCE GROUNDWATER SURVEY

NW 1/4, NE 1/4, Sec. 21, T11S R13W

Pima County, Arizona

Job #777

December 5, 1972

By

Terry Crump, Geologist

GBOEX Job # 777

At the request of Mr. Franklin Baza, 1776 South Palo Verde, Apartment B-105, Tucson, Arizona, 85713, a reconnaissance survey of the groundwater potential of the NW 1/4, NE 1/4, Section 21, T.11S., R.13W., Ruelas Canyon, Arizona 7.5 Minute Quadrangle, was conducted December 2, 1972. The area is located at the southern end of the Tortolita Mountains about 18 miles north of Tucson. The examination consisted of a cursory examination of several outcrops, streams, and seeps in the area by GEOEX geologist Terry R. Crump. Fracture attitudes were measured, and rock chip samples were taken from two locations. No subsurface information was gathered. Water was seen flowing in an intermittent stream, Canada Agua which trends generally NE-SW across the eastern portion of the property.

Bedrock is exposed over approximately fifty percent of the area, and the alluvium cover over the remainder of the area is probably two to five feet thick in small depressions between outcrops. The rock exposed in outcrop is a moderately to intensely fractured, medium-grained, biotite granite. Two fracture directions are prominent throughout the area; one set, N55°E, 70°SE to vertical, controls the main channel of Canada Agua on the property. The other, crosscutting set, N40°E to E-W, 25°-40°S is expressed as a series of close-spaced fractures and shears on which slickensides generally plunge 75° to 90° south. Small water seeps are exposed along this set at several

locations on the property.

The area of this examination is probably separated from the nearest producing water well to the south by a normal fault. The significance of this fault is that the development of a suitable alluvium cover, which permitted the development of a water supply, has occurred on the south or downthrown side of the fault. On the north or upthrown side, a suitable alluvium cover has not developed; hence, the chances for development of a ground water supply are remote.

How far?

A factor which contributes to the risk associated with development of a suitable water supply with a source south of this area is that although existing intermittent streams are recharge points for the ground water system, primary ground water channels are probably old, buried stream channels. The realtor reported that a well being drilled in the SE 1/4, NE 1/4, Section 21, was dry at 650 feet; this is probably due to failure to intersect a suspected ground water channel, of the type described.

CONCLUSIONS:

1. Streams and seeps in the area are intermittent and are apparently controlled by fracture sets.
2. Existing streams and seeps are not sufficient to allow development of a water system based wholly on

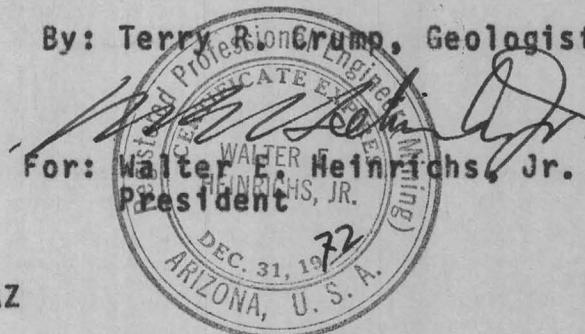
these sources. However, these sources could be utilized to supplement a marginal groundwater supply if a system of capped cisterns were established.

3. The alluvium cover in the area is insufficient to allow the development of a groundwater supply at a reasonable cost; this probably includes such a supply augmented by a cistern supply.
4. A suitable water supply could probably be developed in the area, but the cost would probably be in excess of \$15,000. Such a supply would require drilling of a subsurface cistern(s) in or near Canada Agua to provide catchments of sufficient volume to provide water through dry periods. Additionally, smaller cisterns established on several seeps in the area would be required to supplement the primary source.

Alternatively, water rights might be procured on a property south of the area such that a well could be drilled and a water supply established using the well as a source and a pump and pipe system to deliver the water to a reservoir on the property. But again, such a system could be developed only at considerable cost.

By: Terry R. Grump, Geologist

For: Walter E. Heinrichs, Jr.
President



Grump Job #777

DEC 5 1972

TRC:oeK

P.O. Box 5964 Tucson, AZ

December 5, 1972

Mr. Franklin Baza
1776 South Palo Verde
Apartment B-105
Tucson, Arizona 85713

Re: GEOEX Job #777

Dear Robin:

Enclosed are three copies of the report concerning the reconnaissance survey of the groundwater potential of the NW 1/4, NE 1/4, Section 21 T11S, R13E, Ruelas Canyon, Arizona, 7.5 Minute Quadrangle.

Based on the reconnaissance, the possibility for development of a reliable groundwater supply at a reasonable cost appears remote. Consequently, neither further work in the area nor consideration of the area as a possible home site seem advisable.

Sincerely,

Heinrichs GEOEXploration Co.

Terry R. Crump
Geologist

TRC:oeK

Enclosure