

**United States
Department of the Interior
Geological Survey**

**Ground-water conditions between Oracle and Oracle Junction,
Pinal County, Arizona**

By

L. A. Heindl

A supplement to

**Memorandum on geology and ground-water resources in the
vicinity of Oracle, Pinal County, Arizona**

**Prepared in cooperation with
Arizona State Land Department
Roger Ernst, Commissioner**

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**GROUND-WATER CONDITIONS BETWEEN ORACLE AND
ORACLE JUNCTION, PINAL COUNTY, ARIZONA**

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The development of the San Manuel copper prospect has greatly increased traffic along State Highway 77. Considerable interest in commercial possibilities along that road has resulted in a request by the Arizona State Land Department for information about the ground-water conditions between Oracle and Oracle Junction. This request came too late for information to be included in a recently completed memorandum report on the occurrence of ground water in the vicinity of Oracle, released in February 1955. These data are presented as a supplement to that report to minimize duplication of statements about the general geologic and hydrologic conditions. The necessary well data and sample descriptions that were not included in the Oracle report are shown in tables 3 and 4.

The area discussed in this supplement comprises parts of Tps. 9 and 10 S., Rs. 13, 14, and 15 E., and includes about 90 square miles (fig. 3). The eastern portion overlaps part of the area covered by the earlier report.

The area along State Highway 77 between Oracle and Oracle Junction lies on the gentle northwest slope of the Santa Catalina Mountains. The altitude at Oracle is about 4,500 feet and at Oracle Junction it is about 3,300 feet. The area is drained by Big Wash and Canada del Oro, which are tributary to the Santa Cruz River. West of Big Wash the land rises towards the Tortolita Mountains, west of the mapped area. Precipitation along the highway probably decreases with altitude from Oracle to Oracle Junction, but specific data for Oracle Junction are not available. At Oracle the average annual precipitation is about 19 inches.

The area is underlain by rocks of the main mass of the Santa Catalina Mountains and by alluvial fill derived from these mountains and from the Tortolita Mountains to the west. The Tortolita Mountains are composed mostly of granitic and metamorphic rocks similar to those in the Santa Catalina Mountains. The geology of the Santa Catalina Mountains and the water-bearing characteristics of the alluvial fill and granite are described in the previously mentioned report on the Oracle area.

Ground water in the area moves downslope from the Santa Catalina and Tortolita Mountains. Water levels in wells in the granitic rocks range from about 50 to about 175 feet below the land surface, and in the alluvial fill, from about 80 to about 700 feet. Depths to water in wells in the vicinity of Oracle Junction range from about 300 to about 430 feet.

No discharge data are available for wells in the Oracle Junction area, but the pump capacities are known to be sufficient only for stock and domestic purposes. These wells are drilled in alluvium and have not been tested for maximum sustained yield.

The ground water in the alluvial fill in the Oracle Junction area contains moderate amounts of dissolved solids, about 225 parts per million, and the fluoride content is within the limit (1.5 ppm) set by the U. S. Public Health Service. In water from the granitic rocks, the content of dissolved solids ranges up to about 500 parts per million (table 2), and locally the fluoride content exceeds the maximum in the Public Health Service standard.

Ground-water conditions along State Highway 77 between Oracle and Oracle Junction are summarized below:

1. Ground water along this stretch of highway is developed in limited quantities from suitably located wells in granitic rocks and alluvium.
2. Small quantities of ground water may be developed almost anywhere from the granitic rocks.
3. Moderate quantities of water may be available in the alluvial fill but yields must be proved by adequate testing.
4. The quality of the ground water in the area is satisfactory for domestic and municipal use according to U. S. Public Health Service

standards except locally where the fluoride content of water from the granitic rocks is in excess of 1.5 parts per million.

Table 3.—Records of wells in the Oracle Junction area, Pinal County, Ariz.

Well number	Depth (feet)	Type a/	Water level		Type of lift c/	Yield (gpm) d/	Use e/	Analyses f/	Remarks
			Depth (feet)	Date b/					
<u>(D-9-15)</u> 36aba	225	Dr	73.5	8/49 M	C,E	8 R	P	X	In granitic rocks.
<u>(D-10-13)</u> 12bbc	495	Dr	401.0	12/54 M	C,E	-	S	-	In alluvium.
<u>(D-10-14)</u> 6cbb	470	Dr	436.9	12/54 M	C,E	-	D,S	X	In alluvium.
8ccd	550	Dr	438.5	12/54 M	C,E	-	S	-	In alluvium.
19aca	460	Dr	327.8	12/54 M	C,G	-	D	X	In alluvium. Water level reported to be 250' in Nov. 1941.

a/ Dr, drilled.

b/ M, measured.

c/ C, cylinder; E, electric; G, gasoline.

d/ R, reported.

e/ D, domestic; P, public supply; S, stock.

f/ See table 4 for analyses.

Table 4.—Analyses of water from representative wells in the Oracle Junction area, Pinal County, Ariz.
(Chemical constituents in parts per million)

Well no.	Date of collection	Depth of well (feet)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium and potassium (Na+K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	Percent sodium	Specific conductance (micromhos at 25°C)
<u>(D-9-15)</u> 36aba	8-8-49	224	15	55	19	51	322	13	30	2.0	0.3	mg	200	-	765
<u>(D-10-14)</u> 6cbd	10-21-52	470	30	44	5.7	25	202	8.8	6	0.2	5.1	-	134	29	348
19aca	10-23-52	460	35	52	6.9	6.9	185	3.3	6	0.2	11	-	158	9	328

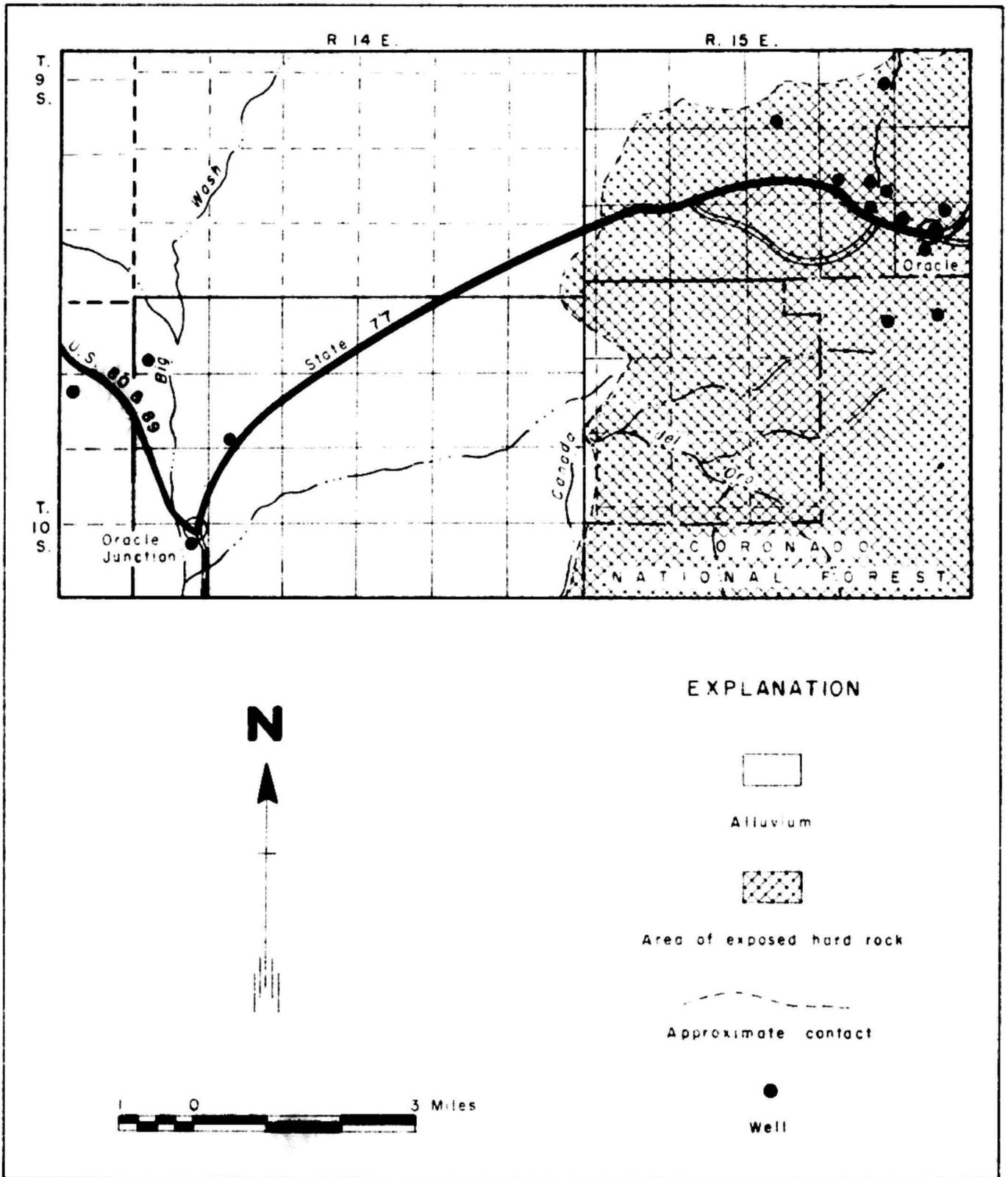


Figure 3.-- Reconnaissance map of area between Oracle and Oracle Junction, Pinal County, Ariz., showing contact between alluvium and bedrock, and location of wells.