

WATER - RESOURCES REPORT NUMBER THIRTY - THREE
ARIZONA STATE LAND DEPARTMENT
OBED M. LASSEN, COMMISSIONER

WACA



BASIC GROUND-WATER DATA
FOR SOUTHERN COCONINO COUNTY
ARIZONA

BY E. H. McGAVOCK



PREPARED BY THE GEOLOGICAL
SURVEY, UNITED STATES DEPARTMENT
OF THE INTERIOR

PHOENIX, ARIZONA
MARCH 1968

ARIZONA STATE LAND DEPARTMENT WATER-RESOURCES REPORTS

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| <p>No.</p> <ul style="list-style-type: none"> * 1. Pumpage and ground-water levels in Arizona in 1955, by P. W. Johnson, N. D. White, and J. M. Cahill: 69 p., 30 figs., 1956. * 2. Annual report on ground water in Arizona, spring 1956 to spring 1957, by J. W. Harshbarger and others: 42 p., 18 figs., 1957. * 3. Geology and ground-water resources of the Harquahala Plains area, Maricopa and Yuma Counties, Arizona, by D. G. Metzger: 40 p., 2 pls., 7 figs., 1957. * 4. Geology and ground-water resources of the Palomas Plain-Dendora Valley area, Maricopa and Yuma Counties, Arizona, by C. A. Armstrong and C. B. Yost, Jr.: 49 p., 3 pls., 4 figs., 1958. * 5. Annual report on ground water in Arizona, spring 1957 to spring 1958, by W. F. Hardt, J. M. Cahill, and M. B. Booher: 60 p., 19 figs., 1958. * 6. Annual report on ground water in Arizona, spring 1958 to spring 1959, by W. F. Hardt, R. S. Stulik, and M. B. Booher: 61 p., 18 figs., 1959. * 7. Annual report on ground water in Arizona, spring 1959 to spring 1960, by W. F. Hardt, R. S. Stulik, and M. B. Booher: 89 p., 22 figs., 1960. * 8. Geology and ground-water resources of the McMullen Valley, Maricopa, Yavapai, and Yuma Counties, Arizona, by William Kam: 72 p., 17 figs., 1961. 9. Hydrologic data and drillers' logs, Papago Indian Reservation, Arizona, by L. A. Heindl and O. J. Cosner, with a section on chemical quality of the water by L. R. Kister: 116 p., 3 figs., 1961. *10. Annual report on ground water in Arizona, spring 1960 to spring 1961, by N. D. White, R. S. Stulik, E. K. Morse, and others: 93 p., 32 figs., 1961. *11. Annual report on ground water in Arizona, spring 1961 to spring 1962, by N. D. White, R. S. Stulik, and others: 116 p., 35 figs., 1962. | <p>No.</p> <ul style="list-style-type: none"> *12A. Geohydrologic data in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Part I, Records of ground-water supplies, by G. E. Davis, W. F. Hardt, L. K. Thompson, and M. E. Cooley: 159 p., 3 figs., 1963. *12B. Geohydrologic data in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Part II, Selected chemical analyses of the ground water, by L. R. Kister and J. L. Hatchett: 58 p., 2 figs., 1963. 12C. Geohydrologic data in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Part III, Selected lithologic logs, drillers' logs, and stratigraphic sections, by M. E. Cooley, J. P. Akers, and P. R. Stevens: 157 p., 3 figs., 1964. 12D. Geohydrologic data in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Part IV, Maps showing locations of wells, springs, and stratigraphic sections, by M. E. Cooley and others: 2 sheets, 1966. 12E. Geohydrologic data in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Part I-A, Supplemental records of ground-water supplies, by E. H. McGavock, R. J. Edmonds, E. L. Gillespie, and P. C. Halpenny: 55 p., 4 figs., 1966. 13. Desert floods—a report on southern Arizona floods of September 1962, by D. D. Lewis: 13 p., 18 figs., 1963. *14. Basic ground-water data of the Willcox basin, Graham and Cochise Counties, Arizona, by S. G. Brown, H. H. Schumann, L. R. Kister, and P. W. Johnson: 93 p., 15 figs., 1963. *15. Annual report on ground water in Arizona, spring 1962 to spring 1963, by N. D. White, R. S. Stulik, E. K. Morse, and others: 136 p., 47 figs., 1963. 16. Effects of ground-water withdrawal in part of central Arizona projected to 1969, by N. D. White, R. S. Stulik, and C. L. Rauh: 25 p., 7 figs., 1964. |
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BASIC GROUND-WATER DATA FOR SOUTHERN COCONINO COUNTY, ARIZONA

By E. H. McGavock

Introduction

In July 1964 the U. S. Geological Survey in cooperation with the Arizona State Land Department, O. M. Lassen, Commissioner, began an investigation of the water resources of southern Coconino County. The purpose of this report is to make available basic ground-water data that are useful in planning and studying water-resources development in the area and to supplement the interpretive report, which will be published later.

The tabulated and illustrated data include information on springs and on wells drilled from 1900 to 1967. Most of the well data, logs, well discharges, and reported drawdowns were obtained from the records of well owners and drillers. Water levels in most of the wells were measured by personnel of the U. S. Geological Survey.

Southern Coconino County encompasses about 10,600 square miles, most of the land is used for grazing. The area is bounded on the east, south, and west by the county line and on the north by the Colorado and Little Colorado Rivers (fig. 1). The principal centers of population are Flagstaff, Sedona, and Williams. The city of Winslow in Navajo County also obtains its water supply from wells in Coconino County.

The well and spring records are arranged in numerical order by township, range, and section

under the well-numbering system used in Arizona in accordance with the Bureau of Land Management's system of land subdivision (fig. 2).

Acknowledgments and Personnel

The author appreciates the cooperation of the well owners and drillers who contributed information for this report. Messrs. H. F. Dunnam of the city of Flagstaff, R. B. Stinson of the city of Winslow, and M. B. McCutchan of the Arizona Water Co., provided valuable information on municipal wells in the area. Special thanks are due Mr. W. J. Breed, Museum of Northern Arizona, and Mr. J. R. Scurlock, State of Arizona Oil and Gas Conservation Commission, for permitting access to their records.

This investigation was conducted under the immediate supervision of H. M. Babcock, district chief of the Water Resources Division in Arizona. Substantial contributions, including the basic data collection, were made by personnel of the Arizona district. Those deserving special mention are E. L. Gillespie, J. W. H. Blee, and L. J. Mann.

Explanation of Illustrations and Tables

Included in this report are tables of well records, spring records, drillers' logs, and chemical analyses of ground water. The main illustration shows the location of wells and springs and the altitude of the water level as of June 1967.

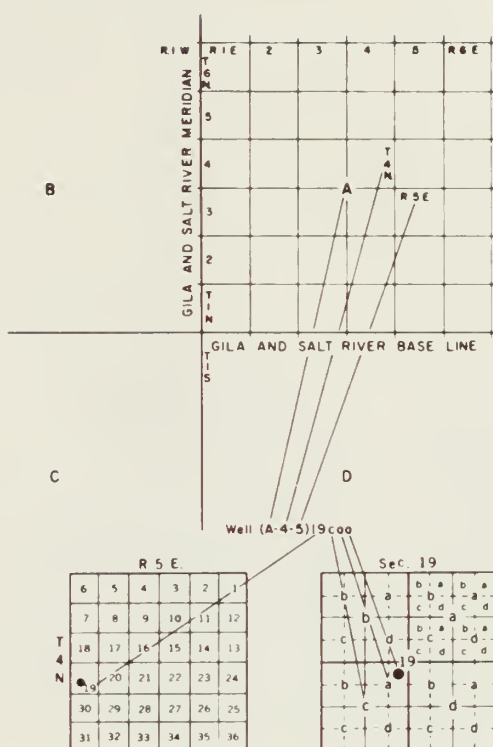


Figure 1.--Area of report.

Illustrations. -- Figure 3 shows the stratigraphic names and generalized distribution of the rocks and sediments in southern Coconino County. Rocks of Triassic age and younger occur in the entire area, but some rocks of Permian age and older are present only in the northwest part of the area. Figure 3, therefore, is divided into northwest and southeast sections where applicable.

Figure 4 shows the locations of selected wells and springs listed in tables 1 and 2; the wells and

springs for which chemical analyses are included in table 4; and the altitude of the water level, in feet above mean sea level, in the Coconino Sandstone and Supai Formation in the eastern half of the area. The contour lines shown on the map connect points of equal altitude of the water level and depict the shape of the water-table surface. Figure 4 also shows the altitude of all springs listed in table 2, the altitude of the water level in isolated wells, and the altitude of the bottom of dry holes in the western half of the area.



The well numbers used by the Geological Survey in Arizona are in accordance with the Bureau of Land Management's system of land subdivision. The land survey in Arizona is based on the Gila and Salt River meridian and base line, which divide the State into four quadrants. These quadrants are designated counterclockwise by the capital letters A, B, C, and D. All land north and east of the point of origin is in A quadrant, that north and west in B quadrant, that south and west in C quadrant, and that south and east in D quadrant. The first digit of a well number indicates the township, the second the range, and the third the section in which the well is situated. The lowercase letters a, b, c, and d after the section number indicate the well location within the section. The first letter denotes a particular 160-acre tract, the second the 40-acre tract, and the third the 10-acre tract. These letters also are assigned in a counterclockwise direction, beginning in the northeast quarter. If the location is known within the 10-acre tract, three lowercase letters are shown in the well number. In the example shown, well number (A-4-5)19caa designates the well as being in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 19, T. 4 N., R. 5 E. Where there is more than one well within a 10-acre tract, consecutive numbers beginning with 1 are added as suffixes.

Figure 2. -- Well-numbering system in Arizona.

SYSTEM	STRATIGRAPHIC UNIT
QUATERNARY	Alluvium Volcanic rocks
TERTIARY	Volcanic rocks and silt, sand, and gravel
CRETACEOUS	Sandstone; present in southeastern corner of the county
TRIASSIC	Chinle Formation Petrified Forest Member Shinarump Member Moenkopi Formation
PERMIAN	Kaibab Limestone Toroweap Formation; present north and west of Verde Valley Coconino Sandstone Hermit Shale; present in the Grand Canyon area
PERMIAN AND PENNSYLVANIAN	Supai Formation
PENNSYLVANIAN	Naco Formation; present in southeastern part of area east of Verde Valley Limestone unit; present in area of Hualapai Indian Reservation
MISSISSIPPIAN	Redwall Limestone
DEVONIAN	Martin Limestone; present east and south of Hualapai Indian Reservation Temple Butte Limestone; present in eastern Grand Canyon Limestone unit; present near Hualapai Indian Reservation
CAMBRIAN	Muav Limestone; present north of Verde Valley Bright Angel Shale; present north of Verde Valley Tapeats Sandstone
PRECAMBRIAN	Mainly granite, gneiss, and schist

Figure 3. --Stratigraphic units in southern Coconino County.

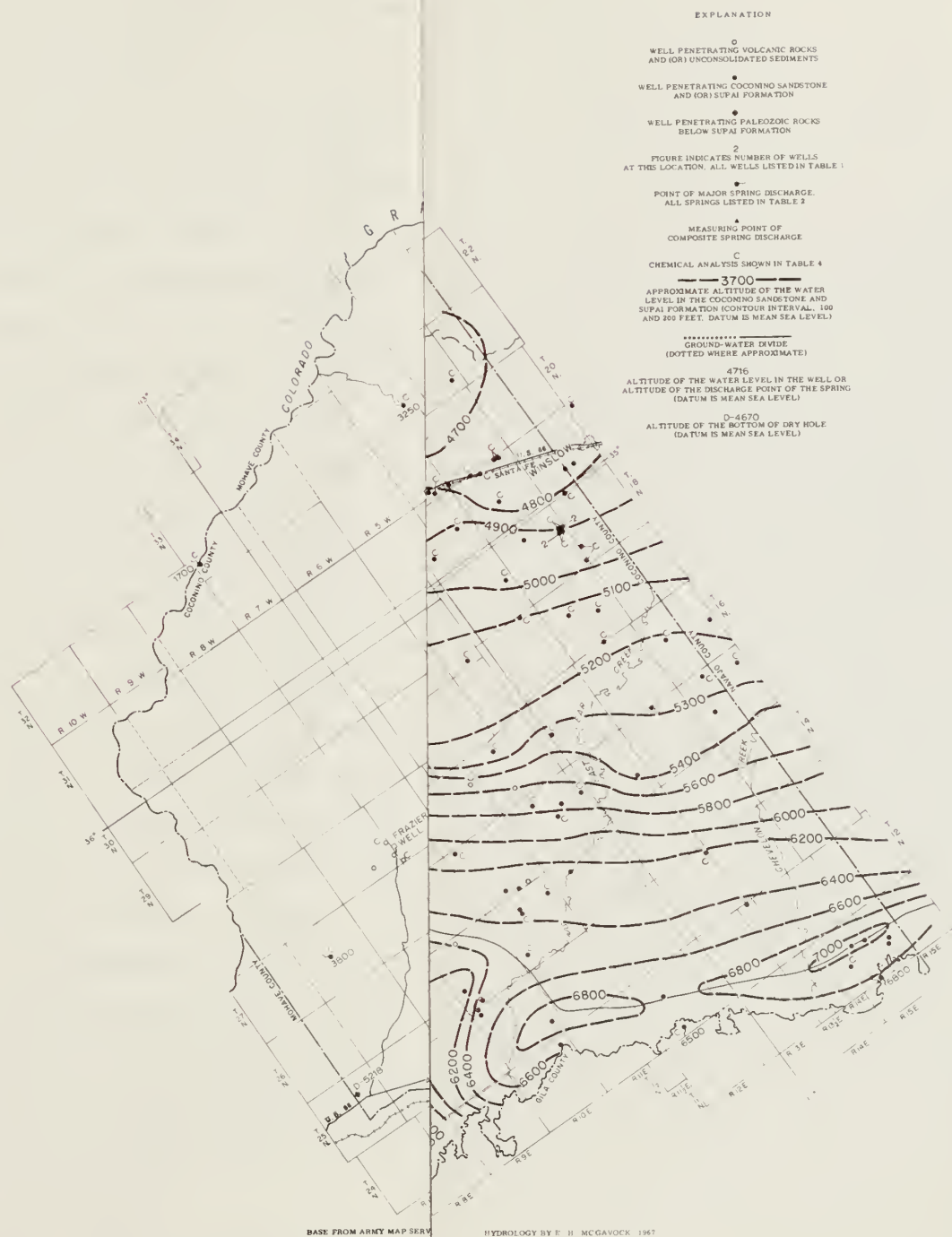


FIGURE STONE AND SUPAI

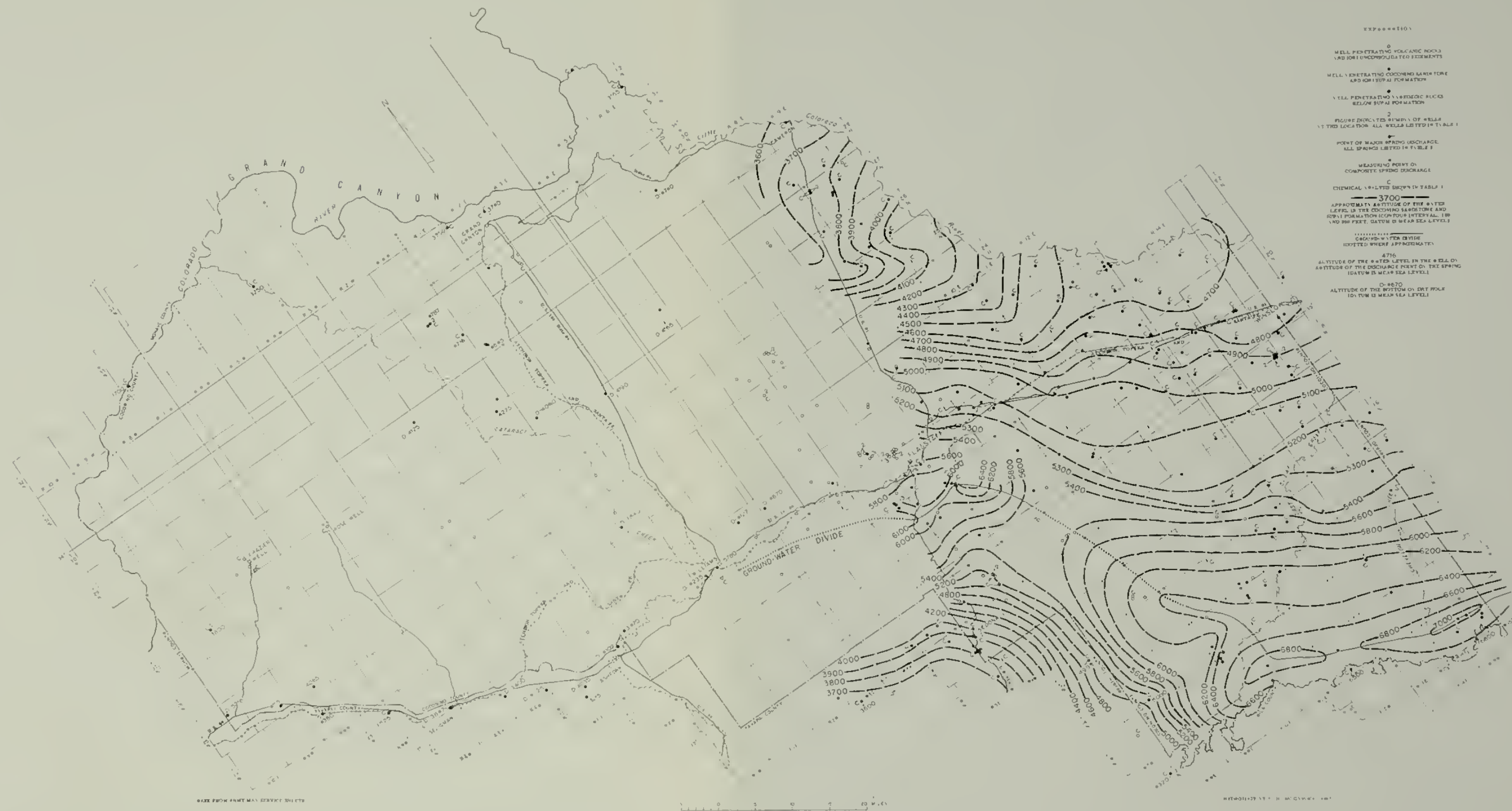


FIGURE 4.--LOCATION OF SELECTED WELLS AND SPRINGS AND ALTITUDE OF THE WATER LEVEL IN THE COCONINO SANDSTONE AND SUPAI FORMATION, JUNE 1967, SOUTHERN COCONINO COUNTY.

Table 1. -- The well records in this table are for selected wells in the area and for some wells in adjacent counties. Table 1 is cross-referenced with tables 3 and 4, and the locations of the wells listed in table 1 are shown in figure 4.

Table 1 includes the well-location number, the reported depth of the well, and the diameter of the casing. Land-surface altitudes were determined from the best available topographic maps or with an aneroid altimeter. The principal stratigraphic units that yield water to the well are listed under the heading "Water-bearing strata." The static water level is the water level below land surface when the well is not being pumped. Most of the bail or pump-test data were reported by well drillers or owners. When only the pumping rate is shown, the figure refers to the pumping rate during normal operation; otherwise, the figure is the rate of discharge during a bail or pump test. The drawdown is the amount of lowering of the water level caused by pumping the well at a given rate. The duration of the test is the time necessary to produce the drawdown at the given rate. The primary use for which the water is withdrawn is shown in the column "Use of water." The availability of supplementary information in tables 3 and 4 is indicated by appropriate symbols in the columns headed "Well log" and "Chemical analysis." The remarks column contains supplementary data, such as the name of the well, reported well deepening, and other information.

Table 2. -- The spring records included in this table are for selected springs in and near the report area. The locations of springs listed in table 2

are shown in figure 4. The geologic formations listed under the heading "Source rock" refer to the formations from which the springs actually discharge, and these formations may not be the principal reservoir rock. The range of measurements is the range of discharge measurements or estimates made at the spring. The symbol T4 under the heading "Chemical analysis" indicates that a chemical analysis of the water from the spring is included in table 4. The names of the springs and other data are shown in the remarks column.

Table 3. -- Table 3 contains selected drillers' logs that are considered to be representative or that have special geologic or hydrologic significance. The drillers' rock descriptions have been retained, and the stratigraphic correlations have been added by the author. By comparing the driller's rock description with known thicknesses and descriptions of the rocks on the surface, most of the stratigraphic units can be recognized. Stratigraphic correlations are listed as undifferentiated in many logs where minor differences in the rock units are not reflected in the driller's description. The locations of wells listed in table 3 are shown in figure 4.

Table 4. -- Table 4 contains laboratory analyses of the water from selected wells and springs. The locations of wells and springs listed in table 4 are shown in figure 4.

The Director of the U.S. Geological Survey has approved the change in reporting of Survey water-quality data from the English system to metric system. Therefore, the water-quality data in this report

are given in milligrams per liter (mg/l), degrees Celsius (°C), and micromhos at 25°C. The terms "parts per million" and "milligrams per liter" are practically synonymous for water containing as much as 5,000 to 10,000 mg/l of dissolved solids. The exact amount is dependent on the nature of the dissolved material. The Survey has set 7,000 mg/l dissolved solids as the point above which the differ-

ence in parts per million and milligrams per liter becomes significant. In order to convert data from one system to the other, a density factor must be applied to the analytical results of all water containing more than 7,000 mg/l of dissolved solids.

Temperature data given in tables 1 and 4 can be converted to degrees Fahrenheit (°F) by using the chart shown below.

°F	°C	°F	°C	°F	°C	°F	°C
32	0	55	13	78	26	101	38
33	1	56	13	79	26	102	39
34	1	57	14	80	27	103	39
35	2	58	14	81	27	104	40
36	2	59	15	82	28	105	41
37	3	60	16	83	28	106	41
38	3	61	16	84	29	107	42
39	4	62	17	85	29	108	42
40	4	63	17	86	30	109	43
41	5	64	18	87	31	110	43
42	6	65	18	88	31	111	44
43	6	66	19	89	32	112	44
44	7	67	19	90	32	113	45
45	7	68	20	91	33	114	46
46	8	69	21	92	33	115	46
47	8	70	21	93	34	116	47
48	9	71	22	94	34	117	47
49	9	72	22	95	35	118	48
50	10	73	23	96	36	119	48
51	11	74	23	97	36	120	49
52	11	75	24	98	37	121	49
53	12	76	24	99	37	122	50
54	12	77	25	100	38		

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TABLES

Table 1. --Records of selected wells in southern Coconino County

Location: See p. 3 for description of well-numbering and location system.
Static water level: R, reported.
Bail or pump-test data: R, reported.
Use of water: D, domestic; Ind, industrial; Irr, irrigation; N, none; PS, public supply; S, stock.

Well log: T 3, log included in table 3.
Chemical analysis: T 4, chemical analysis included in table 4.
Remarks: ATT, American Telephone and Telegraph Co.; EPNG, El Paso Natural Gas Co.; P.M., Bureau of Indian Affairs, Branch of Plant Management; T.P., trading post.

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-11-14)13aca	.....	650	.....	7,555	Coconino Sandstone	403	6-14-66	.....	.....	.....	D	.....	.....	.....
14bab	1956	695	.....	7,500	 do	435 R	8- -59	.....	.....	.....	D, Ind	.....	.....	Manganese Mine well.
22cbd	7-66	915	6	7,575	Coconino Sandstone and Supai(?) Formation.	680	8-9-66	17	54	3½	PS	.....	T 4	Canyon Point well.
(A-11-15)19dda	.....	.....	.....	7,460	Coconino Sandstone	598	6-14-66	.....	.....	.....	D	.....	.....	.....
20bdc	.....	.....	.....	7,550	 do	697	6-14-66	.....	.....	.....	D	.....	.....	.....
(A-12-10)1cab	1-64	743	.....	7,346	Supai(?) Formation	731 R	1-4-64	.....	.....	.....	N	.....	.....	Phelps-Dodge No. 20.
(A-12-12)16acb	12-64	963	5	7,425	Coconino Sandstone and Supai(?) Formation.	649	12-16-64	9	126	1	PS	.....	.....	Knoll Lake well; temperature 11°C.
(A-12-13)1bbd	7-64	812	6	7,160	Coconino Sandstone	750 R	7-22-64	.....	.....	.....	D	T 3	.....	Dye Ranch well.
(A-13-7)14bab	1963	800	6	5,955	Volcanic rocks, sand, and gravel.	752	9-22-66	.....	.....	.....	S	T 3	T 4	Mud Tanks well.
(A-13-10)8ada	8-64	627	.....	6,865	Coconino Sandstone	488	7-13-66	.....	.....	.....	.....	.....	.....	Fuller No. 2 well.
6daa	8-64	567	.....	6,865	 do	347	7-13-66	395 R	31 R	72	N	.....	.....	Fuller No. 1 well.
25caa	10-63	726	.....	7,334	 do	427 R	6-10-64	.....	.....	.....	N	T 3	.....	Phelps-Dodge No. 14.
(A-13-13)1ddb	5-52	905	8	7,010	 do	764	6-13-66	16.5	.....	4½	D	.....	T 4	Chevelon Ranger Station well.
(A-14-10)4ac	.....	14	48	6,740	Alluvium	7.6	7-20-66	.....	.....	.....	S	.....	.....	Dug well.
30aca	1954	1,050	.....	6,900	Coconino Sandstone	867	7-13-66	.....	.....	.....	Ind(?)	.....	.....	Do.
32db	.....	23	.....	6,850	Alluvium	15 R	1946	.....	.....	.....	N	.....	.....	.....
32abd	6-63	600	17	6,855	Coconino Sandstone	344	6-9-66	525 R	20 R	24 R	D	.....	.....	.....
(A-14-11)9adc	11-66	670	8	6,905	 do	532	11-22-66	43	21	8½	PS	T 3	.....	Blue Ridge Maintenance Camp well; temperature 13°C.
9dca	9-58	665	8	6,885	 do	495	11-22-66	48	20	1½	PS	T 3	T 4	Timber Ranger Station well.
12bcd	7-34	477	6	6,730	 do	358	7-21-66	.....	.....	.....	D, S	T 3	T 4	Moqui Ranch well.
30ddd	10-65	1,000	5	7,323	 do	841	10-21-65	11	5	16	PS	.....	T 4	Rock Crossing well.
(A-14-12)8add	5-66	301	4	6,270	 do	12	6-8-66	.....	.....	.....	N	.....	.....	Macks Crossing observation well.
(A-15-11)5bdc	.....	800	8	6,710	 do	640	6-22-66	.....	.....	.....	D, S	.....	T 4	Haylake Ranch well.
33adb	.....	550	10	6,740	 do	430	9-20-66	.....	.....	.....	D	.....	.....	.....
34dcd	1964	600	6	6,825	 do	461	9-20-66	.....	.....	.....	PS	.....	.....	.....
35dad	.....	40	6	6,725	Alluvium	Dry	9-20-66	.....	.....	.....	N	.....	.....	Fisher well.
(A-15-12)4ccc	11-47	778	8	6,410	Coconino Sandstone	628	12-2-66	.....	.....	.....	D, S	.....	T 4	South Quail well.

Table 1.--Records of selected wells in southern Coconino County--Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-15-12)14bba	1957(?)	875	6	6,480	Coconino Sandstone	800 R	5-11-66				D, S	.....	.....	
15ddc		780	8	6,520	do	678	5-5-66				S	.....	.....	AZ Ranch well.
(A-15-13)18cba		800		6,360	do	718	5-5-66				S	.....	.....	Red Hill well.
25bbb		1,120	10	6,450	do	1,077	5-5-66				S	.....	.....	Tillman-Ellsworth well.
(A-15-14)3bbb	6-50	825	8	6,010	do	732	11-22-66				S	.....	.....	T4
(A-15-15)4bdc		850	8	5,950	do	694	11-22-66				S	.....	.....	T4
12bbc			8	5,900	do	718	12-2-66				S	.....	.....	T4
20cbc			8	6,160	do	815	11-22-66				D, S	.....	.....	
(A-16-5)24acc	1963	460	8	4,000	Supai Formation	274	1-16-67	30 R	50 R	2	PS	.....	.....	T4
(A-16-6)8ccd		625	8	4,255	do	446	1-16-67	20 R	115 R		PS	.....	.....	T4
(A-16-9)28cba	1944(?)	125	8	7,495	Volcanic rocks	42	9-22-66				PS	.....	.....	
28cbc	7-61	97	8	7,495	Volcanic rocks and silt	39	9-22-66	25 R	3 R	1½	PS	T3		Happy Jack well; plugged back from 135 feet.
34cab	1966	215		7,255	Volcanic rocks	Dry R	1966				N	.....	.....	
(A-16-11)13bca		12	72	6,575	Alluvium	8.0	11-22-66				N	.....	.....	T4
(A-16-12)9bbb	1930	1,000	8.5	6,210	Coconino Sandstone	946 R	1949				S	.....	.....	T4
29add	11-33	36	6	6,180	Kaibab Limestone	Dry	11-2-66				N	.....	.....	
(A-16-13)19aaa	1930	977	8	6,100	Coconino Sandstone	775	7-22-66				S	.....	.....	T4
(A-16-14)3bba		800	8	5,660	do	506	5-5-66				S	.....	.....	T4
(A-16-15)17abc		580	6	5,665	do	433	7-29-66				S	.....	.....	T4
24ab	6-64	705	8	5,625	do	505 R	6-26-64				S	.....	.....	
(A-17-5)3dbd	1951	816	6	4,620	Supai Formation	746 R	7- -66	11 R			PS	.....	.....	Navajo County Highway well.
25aab	1955	750	8	4,430	do	595	1-13-67	22 R	23 R		PS	.....	.....	Redcliff well.
(A-17-6)8bdb	1960	560	7	4,230	do	181	1-13-67				PS	.....	.....	Sky Mountain well.
18aba		257	6	4,220	do						D	.....	.....	Sedona No. 3 well.
18add1	1960	500	6	4,240	do	281 R	1960				PS	.....	.....	Original depth 177 feet.
18add2	12-63	350	6	4,240	do						D	T3		Sedona No. 2 well.
19bbc			5	4,195	do	298	1-13-67					.....	.....	
30abc			10	4,335	do	483	1-13-67				N	.....	.....	Doodlebug No. 1 well.
30bba			6	4,295	do	440	1-13-67				N	.....	.....	Chapel Hill Estates No. 2 well.
														Chapel Hill Estates No. 1 well.

Table 1. --Records of selected wells in southern Coconino County-- Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Ball or pump-test data		Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)				
(A-17-6)30bc	1951	.....	8	4,250	Supai Formation	454	4-19-62	.....	.....	D	.....	T4	Plugged back from 256 feet.
(A-17-7)4ddc	.....	130	6	6,315	Alluvium	72 R	8- -61	1.5R	.....	S	T3	.....	
(A-17-12)5cb	.....	960	8	6,050	Coconino Sandstone	930 R	4-24-66	10 R	.....	S	.....	.....	
(A-17-13)2baa	.....	600	8	5,565	 do	461	5-5-66	.....	.....	S	.....	T4	
(A-17-14)17add	1946	600	8	5,550	 do	407	11-6-64	.....	.....	S	.....	T4	
23bcd	.....	475	8	5,535	 do	404	5-5-66	.....	.....	S	.....	T4	
(A-18-2)25bca	6-66	726	6	4,295	Supai Formation	630 R	7-21-66	17	30	S	.....	.....	
(A-18-4)25bcb	1950	1,120	8	4,755	Redwall Limestone and Supai(?) Formation.	760 R	6-2-67	10 R	.....	D, S	.....	T4	Red Canyon Ranch well.
(A-18-5)27abb	1949	1,200	8	4,700	 do	708	6-2-67	9 R	.....	PS	.....	T4	
29adc	3-64	852	6	4,570	Supai Formation	676	5-31-67	9	.....	N	T3	.....	
(A-18-6)21bba	1958	90	8	4,790	Alluvium(?)	15 R	1958	.....	.....	PS	.....	.....	Manzanita well.
21dc	11-66	266	8	4,740	Supai Formation	46 R	1-11-67	.....	.....	PS	.....	.....	Encinosa well.
(A-18-7)15ccb1	.....	184	20	6,440	Alluvium	100 112	7-22-65 1-11-67	.....	.....	N	.....	.....	Northern No. 3 well.
15ccb2	.....	205	14	6,438	 do	98	7-22-65	450	.....	lrr	T3	T4	Oakwood Irrigation Supply well.
15ccc	1958	200	10	6,435	 do	118	1-11-67	69 R	22 R	PS	.....	T4	Northern No. 2 well.
16bca	.....	19	54	6,470	 do	6.3	1-11-67	.....	.....	D(?)	.....	.....	Dug well.
22bab	6-65	200	.....	6,445	 do	107	1-11-67	.....	.....	PS	T3	.....	Oakwood domestic well.
27cba	.....	350	.....	6,485	Volcanic rocks	.....	.....	.....	.....	PS	.....	.....	Yield insufficient in dry periods; Little Antelope Maintenance Camp No. 1 well.
27cbb	9-65	1,500	8	6,470	Supai Formation	1,279	9-7-65	26	58	PS	.....	T4	Little Antelope Maintenance Camp No. 2 well.
(A-18-9)6bb	5-61	300	8	7,250	Alluvium	.....	.....	.....	.....	N	T3	.....	Some water reported at 35 feet.
27cb	9-63	127	None	7,120	Volcanic rocks	Dry	9-17-63	.....	.....	N	T3	.....	Mormon Lake Ranger Station.
28bcb	7-63	39	8	7,110	Volcanic rocks and silt	.....	.....	29 R	.....	PS	T3	.....	Tall Pines Estates well.
28bda	.....	75	8	7,115	Volcanic rocks	20 R	.....	12 R	.....	PS	T3	.....	Mountain View Subdivision well.
29caa	.....	65	8	7,125	 do	30 R	12-1-66	.....	.....	D, PS	.....	.....	Mormon Lake Lodge well.
(A-18-12)13bbd	.....	900	8	5,780	Coconino Sandstone	680	6-22-66	.....	.....	S	.....	.....	Wofolk well.
(A-18-12)35dda	6-45	680	8	5,750	 do	590 R	6-6-45	.....	.....	S	.....	T4	Dog Valley well.
(A-18-13)13ccd	.....	475	8	5,355	 do	374	5-6-66	.....	.....	S	.....	T4	
(A-18-14)9aac	.....	450	8	5,205	 do	292	5-11-66	.....	.....	S	.....	.....	

Table 1.--Records of selected wells in southern Coconino County--Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-18-14)13abd1 .....	.....	.....	.....	5,160	Coconino Sandstone	267	9--63	.....	.....	.....	S	.....	T4	
13abd2	1952	620	16	5,163	 do	263	3-4-53	550	50	.....	PS	.....	T4	Winslow No. 1.
13baa	1953	700	16	5,170	 do	270 R	6-6-67	900 R	30 R	.....	PS	.....	T4	Winslow No. 2.
13bad	12-62	1,100	20	5,180	Coconino Sandstone and Supai Formation.	298	12--62	880 R	240 R	70	PS	T3	T4	Winslow No. 5.
13cab	6-54	900	16	5,208	Coconino Sandstone	309	11--64	400 R	104 R	.....	PS	.....	T4	Winslow No. 3.
13dbb	1954	1,000	16	5,204	Coconino Sandstone and Supai Formation.	305	11--64	400 R	142 R	.....	PS	.....	T4	Winslow No. 4.
36daa	1946	475	8	5,320	Coconino Sandstone	352	5-11-66	.....	.....	.....	S	.....	T4	
(A-18-15)5abb .....	.....	350	.....	5,110	 do .....	.....	.....	.....	.....	.....	S	.....	T4	
30bcc .....	.....	560	16	5,285	 do	341	5-11-66	.....	.....	.....	S	.....	T4	
(A-19-7)20bbb	1965	400	None	6,710	Alluvium and volcanic rocks.	Dry R	7-2-65	.....	.....	.....	N	.....	.....	
23ad	1955	970	6	7,350	Coconino Sandstone	Dry R	8-28-55	.....	.....	.....	N	T3	.....	Pine Grove well; bail test at 1,590 feet.
(A-19-9)17dd	7-67	1,700	10	6,925	Supai Formation	1,440 R	7-19-67	15 R	25 R	1½	PS	.....	.....	
22acc	7-65	207	None	7,105	Volcanic rocks	Dry R	7-7-65	.....	.....	.....	N	T3	.....	Post Lake test hole.
(A-19-10)5dbc	8-63	1,125	8	6,500	Coconino Sandstone .....	.....	.....	.....	.....	.....	N	.....	.....	Shoshone oil test.
24bdd	8-61	1,730	13	6,410	Supai Formation	1,294	6-16-66	.....	.....	.....	N	.....	.....	Western Oil and Minerals Inc. No. 1 Federal oil test; plugged back from 3,020 feet.
24cdb	2-67	6,500	.....	6,380	Supai Formation and Redwall(?) Limestone.	1,277	3-31-67	.....	.....	.....	N	.....	.....	Steinberg-Babbitt oil test.
(A-19-12)29dc	1953	753	8	5,775	Coconino Sandstone	705	2-17-67	.....	.....	.....	D,S	.....	.....	Buffalo Ranch well.
(A-19-12)13bad	3-49	690	5	5,550	 do	610 R	3--49	.....	.....	.....	PS	T3	T4	Museum well.
15cbb	12-50	760	8	5,525	 do	531	6-22-66	18 R	.....	.....	S	.....	T4	Diablo well.
(A-19-13)5adc	6-54	570	6	5,320	 do	475 R	6-26-54	.....	.....	.....	S	T3	T4	Beacon well.
7bbb .....	.....	.....	5	5,405	 do	532	11-1-66	.....	.....	.....	S	.....	T4	Clonch well.
23abb	2-49	450	6	5,235	 do	319	5-13-66	14 R	.....	.....	S	.....	T4	Ogilvie well.
29bab	3-38	603	8	5,425	 do	520	11-1-66	12 R	0 R	.....	D,S	T3	T4	Meteor Crater Ranch well.
(A-19-14)2aa .....	.....	270	5	5,050	 do	262	9-20-66	.....	.....	.....	D,S	.....	T4	Triangle V Ranch well.
2ba	8-54	726	10	5,220	 do	498	8-21-54	30	0	24	PS	.....	T4	Old Winslow Job Corps well.
4acc .....	.....	410	.....	5,080	 do	356	5-11-66	.....	.....	.....	PS	.....	T4	Hopi House well.
4bbb	8-66	600	8	5,035	 do	310	8-18-66	105	0	28	PS	T3	T4	New Winslow Job Corps well.

Table 1. --Records of selected wells in southern Coconino County -- Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-19-14)21a .....	.....	.....	8	5,050	Coconino Sandstone	313	5-11-66	.....	.....	.....	S	.....	T 4	
(A-19-15)27ac .....	.....	280	6	4,950	 do	164	3-3-53	.....	.....	.....	N	.....	.....	
28ad .....	.....	620	6	4,950	 do	166	11-20-64	.....	.....	.....	N	.....	.....	Specific conductance 1,410.
(A-19-16)6acb .....	.....	185	6	4,830	 do	46	4-30-65	.....	.....	.....	D, Irr	.....	T 4	
(A-20-6)2bbc	6-63	1,600	24	7,187	Coconino Sandstone and Supai Formation.	1,102	9-8-66	600	.....	.....	PS	.....	.....	Woody Mountain No. 5.
(A-20-7)7acd	9-65	275	None	6,890	Alluvium and Kaibab Limestone.	Dry R	9-25-65	.....	.....	.....	N	.....	.....	
7adb	1959	995	8	6,900	Supai Formation and Coconino(?) Sandstone.	949	6-7-60	.....	.....	.....	D	.....	.....	
12bba	1960(?)	987	12	6,840	Coconino Sandstone	900	6-29-65	40	.....	.....	PS	.....	.....	
12ddb	6-65	1,040	.....	6,820	 do	760	11-18-65	167	211	36	N	.....	.....	Ponderosa No. 3 well.
20dad	4-66	103	None	6,820	Alluvium and Kaibab Limestone.	Dry	4-28-66	.....	.....	.....	N	.....	.....	
28bcc	1961	990	.....	6,790	Coconino Sandstone	850 R	6- -61	.....	.....	.....	PS	T 3	.....	Mountainaire well.
30bbc	8-65	1,075	12	6,675	Coconino Sandstone and Supai Formation.	623 R	8- -65	34	20	2	PS	T 3	.....	Bail tested at 730 feet.
(A-20-8)18bbb	1962	1,174	22	6,830	 do	598	6-4-65	300	.....	.....	N	T 3	T 4	Lake Mary No. 1; plugged back from 1,287 feet.
18bcc	11-64	1,091	30	6,830	Coconino Sandstone	432	4-14-65	625	177	25	PS	.....	.....	Lake Mary No. 2.
(A-20-9)22acb .....	.....	1,465	.....	6,655	Supai Formation	Dry R	1-3-57	.....	.....	.....	N	.....	.....	
(A-20-10)1aad	1946	935	6	5,900	Coconino Sandstone	919	2-15-67	.....	.....	.....	D, S	.....	.....	
26dba	11-63	3,596	5	6,250	Supai Formation	1,164	9-29-66	.....	.....	.....	N	.....	.....	Pickett oil test.
(A-20-11)7ad	7-40	950	8	5,920	Coconino Sandstone	910 R	11-24-64	.....	.....	.....	D, S	T 3	.....	
12baa	6-62	3,624	9	5,724	 do .....	.....	.....	.....	.....	.....	S	.....	.....	Roy Owen oil test.
(A-20-12)14bd .....	.....	650	.....	5,525	 do	610 R	11-24-64	.....	.....	.....	PS	.....	.....	Two Guns T. P. well.
29ac	1939	684	8	5,625	 do	590 R	2- -39	2 R	.....	.....	S	T 3	.....	Anderson Canyon well.
34cc .....	.....	750	6	5,610	 do .....	.....	.....	.....	.....	.....	S	.....	.....	
(A-20-12½)1add .....	.....	.....	8	5,275	 do	480	5-12-66	.....	.....	.....	S	.....	T 4	
14dda .....	.....	1,155	12	5,345	 do	565	5-13-66	.....	.....	.....	S	.....	T 4	Sunshine oil test.
24ab	7-46	645	8	5,420	 do	591	10-24-66	8 R	.....	.....	N	.....	.....	
24cbb	6-45	640	8	5,405	 do	574	10-21-66	14 R	.....	.....	PS	.....	T 4	
(A-20-13)21da .....	.....	350	.....	5,100	 do	300 R	11-25-65	.....	.....	.....	D, S	.....	T 4	

Table 1. --Records of selected wells in southern Coconino County -- Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level			Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured		Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-20-13)35baa	1956	400	.....	5,090	Coconino Sandstone	310 R	12-7-64		.....	.....	.....	PS	....	.....	Specific conductance 810 ; Meteor City well.
35da .....	.....	400	10	5,110	 do	251	5-12-66		.....	.....	.....	S	....	T4	Dennison well.
(A-20-14)7b .....	.....	200	.....	4,910	 do .....	.....	.....		.....	.....	.....	S	....	T4	Red Gap well.
31cc .....	.....	300	.....	5,025	 do	240 R	5- -66		300 R	.....	.....	N	....	.....	
(A-21-2)3ba .....	.....	116	7	7,050	Volcanic rocks	100	8-16-63		40	8.5	480	D	....	T4	Lost Canyon Ranch No. 1.
(A-21-3)26ba .....	.....	.....	.....	6,726	Alluvium	0	7-18-65		.....	.....	.....	D, S	....	.....	Dug well.
(A-21-4)11aca .....	.....	47	6	6,850	Kaibab Limestone	41	9-1-49		.....	.....	.....	D	....	.....	Do.
(A-21-5)2abc1	11-26	122	12	7,128	Volcanic rocks and silt ...	21	4-21-43		.....	.....	.....	PS	T3	T4	Bellemont-Santa Fe No. 1.
2abc2	1927	335	.....	7,128	 do	Dry R	1927		.....	.....	.....	N	....	.....	Bellemont-Santa Fe No. 2; reportedly hit water at 50 feet but lost it in crevice at 230 feet.
2abc3	8-29	110	12	7,131	 do	27	3-15-67		.....	.....	.....	N	....	.....	Bellemont-Santa Fe No. 3.
2cc	1942	90	10	7,120	 do	25 R	1942		50 R	.....	.....	N	....	.....	Navajo Army Depot construction well No. 6.
11cbc	1950	1,647	12	7,043	Supai Formation	1,273	8-28-50		.....	.....	.....	PS, Ind	....	T4	Navajo Army Depot well.
(A-21-6)25cda	10-65	170	None	7,060	Volcanic rocks	Dry R	10- -65		.....	.....	.....	N	....	.....	
35bcc	10-57	1,602	24	7,130	Coconino Sandstone and Supai Formation.	1,213	11-19-58		400	.....	.....	PS	....	.....	Woody Mountain No. 3.
35cba	12-54	1,600	12	7,140	 do	1,228	12-8-54		206	68	168	PS	....	T4	Woody Mountain No. 1.
35ccb	7-56	1,746	16	7,167	 do	1,247	11-19-58		.....	.....	.....	PS	....	.....	Woody Mountain No. 2.
35ccc	11-57	1,540	24	7,166	 do	1,083	11-19-58		460	.....	.....	PS	....	T4	Woody Mountain No. 4.
(A-21-7)4adc .....	.....	65	12	7,070	Volcanic rocks	8.0	1-4-67		.....	.....	.....	D	....	.....	
5aab	10-64	120	6	7,110	Volcanic rocks and silt ...	34	10- -64		4 R	.....	.....	N	T3	.....	Cheshire No. 10.
5aac	11-64	130	None	7,095	 do	81	11- -64		1.5R	.....	.....	N	T3	.....	Cheshire No. 11.
5acc	10-64	126	6	7,095	Volcanic rocks, silt, and sand.	21	10- -64		10 R	.....	.....	N	T3	.....	Cheshire No. 9.
5baa	12-64	40	8	7,119	 do	9.0	12-8-64		60	4	6	N	....	.....	Cheshire No. 1.
5bab	11-64	170	6	7,122	Volcanic rocks, silt, sand, and gravel.	40	11- -64		3 R	.....	.....	N	T3	.....	Cheshire No. 12.
5bad	1960	26	36	7,110	 do	9.0	11- -64		10 R	7 R	2	N	....	.....	Cheshire No. 2.
5dab	12-64	155	6	7,095	Volcanic rocks and silt ...	39	12- -64		25 R	.....	.....	N	T3	.....	Cheshire No. 13.
16aaa .....	.....	805	12	6,950	Volcanic rocks	67	6-16-44		.....	.....	.....	.....	....	.....	Kaibab Limestone and Coconino Sandstone dry.

Table 1 --Records of selected wells in southern Coconino County--Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-21-7)20bdb	.....	1,620	.....	6,970	Coconino Sandstone and Supai Formation.	1,220	9-19-62	30 R	.....	.....	.....	.....	.....	
21ced	1961	1,200	.....	6,900	 do	Dry(?)	1961	.....	.....	.....	N	T3	.....	
22aad	11-57	1,433	12	6,855	Supai Formation	1,273	6-25-56	40 R	.....	.....	N	.....	T4	Ponderosa No. 1 well.
22ada	10-64	1,450	12	6,865	 do	1,234 R	10-10-64	7 R	.....	.....	N	.....	.....	Ponderosa No. 2 well.
26ab	.....	297	8	6,791	Kaibab Limestone	70 R	4-22-61	1.5R	.....	.....	N	T3	.....	
32bbc	9-56	1,200	12	6,907	Coconino Sandstone and Supai Formation.	985	10-3-56	.....	.....	.....	D, S	.....	T4	
(A-21-9)6bab	5-67	1,700	8	6,500	Supai Formation	1,302	5-1-67	26	150	5	PS	.....	.....	Mountain View Ranchos No. 1 well.
8aaa	.....	1,410	.....	6,380	 do	1,280 R	12- -61	15 R	15 R	.....	D, S	.....	.....	
10bbc	7-66	1,338	10	6,350	 do	1,227	7-30-66	7 R	.....	.....	PS	T3	.....	2-Bar-3 well.
14acc	.....	1,320	8	6,320	Coconino Sandstone and Supai Formation.	1,205	6-24-66	7.5	8.8	2	PS	.....	T4	Winona T P. well.
14ceb	1965	1,315	6	6,320	 do	1,215 R	1965	.....	.....	.....	D, S	T3	.....	
15dcb	1922	90	30	6,250	Alluvium	Dry	3-5-59	.....	.....	.....	N	.....	.....	Water level 57 feet in June 1944.
(A-21-10)16bd	.....	1,050	8	6,025	Coconino Sandstone	990 R	12-21-61	13 R	0 R	.....	D, S	T3	.....	
(A-21-11)19bc	.....	915	8	5,820	 do	785 R	.....	14 R	0 R	.....	S	.....	.....	
24d	2-35	738	6	5,510	 do	617	5-12-54	6	.....	.....	D, S	T3	T4	Tribal well 5M-122.
31cd	.....	1,000	.....	5,860	 do	940 R	2-16-67	.....	.....	.....	PS	.....	.....	Toonerville well.
(A-21-12)3cb	3-55	812	8	5,330	 do	618	3-16-55	10	0	$\frac{3}{4}$	D, S	.....	T4	Tribal well 5K-317.
17bd	4-55	717	8	5,340	 do	530	4-22-55	14	0	$1\frac{1}{4}$	D, S	.....	T4	Tribal well 5K-316.
(A-21-12½)14ac	1924	388	6	5,040	 do	324	3-30-53	10	.....	.....	D, S	.....	T4	Tribal well 5M-94.
36bd	9-55	553	8	5,180	 do .	460	9-16-55	10	0	$\frac{3}{4}$	D, S	T3	.....	Tribal well 5T-320.
(A-21-13)4ba	.....	.....	6	4,795	Kaibab(?) Limestone and Coconino Sandstone	122	11-22-65	.....	.....	.....	D, S	.....	T4	Tribal well 5T-506.
22ad	1924	253	6	4,800	Coconino Sandstone	140	1-22-53	10	.....	.....	D, S	T3	T4	Tribal well 5M-86.
35bc	1924	426	6	4,870	 do	223	5-11-54	10	.....	.....	D, S	.....	T4	Tribal well 5M-88.
(A-21-14)9dd	10-53	540	12	4,810	Kaibab Limestone and Coconino Sandstone.	103	10-16-53	37	.....	$\frac{1}{2}$	S	.....	T4	Tribal well 5K-313.
25cc	10-55	440	10	4,900	Coconino Sandstone	216	10-12-55	15	0	$\frac{1}{2}$	S	.....	T4	Tribal well 5T-319.
(A-22-2)27d	1929	1,020	.....	6,800	 do	Dry R	1929	.....	.....	.....	N	T3	.....	Santa Fe-Williams No. 3.
29dab	1963	2,500	.....	6,735	Supai Formation	Dry R	1963	.....	.....	.....	N	.....	.....	
(A-22-3)10ab	.....	2,340	.....	6,957	 do	Dry R	.....	.....	.....	.....	N	.....	.....	EPNG-Williams No. 1

Table 1 --Records of selected wells in southern Coconino County --- Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-22-3)26bca	12-65	522	None	6,925	Volcanic rocks	Dry R	12-2-65	.....	.....	.....	N	T3	.....	Seep reported at base of volcanic rocks.
(A-22-4)8dac .....	.....	2,570	.....	7,240	Supai Formation	Dry R	.....	.....	.....	.....	N	.....	.....	EPNG-Williams No. 3.
26dc	1950	124	6	7,100	Volcanic rocks	102	8-15-50	6	3	.....	.....	T3	T4	.....
(A-22-5)16dbc	1966	480	6	7,470	 do	402	1-4-67	29	.....	.....	D	.....	.....	Transwestern Station No. 2.
26ab	3-53	550	.....	7,230	 do	Dry R	3-1-53	.....	.....	.....	N	.....	.....	EPNG-Williams No. 2.
26ad1	8-53	2,151	.....	7,230	Supai Formation	2,010 R	8-3-53	20	.....	.....	N	.....	.....	EPNG-Williams No. 6.
26ad2	7-53	2,350	14	7,232	 do	2,120 R	7-1-53	.....	.....	.....	N	.....	.....	EPNG-Williams No. 5.
(A-22-6)23bcb .....	.....	191	7	7,390	Volcanic rocks	150 R	.....	1.2R	.....	.....	S	T3	.....	.....
23cdc	1961	112	6	7,320	 do	90 R	1961	.....	.....	.....	N	.....	.....	.....
23cdd	1962	160	6	7,325	 do	100 R	1962	12 R	.....	.....	D	.....	.....	.....
23dba .....	.....	185	6	7,350	 do	65 R	.....	1.5R	.....	.....	D	T3	.....	Plugged back from 276 feet.
23dca	1964	114	6	7,335	 do .....	.....	.....	20 R	0 R	.....	D	T3	.....	.....
25cac1 .....	.....	80	6	7,295	 do	40 R	.....	50 R	.....	.....	D	.....	.....	.....
25cac2 .....	.....	258	6	7,300	Volcanic rocks, silt, sand, and gravel.	170 R	.....	1.2	.....	.....	D	T3	.....	.....
25cbd	10-63	260	6	7,295	Volcanic rocks, silt, and Moenkopi Formation.	169 R	10-18-63	15 R	.....	.....	D	T3	.....	.....
26aaa	1960	1,540	16	7,340	Volcanic rocks, silt, and gravel.	.....	.....	.....	.....	.....	N	T3	.....	Cascading water at 131 feet; Coconino Sandstone and Supai Formation dry.
26daa	1-63	227	6	7,300	Alluvium and volcanic rocks.	.....	.....	5 R	.....	.....	S	T3	.....	.....
27cdd	1962	147	6	7,340	 do	81 R	6-1-67	.....	.....	.....	D	.....	.....	.....
(A-22-7)32cbb	7-60	202	6	7,175	Moenkopi(?) Formation .	180 R	7- -60	4 R	20 R	.....	D	T3	.....	.....
32ccc	12-61	128	6	7,155	Volcanic rocks	99 R	12-20-61	25 R	.....	.....	D	.....	.....	.....
32dda	10-57	200	6	7,180	Moenkopi Formation .	.....	.....	3 R	.....	.....	D	T3	.....	.....
33cca	4-67	137	6	7,165	Volcanic rocks, silt, and sand.	80 R	4-11-67	5	.....	.....	N	T3	.....	Plugged back from 210 feet.
33cdd .....	.....	100	12	7,150	 do	40 R	.....	23 R	35 R	1½	N	.....	.....	.....
34dc	7-60	370	7	7,225	Moenkopi Formation	175 R	7-22-60	15 R	.....	.....	N	T3	.....	.....
(A-22-8)16dad	7-63	1,755	.....	6,745	Supai Formation	1,635 R	7- -63	11 R	15 R	3	N(?)	T3	.....	ATT-Flagstaff well.
24cc	1913	50	.....	6,540	Alluvium	38	3-16-60	.....	.....	.....	.....	.....	.....	Dug well; dry on April 25, 1961.
32cda	1954	107	4	6,965	 do	Dry R	1954	.....	.....	.....	.....	.....	.....	.....

Table 1 --Records of selected wells in southern Coconino County--Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data		Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw down (feet)				
(A-22-8)33bda	1955(?)	410	8	6,770	Alluvium and Kaibab Limestone.	Dry R	1955	.....	.....	.....	T3	.....	
35aac	11-57	1,550	8	6,550	Supai Formation	1,457	6-20-66	25	.....	PS	.....	T4	
(A-22-9)29bac	3-59	1,450	6	6,550	 do	1,390 R	2-11-59	.....	.....	D,S	T3	T4	
(A-22-10)3aca .....	.....	2,400	12	5,710	 do	1,138	10-5-66	.....	.....	S	.....	T4	Flagstaff Associates-Kellum No. 1 oil test.
(A-22-11)19cc .....	.....	1,050	6	5,545	Coconino Sandstone	1,000 R	10- -54	10	.....	S	.....	T4	
35bc	4-50	1,161	6	5,350	Coconino Sandstone and Supai Formation.	732	5-12-54	12	.....	S	T3	T4	Tribal well 5M-103.
(A-22-12)11cb	10-52	687	8	4,990	Coconino Sandstone	335	10-20-52	200	15	D,Ind	.....	T4	EPNG-Leupp No. 1.
15ab	1924	400	6	5,030	 do	379	4-14-53	10	.....	D,S	.....	T4	Tribal well 5M-108.
17bc	3-55	818	10	5,220	 do	640	3-24-55	17	0	D,S	.....	T4	Tribal well 5K-315A.
25dd	10-52	632	10	5,030	 do	379	2-27-53	40	0	D,S	.....	T4	Tribal well 5K-309.
(A-22-12)36cd	6-61	570	6	4,885	 do .....	.....	.....	.....	.....	D,S	.....	T4	Tribal well 5T-507.
(A-22-13)7ca	5-65	162	.....	4,710	Kaibab Limestone and Coconino(?) Sandstone.	75 R	6-4-65	15	0	D,S	.....	.....	Tribal well 5T-518.
18ad .....	.....	200	6	4,710	 do	85	1-22-53	.....	.....	PS	.....	T4	Sunrise T. P. well.
18bc	3-59	400	10	4,730	Kaibab(?) Limestone and Coconino Sandstone.	125 R	3-31-59	75	.9	PS	.....	T4	New Leupp School, P. M. No. 2.
18cb	4-61	425	9	4,765	 do	140	4-28-61	35	.5	D,S	.....	T4	Tribal well 5T-505.
18da	4-64	464	.....	4,722	Kaibab Limestone and Coconino Sandstone.	101	4-6-64	123	5	PS	.....	T4	Tribal well 5T-510.
(A-23-5)27aac	7-65	760	.....	7,661	Volcanic rocks	727 R	7-27-65	.....	.....	S	.....	.....	
(A-23-6)3cc	1935	22	30	7,875	Alluvium	8.8	7-12-49	.....	.....	N	.....	.....	Dug well.
6dca .....	.....	10	48	7,911	 do	4.2	6-2-67	.....	.....	S	.....	.....	Dug well; Madersbach well.
(A-23-7)28ddd	9-66	245	10	9,780	 do	132	10-10-66	300 R	4 R	N	.....	.....	Inner Basin No. 2.
33aab	9-66	357	4	9,835	 do	159	10-10-66	.....	.....	N	.....	.....	Inner Basin No. 1.
(A-23-8)16dedl	3-63	604	.....	6,925	Volcanic rocks, silt, sand, and gravel.	Dry R	3- -63	.....	.....	N	T3	.....	Sunset Crater Natl. Monument test hole.
16ded2	3-65	2,200	8	6,925	Supai Formation	1,944	3-30-65	21	64	PS	.....	T4	Sunset Crater Natl. Monument well.
(A-23-10)1bb .....	.....	..	8	5,035	Coconino(?) Sandstone	740	10-19-54	6	.....	S	.....	T4	Rhoton Spring well.
13dc .....	.....	..	8	5,200	 do	859	10-19-54	6	.....	S	.....	T4	
(A-23-11)28a	8-36	757	6	5,150	Coconino Sandstone	646	5-12-54	6	...	D,S	T3	T4	Tribal well 5M-104.
(A-23-12)17de	1-55	422	8	4,850	 do	312	4-7-55	18	0	D,S	.....	T4	Tribal well 5K-318

Table 1 --Records of selected wells in southern Coconino County--Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-23-12)26c	10-53	380	8	4,840	Coconino Sandstone	231	5-11-54	18	0	$\frac{1}{2}$	D,S	.....	T4	Tribal well 5K-314.
(A-24-1)16dcb	10-57	395	8	5,910	Kaibab Limestone and Torowcap Formation.	348	1-5-67	.....	.....	.....	N	T3	.....	
29ced	10-60	1,140	None	5,980	Coconino Sandstone and Supai Formation.	Dry	10- -60	.....	.....	.....	N	T3	.....	Perrin No. 2 well.
(A-24-5)11cac	6-65	346	6	7,388	Volcanic rocks and sand ..	280	6- -65	60	13	24	N	T3	T4	
11cdb	8-55	292	6	7,386	Volcanic rocks	275	6- -65	100 R	.....	720 R	S	T3	.....	
(A-24-6)17bcd	6-66	302	.....	7,453	 do	266	6-26-66	.....	.....	.....	S	.....	.....	Antelope well.
(A-24-8)29ab .....	.....	1,262	8	6,400	Coconino Sandstone	Dry R	1955	.....	.....	.....	N	.....	.....	
29ca .....	.....	285	.....	6,450	Volcanic rocks	Dry R	.....	.....	.....	.....	N	.....	.....	
(A-25-1)22bd	1946	109	6	5,775	Alluvium	86	1-5-67	.....	.....	.....	S	T3	.....	
(A-25-5)21c .....	.....	300	None	7,000	Volcanic rocks	Dry R	.....	.....	.....	.....	N	.....	.....	Red Mountain well.
27ccb	1-61	320	None	6,895	Volcanic rocks and gravel.	Dry R	1- -61	.....	.....	.....	N	T3	.....	Upper Slate Mountain well.
(A-25-6)20acc .....	.....	139	.....	6,968	 do	86	10-3-66	.....	.....	.....	N	.....	.....	
20baa	3-61	60	6.5	6,815	Alluvium	30	10-3-66	50 R	.....	.....	N	T3	.....	
20bbb	2-61	437	5	6,580	Chinle Formation (Shinarump Member) and Moenkopi(?) Formation.	407 R	2- -61	15 R	0 R		D,S	T3	.....	
20bdd	1953(?)	112	6	6,965	Volcanic rocks	83	10-3-66	70 R	.....	.....	S	T3	T4	Plugged back from 142 feet.
29(?) .....	.....	730	8	7,100	Chinle Formation (Petrified Forest Member)	.....	.....	4 R	.....	.....	N	.....	.....	
33ccb .....	.....	450	.....	7,195	Volcanic(?) rocks	374	10-3-66	10 R	.....	.....	N	.....	.....	
(A-25-9)6cca	12-66	1,800	8	5,380	Supai Formation	1,583	1-23-67	17.5	5	24	PS	T3	T4	Citadel well.
(A-25-10)30bca	10-58	904	10	4,855	Coconino Sandstone	781	10-27-58	50	45	24	PS	.....	T4	Wupatki Natl. Monument Headquarters well.
(A-26-2)8aca	1964	375	None	5,870	Kaibab Limestone	Dry R	6-28-65	.....	.....	.....	N	.....	.....	
11aad	1937	1,800	8	5,990	Supai Formation	1,600 R	.....	1	200	.....	N	.....	.....	
(A-26-8)1b	2-57	1,550	..	5,200	Coconino Sandstone and Supai Formation	1,475 R	2-23-57	15 R	.....	.....	D,S	T3	T4	Spider Web headquarters well.
36bc	1925(?)	1,662	8	5,350	Supai Formation	1,550 R	1954	.....	.....	.....	N	.....	.....	
(A-26-9)15a .....	.....	1,250	6	5,080	 do	1,152 R	.....	18 R	.....	2	S	T3	.....	Bar Doney well
38aac	1-62	1,440	8	7,315	 do	1,343	10-22-54	15 R	0 R	48	S	T3	.....	

Table 1.--Records of selected wells in southern Coconino County--Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data		Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)				
(A-26-10)9cda	.....	.....	6	4,250	Coconino Sandstone	259	11-10-66	.....	.....	S	.....	T4	River well.
..... 9lea	1950	1,009	3	5,085	 do	927	10-22-54	13 R	0 R	S	.....	T4	
(A-27-1)29c	11-46	1,470	..	5,550	Hermit Shale	.....	.....	.....	.....	N	T3	.....	Seep reported at 1,285 feet.
(A-27-1)13bbb	.....	.....	12	6,450	Coconino Sandstone and Supai(?) Formation.	Dry(?)	8-12-66	.....	.....	N	.....	.....	
..... 23dec	.....	2,250	.....	6,415	Supai Formation	Dry R	1- -66	.....	.....	N	.....	.....	
(A-27-7)24bbc	11-51	300	.....	5,390	Alluvium and volcanic rocks.	Dry	11- -51	.....	.....	N	.....	.....	Tribal well 3T-314.
..... 23cdb	12-51	133	.....	5,395	 do	Dry	12- -51	.....	.....	N	.....	.....	Tribal well 3T-314A.
(A-27-9)6dc1	9-55	1,408	8	5,030	Supai Formation	1,250	9-30-55	6 R	.....	PS	.....	T4	Gray Mountain T. P. No. 1 well.
..... 6dc2	1963(?)	1,500	8	5,030	 do	1,308 R	5-12-66	20 R	.....	PS	.....	T4	Gray Mountain T. P. No. 2 well.
..... 7abb	1958	1,613	.....	5,040	 do .....	.....	.....	25 R	.....	PS	.....	T4	
..... 7baa	3-67	1,450	8	5,040	 do	1,150 R	3-10-67	8 R	.....	PS	.....	.....	Pickens-Myers well.
..... 11ddd	.....	.....	.....	4,590	Coconino Sandstone	706	11-10-66	7 R	.....	S	.....	T4	Maize Wash well.
..... 15ccc	4-48	2,165	12	5,100	Supai Formation	.....	.....	.....	.....	S	.....	.....	Barron-Steele oil test.
..... 21aaa	2-49	3,624	12	5,096	 do	1,309	10-5-66	.....	.....	N	.....	.....	Lockhart-Babbitt oil test.
(A-27-10)6abc	8-34	8	60	4,320	Chinle Formation (Shinarump Member).	4.0	11-10-66	.....	.....	D.S	.....	T4	Dug well.
..... 6-58	.....	1,320	8	4,915	Coconino Sandstone	1,146	3-24-64	15 R	120 R	D.S	.....	T4	Tribal well 3T-341.
(A-28-9)33bac	4-55	823	6	4,410	Kaibab Limestone	641	3-21-55	14	0	S	T3	T4	Tribal well 3K-331.
(A-29-1)29b	.....	1,275	..	5,760	Coconino Sandstone	.....	.....	.....	.....	N	T3	.....	Anita No. 1 well.
..... 29dc	4-58	1,130	.....	5,775	Hermit(?) Shale	1,020 R	4- -58	.5	.....	N	T3	.....	Anita No. 2 well.
(A-29-2)16	1904	514	.....	6,150	Toroweap(?) Formation	500 R	1904	.....	.....	N	.....	.....	Anita Copper Co. shaft.
(A-29-6)5dbc	.....	1,410	3	6,130	Coconino Sandstone and Supai Formation	Dry	8-6-67	.....	.....	N	.....	.....	77-Bar Ranch well.
(A-29-9)24c	4-51	1,012	10	4,230	Kaibab Limestone and Coconino Sandstone.	600	3- -51	17	.....	N	.....	T4	Cameron test No. 2.
(A-30-2)17	1930(?)	1,000	.....	6,425	Coconino Sandstone	Dry R	.....	.....	.....	N	T3	.....	Santa Fe-Anita well.
..... 24a	.....	623	.....	6,600	Toroweap Formation	550 R	10-17-66	1.5	.....	N	...	.....	Thurston No. 1 well; plugged back from 735 feet.
..... 24b	9-66	720	10	6,550	 do	512	10-17-66	5	.....	N	T3	.....	Thurston No. 3 well.
..... 25b	.....	620	.....	6,650	 do .....	.....	.....	5	.....	N	T3	.....	McAfee-Meeks No. 2 well
..... 26a	11-51	.....	.....	6,775	 do	550 R	4-1-64	4.5	90	PS	T3	T4	McAfee-Meeks No. 1 well, plugged back from 1,400 feet

Table 1 --Records of selected wells in southern Coconino County -- Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(A-31-2)33abb . . . . .	.....	.....	18	6,675	Kaibab Limestone	14	12-9-64	..	.....	.....	N	.....	.....	Rowes well; dug well.
(B-21-2)3ddd	1900	1,025	8	5,125	Volcanic(?) rocks	Dry	R 1900	.....	.....	.....	N	.....	.....	Reportedly volcanic rocks from 0 to 1,025 feet.
(B-21-3)11cab . . . . .	.....	1,000	.....	5,035	Martin(?) Limestone and Muav(?) Limestone.	Dry	R 2-7-66	.....	.....	.....	N	.....	.....	
15dec . . . . .	.....	1,300	.....	5,015	 do	Dry	R 2-7-66	.....	.....	.....	N	.....	.....	
(B-22-1)30ada	10-31	2,624	.....	5,530	Redwall(?) Limestone and Martin(?) Limestone.	2,060	R 10-28-31	5	0	.....	N	.....	.....	Santa Fe-Ash Fork test.
(B-22-2)9dec . . . . .	.....	45	36	5,200	Alluvium	9, 2	4-20-67	42 R	.....	72 R	N	.....	.....	Dug well.
35	1941(?)	1,123	10	5,225	Redwall(?) Limestone and Martin(?) Limestone.	Dry	R 1941	.....	.....	.....	N	.....	.....	Do.
36abb . . . . .	.....	48	36	5,320	Alluvium and volcanic rocks.	47	12-2-66	.....	.....	.....	N	.....	.....	
(B-22-4)18 . . . . .	.....	2,300	.....	5,700	Muav(?) Limestone	Dry	R 5- -66	.....	.....	.....	N	.....	.....	
36aab . . . . .	.....	1,300	.....	5,325	Redwall Limestone and Martin(?) Limestone.	Dry	R 5- -66	.....	.....	.....	N	.....	.....	
(B-23-6)36	5-01	229	.....	5,250	Volcanic(?) rocks	Dry	R 6- -01	.....	.....	.....	N	.....	.....	Santa Fe-Seligman No. 1.
36	8-01	302	.....	5,250	 do	Dry	R 8- -01	.....	.....	.....	N	.....	.....	Santa Fe-Seligman No. 2.
36	1902	1,403	.....	5,250	Redwall(?) Limestone	Dry	R 1902	.....	.....	.....	N	.....	.....	Santa Fe-Seligman No. 3.
(B-23-7)10cdd	5-64	850	6	5,152	Redwall Limestone and Martin(?) Limestone.	527	R 3-20-64	5	.....	.....	D	.....	T 4	ATT-Seligman well.
(B-24-8)17dcl	3-24	1,788	16	5,180	Muav Limestone and Tapeats Sandstone.	802	R 3-17-24	75 R	.....	24	D, S	T 3	.....	Santa Fe-Pica No. 3.
17dc2	7-39	1,750	.....	5,180	 do	824	R 7-15-39	146 R	.....	24	D, S	.....	.....	Santa Fe-Pica No. 5.
17dd1	5-04	1,546	10	5,180	 do	780	R 5-10-04	28 R	.....	24	N	.....	.....	Santa Fe-Pica No. 1.
17dd2	3-11	1,634	12	5,180	 do	800	R 3- -11	35 R	.....	24	S	.....	.....	Santa Fe-Pica No. 2.
17dd3	1931(?)	1,422	.....	5,180	 do . . . . .	.....	.....	.....	.....	.....	N	.....	.....	Santa Fe-Pica No. 4; tools stuck in hole at 860 feet.
(B-25-3)3cc	6-62	140	.....	5,950	Volcanic rocks	80	R 1-5-67	40 R	.....	.....	D, S	T 3	.....	Espee No. 3 well.
(B-25-8)34aa	7-58	1,943	.....	5,250	Muav(?) Limestone and Tapeats Sandstone.	1,185	R 4-19-58	.....	.....	.....	N	.....	.....	Ray Terry oil test.
(B-25-9)26(?)	2-60	1,700	5	5,500	Muav Limestone	1,385	R 2- -60	10 R	.....	.....	N	.....	.....	
(B-25-10)10adc	1964	82	.....	5,300	Redwall Limestone	Dry	R 1964	.....	.....	.....	N	T 3	.....	
(B-26-3)19b	1962	354	.....	6,015	Volcanic rocks, silt, sand, and gravel.	Dry	R 1962	.....	.....	.....	N	T 3	.....	Espee No. 1; seeps reported at 122 feet and 186 feet.

Table 1 --Records of selected wells in southern Coconino County—Continued

Location	Date completed (month, year)	Reported depth of well (feet)	Diameter of casing (inches)	Land-surface altitude (feet above mean sea level)	Water-bearing strata	Static water level		Bail or pump-test data			Use of water	Well log	Chemical analysis	Remarks
						Feet below land surface	Date measured	Rate (gpm)	Draw-down (feet)	Duration of test (hours)				
(B-26-3)20bd	1962	98	6	6,025	Volcanic rocks	52	1-5-67				N			Espee No. 2 well.
(B-27-1)3			8	5,675	Coconino (?) Sandstone	1,400	5-4-58				N			
(B-27-6)1adc		128	10	5,925	Alluvium	72	5-3-66	73	8	24	S		T4	Rose well.
(B-27-7)28ba			8	5,870	Alluvium (?)	422	5-3-66				N			
(B-28-1)35ac	1952	3,544	13	6,005	Supai (?) Formation						N			Sinclair-Santa Fe-Pacific No. 1 oil test.
(B-28-3)12	8-62	1,400		5,525	Coconino Sandstone	Dry	8- -62				N	T3		Seep reported at about 1,140 feet.
(B-28-7)31c	1964	150	14	6,030	Alluvium	56	4- -64	30	90	6	S	T3	T4	Frazier Well No. 2.
(B-28-8)24daa			6	6,200	do	125	1-29-65				D,S		T4	Upper Frazier Well.
25ddd	1932		6	6,100	do	74	6-3-66				N			Frazier Well School well.
27d			48	6,225	Alluvium (?)	47	6-3-66				S			
(B-29-1)12dbd	5-58	1,080	8	5,675	Coconino Sandstone	959	10-17-66	2			S	T3	T4	Anita No. 3 well.
(B-30-1)28aaal	9-42	990	8	5,715	do						N	T3		Tools reportedly lost in hole.
28aaa2	1943	1,020	8	5,725	do	938	10-14-66				D,S		T4	
28baa	9-60	1,051		5,680	do	905	9- -60	5	R		N	T3		

Table 2. --Records of selected springs in southern Coconino County

Location: See p. 3 for description of well-numbering and location system.
 Range of discharge measurements: E, estimated; M, measured; R, reported.

Chemical analysis: T4, chemical analysis included in table 4.

Location	Land-surface altitude (feet above mean sea level)	Source rock	Range of discharge measurements (gpm)	Chemical analysis	Remarks
(A-11-14)35d	6,800	Supai Formation	1,290 M	.....	
(A-12-7)14	4,320	Naco Formation	18,600 M	T4	Fossil Springs.
(A-12-12)33bac	6,500	Supai Formation	900 M	T4	Tonto Spring.
(A-14-8)32aa	5,080	Coconino Sandstone	1,000 E	T4	Buckhorn Spring.
(A-15-7)14acc	4,995	 do	1,350 E	T4	Wet Beaver Creek Springs; head of perennial flow in Wet Beaver Creek.
(A-17-3)5db	3,600	Redwall Limestone	2,275-2,700 M	T4	Summers Springs.
(A-31-2)7	3,750	Muav Limestone	210 M	T4	Hermit Springs.
13abb	3,740	 do	300 R	T4	Indian Gardens Spring.
(A-32-7)31b	3,165	 do	41,070-43,490 M	T4	Blue Spring.
(A-33-6)33b .....	.....	..... do	97,430-100,130 M	T4	Composite of all spring flow from Blue Spring to river mile 3.1.
(B-27-9)16d	3,800	 do	>300 M	T4	Diamond Spring.
(B-33-4)26	3,250	Pennsylvanian limestone unit ...	28,690-29,900 M	T4	Havasut Spring.
(B-33-7)30(?)	1,700	Muav Limestone	2,700-3,600 E	T4	Warm Spring.

Table 3. --Modified drillers' logs of selected wells in southern Coconino County

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-12-13 $\frac{1}{2}$)1bbs					
QUATERNARY:			PERMIAN:		
Alluvium:			Coconino Sandstone:		
Soil	15	15	Sandstone, light-cream, Coconino, broken	385	400
			Coconino, pink and red; water at 770	412	812
(A-13-7)14hab					
QUATERNARY:			Sandstone, dark-gray	50	315
Alluvium:			Sandstone, light-gray	30	345
Rocky top soil	4	4	Sandstone, dark-gray	90	435
Clay and boulders	24	28	Basalt, black	27	462
QUATERNARY AND TERTIARY:			Sandstone, dark-gray	20	482
Volcanic rocks, sand, and gravel:			Sandstone, red, quite a bit of lime	38	520
Malpais, black, solid	17	45	Sand, gray and red	73	593
Volcanic ash, red	7	52	Basalt, black	60	653
Malpais, broken	60	112	Sandstone, red	3	656
Malpais, black, solid	38	150	Basalt, black	9	665
Gray sandstone and quartz	62	212	Sandstone, red	18	683
Sandstone, red	18	230	Sandstone, reddish-gray	10	693
Sandstone, gray	12	242	Basalt, black	41	734
Basalt, black	8	250	Sandstone, red	29	763
Sandstone, red	15	265	Basalt, black	37	800
(A-13-10)25caa					
QUATERNARY:			Sandstone, broken; some moisture	6	368
Alluvium:			Sandstone, uniform; slight moisture		
Mud	94	94	noted in cuttings	82	450
PERMIAN:			Sandstone, broken, quite soft; large		
Kaibab Limestone:			quantity of water at 461 feet	11	461
Limestone, decomposed; slight amount of			Sandstone, broken; increased water	19	480
moisture	17	111	Sandstone, hard	38	518
Limestone, decomposed; broken area from			Sandstone, hard, very little change	97	615
135 to 146 feet	36	147	Sandstone, hard, no change	11	626
Coconino Sandstone:			Soft and broken formation	26	652
Sandstone, very little change	179	326	Sandstone, medium-hard	74	726
Sandstone, quite uniform	36	362			
(A-14-11)9adc					
QUATERNARY:			Lime, white, hard	49	197
Alluvium:			Lime, cream-colored, soft	7	204
Soil	4	4	Lime, dark-yellow, hard	6	210
PERMIAN:			Limestone, white	98	308
Kaibab Limestone:			Limestone, tan	78	386
Lime, gray, hard; bad start	19	23	Coconino Sandstone:		
Lime, cream-colored, hard	28	51	Coconino, white	50	436
Lime, light-pink, hard	19	70	Coconino, pink	12	448
Lime, white, hard	12	82	Coconino, tan; hit water at 530 feet	115	563
Lime, white, broken	15	97	Coconino, cream	35	598
Lime, buff-colored, medium-hard	10	107	Coconino, light-brown	42	640
Lime, brown, hard	26	133	Coconino, light-gray	30	670
Lime, dark-gray, broken, cavey	15	148			
(A-14-11)9dca					
QUATERNARY:			Clay, red	30	145
Alluvium:			Limestone	250	395
Lime boulders and clay	8	8	Coconino Sandstone:		
PERMIAN:			Coconino, hard	115	510
Kaibab Limestone:			Coconino with a little water	30	540
Lime, requires blasting to keep straight	107	115	Coconino with a large amount of water	125	665
(A-14-11)12bcd					
PERMIAN:			Limestone, red	8	71
Kaibab Limestone:			Limestone, buff	13	84
Limestone, broken	4	4	Limestone, red	8	92
Limestone, buff, hard	29	33	Limestone, buff, sandy, small seep of		
Limestone, pink, sandy	5	38	water	21	113
Limestone, white, sandy, in part very hard	25	63	Limestone, gray, sandy	35	148

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-14-11)12bcd—Continued					
Limestone, hard, white	30	178	Sandstone, gray	33	365
Limestone, buff, sandy	12	190	Sandstone, buff	20	385
Limestone, gray, sandy	52	242	Sandstone, white; water-bearing stratum,		
Limestone, buff	8	250	water rose to 383 feet	8	393
Limestone, gray	18	268	Sandstone, white, coarse, hard	55	448
Limestone, yellow, sandy	20	288	Sandstone, gray, hard	9	457
Coconino Sandstone:			Sandstone, white; water-bearing stratum,		
Sandstone, white	3	291	water rose to 372 feet	4	461
Sandstone, hard, yellow	16	307	Sandstone, buff	16	477
Sandstone, white	25	332			
(A-16-9)28cbc					
QUATERNARY:			Cinders, soft, water	14	32
Alluvium:			Clay	6	38
Dirt	3	3	Cinders, water	28	66
TERTIARY:			Clay, dry	40	106
Volcanic rocks and silt:			Malpais, boulders, hard cinders, won't		
Malpais and cinder cap	15	18	hold water	29	135
(A-17-6)18add2					
QUATERNARY:			Sandstone, white	11	205
Alluvium:			Sandstone, pink	27	232
Top soil	2	2	Sandstone, red	11	243
PERMIAN AND PENNSYLVANIAN:			Sandstone, pink	7	250
Supai Formation:			Sandstone, purple	22	272
Sandstone, red	58	60	Sandstone, red	8	280
Crevice	5	65	Sandstone, gray	15	295
Sandstone, red	55	120	Sandstone, gray, soft	37	332
Sandstone, red, with quartz	13	133	Sandstone, red	18	350
Sandstone, red, hard	61	194			
(A-17-7)4ddc					
QUATERNARY AND TERTIARY:			Cinders, red, hard in streaks	22	197
Alluvium:			Basalt, hard, broken	15	212
Clay, brown: 1½ gpm at 72 feet	140	140	Basalt, hard	39	251
Lava sand	3	143	Cinders, broken	2	253
TERTIARY:			Basalt, broken	3	256
Volcanic rocks:					
Basalt, hard, broken	32	175			
(A-18-5)29adc					
QUATERNARY:			Shale, red	10	321
Alluvium:			Sandstone, brown, hard	137	458
Boulders, sand, and gravel	21	21	Shale, red, caving	19	477
PERMIAN AND PENNSYLVANIAN:			Lime, white and gray	71	548
Supai Formation:			Lime, red, sandy	44	592
Sandstone, red	19	40	Lime, white	51	643
Shale, red	4	44	Lime, red and brown; first water at		
Sandstone, red, hard	75	119	680 feet	37	680
Shale and sandstone, red, medium-hard	9	128	Shale, brown	2	682
Sandstone, brown, hard	54	182	Lime, gray	112	794
Shale, red; thin layers of sandstone	11	193	Sandstone, gray, very hard	7	801
Sandstone, red, hard	26	219	Shale, red	7	808
Sandstone, gray, hard	55	274	Lime, gray and brown	8	816
Sandstone, dark-red	17	291	Layers of brown shale and lime	9	825
Light-gray sandstone, pink shale, and			Conglomerate, lime, shale, sand, and clay;		
hard limestone	14	305	large stream of water	10	835
Sandstone, red	6	311	Lime, brown, gray, and red	17	852
(A-18-7)15ccb2					
QUATERNARY AND TERTIARY(?):			Sand, gravel, and cinders	120	205
Alluvium:					
Clay, heavy	85	85			

Table 3. --Modified drillers' logs of selected wells in southern Coconino County -- Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-18-7)22bab					
QUATERNARY AND TERTIARY(?): Alluvium: Clay, heavy	125	125	Sand, gravel, and cinders	75	200
(A-18-9)6bb					
QUATERNARY: Alluvium: Soil Clay, white, soft; small stream of water	5	5	at 35 feet Clay, white, soft Conglomerate, sandy, hard Clay, light-brown	35 155 60 45	40 195 255 300
(A-18-9)27cb					
QUATERNARY: Alluvium: Adobe topsoil Clay, brown Clay, yellow Clay, brown TERTIARY: Volcanic rocks: Dark cinders and red clay	3 12 30 19 8	3 15 45 64 72	Conglomerated cinders Lava, hard Lava, soft, porous Hard lava and layers of brown clay Lava, very hard Cinders, soft, cemented Lava, very hard	10 6 3 25 7 3 1	82 88 91 116 123 126 127
(A-18-9)28bcb					
QUATERNARY: Alluvium: Soil and clay, black Clay, light color to yellow; water, about 5 gpm	4 12	4 16	TERTIARY: Volcanic rocks and silt: Lava, very hard Cinders, some clay, water, about 29 gpm Lava, blue, very hard	11 10 2	27 37 39
(A-18-9)28bda					
QUATERNARY: Alluvium: Soil Clay, yellow; first water at 20 feet Clay, blue-green	4 16 36	4 20 56	TERTIARY: Volcanic rocks: Lava, streaked, hard and scoriaceous; water increased with depth	19	75
(A-18-14)13bad					
TRIASSIC: Moenkopi Formation: Sandstone, red, Moenkopi Sandstone, yellow PERMIAN: Kaibab Limestone: Limestone, yellow Limestone, grav. sandy Coconino Sandstone: Sandstone, gray; first water at 300 feet	20 5 15 130 480	20 25 40 170 650	Sandstone, brown Sandstone, gray Sandstone, light-brown Sandstone, gray Sandstone, light-brown PERMIAN AND PENNSYLVANIAN: Supai Formation: Silty sandstone, brown, fine Sandstone, reddish-brown, fine Silty sandstone, reddish-brown, fine	3 234 18 19 31 65 55 25	653 887 905 924 955 1,020 1,075 1,100
(A-19-7)23ad					
QUATERNARY: Alluvium: Soil TERTIARY: Volcanic rocks: Malpais, solid Cinders and malpais Silt and sand: Clay and sand	14 51 360 125	14 65 425 550	Clay, muddy PERMIAN: Kaibab Limestone: Tufa and lime Toroweap Formation and Coconino Sandstone undifferentiated: Sandstone	55 95 270	605 700 970

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-19-9)22acc					
QUATERNARY:			Malpais, broken	130	180
Alluvium:			TRIASSIC:		
Clay, brown, heavy	15	15	Moenkopi Formation:		
Sand, gravel, and a few cinders	20	35	Moenkopi	27	207
TERTIARY:					
Volcanic rocks:					
Malpais	15	50			
(A-19-12½)13bad					
QUATERNARY:			Shale, red and blue	3	51
Alluvium:			Sandstone, red	6	57
Broken Kaibab, Coconino, and Moenkopi			PERMIAN:		
mixed; throwback from blowout	30	30	Kaibab Limestone:		
TRIASSIC:			Limestone, broken badly, Kaibab	281	338
Moenkopi Formation:			Coconino Sandstone:		
Shale, red and blue mottled, some gypsum	7	37	Sandstone, broken badly, Coconino, water		
streaks, Moenkopi			strata at 637-643 and 676-683	352	690
Limestone, sandy, red	11	48			
(A-19-13)5adc					
TRIASSIC:			Coconino Sandstone:		
Moenkopi Formation:			Sandstone, dark-yellow	30	280
Shale, red	10	10	Sandstone, light-yellow	120	400
Sandstone, red	30	40	Sandstone, buff-colored	50	450
PERMIAN:			Sandstone, light-gray, small amount of		
Kaibab Limestone:			water at 475 feet	100	550
Lime, yellow	160	200	Sandstone, white, more water	20	570
Lime, dark-yellow	50	250			
(A-19-13)29bab					
QUATERNARY:			Coconino Sandstone:		
Alluvium:			Sandstone, Coconino	38	230
Surface soil	1	1	Sandstone, yellow, Coconino, loses water	20	250
PERMIAN:			Sandstone, buff, hard	277	527
Kaibab Limestone:			Sandstone, white, Coconino, 4 gpm	6	533
Decomposed limestone, Kaibab	2	3	Sandstone, buff, Coconino	23	556
Limestone, buff, broken, Kaibab	29	32	Sandstone, white, Coconino, 12 gpm	12	568
Limestone, buff, solid, Kaibab	39	71	Sandstone, buff	35	603
Limestone, buff and white, Kaibab	121	192			
(A-19-14)4bbb					
QUATERNARY:			Limestone; hit crack and lost water at		
Alluvium:			290-295 feet	15	295
Sandy soil	10	10	Coconino Sandstone:		
TRIASSIC:			Sandstone, yellow, water	15	310
Moenkopi Formation:			Sandstone, light-yellow	60	370
Shale, red, Moenkopi	130	140	Sandstone, light-gray	100	470
PERMIAN:			Sandstone, light-gray and yellow	5	475
Kaibab Limestone:			Sandstone, light-gray, loose running sand		
Limestone, yellow	45	185	from 485-490 feet	20	495
Limestone, yellow and gray	95	280	Sandstone, light-gray	105	600
(A-20-7)28bcc					
QUATERNARY AND TERTIARY(?):			Toroweap Formation and Coconino Sandstone		
Alluvium:			undifferentiated:		
Topsoil	3	3	Sandstone, solid	320	725
Conglomerate	22	25	Sandstone, broken; lost previous water	30	755
Clay	40	65	Sandstone, solid	60	815
Sandstone	15	80	Sand shells; lost water through layer	25	840
Clay	65	145	Sandstone; water stands to 850 feet	105	945
PERMIAN:			Sandstone	35	980
Kaibab Limestone:			Sandstone, deep red	10	990
Limestone; 3 gpm at 275 in broken limestone	260	405			

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-20-7)30bbc					
QUATERNARY:			Sandstone, reddish-brown, Coconino	270	600
Alluvium:			Sandstone, reddish-brown, with streaks		
Soil and fill	20	20	of loose sand and rocks; water from		
PERMIAN:			823 to 720 feet	120	720
Kaibab Limestone:			Sandstone, reddish-brown, Coconino	305	1,025
Limestone, gray	60	80	Sandstone, reddish-brown, loose and		
Limestone, yellow	10	90	caving, Coconino	40	1,065
Limestone, light-yellow	30	120	PERMIAN AND PENNSYLVANIAN:		
Limestone, pink	10	130	Supai Formation:		
Limestone, gray and pink	120	250	Supai Formation, reddish and silty	10	1,075
Toroweap Formation and Coconino Sandstone					
undifferentiated:					
Sandstone, brown, Coconino	80	330			
(A-20-8)18bbb					
QUATERNARY:			Coconino	75	550
Alluvium:			Sand, brown, cracks	20	570
Clay, boulders	7	7	Sand, brown, Coconino	40	610
Volcanic rocks:			Sand, red, water showing; water raised		
Volcanic lava	104	111	to 582 feet	40	650
TERTIARY:			Coconino, cracks, sand trouble	55	705
Silt and sand:			Coconino, white; loose sand at 750 feet	75	780
Red clay and cinders	10	121	Sand, white, Coconino; loose sand	74	854
PERMIAN:			Coconino, pink	11	865
Kaibab Limestone:			Coconino, cracks	10	875
Lime, Kaibab	19	140	Coconino, lots of sand	125	1,000
Lime, very hard, some clay streaks	35	175	Sand, Coconino	75	1,075
Lime, soft, Kaibab	28	203	Coconino and clay	10	1,085
Lime, Kaibab	93	296	PERMIAN AND PENNSYLVANIAN:		
Kaibab	67	363	Supai Formation:		
Coconino Sandstone:			Clay, Coconino and Supai	52	1,137
Lime, sandstone, mixed	47	410	Clay, Supai	25	1,162
Lime, Coconino, very hard streaks	14	424	Clay, Supai; caving badly	12	1,174
Kaibab, Coconino, hard	51	475	Supai	113	1,287
(A-20-11)7ad					
QUATERNARY:			Coconino Sandstone:		
Alluvium:			Sandstone, buff, top Coconino	42	307
Surface soil	6	6	Sandstone, white	55	362
Lime boulders	1½	7½	Sandstone, buff	31	393
Shale, red, Moenkopi	1½	9	Sandstone, white	68	461
PERMIAN:			Sandstone, buff	209	670
Kaibab Limestone:			Sandstone, white	15	685
Limestone, buff, top Kaibab	39	48	Sandstone, buff	75	760
Limestone, gray	15	63	Sandstone, yellow	30	790
Limestone, buff	24	87	Sandstone, buff	101	891
Limestone, white	36	123	Sandstone, yields water, water rises to		
Limestone, buff, base Kaibab	142	265	852-foot level	59	950
(A-20-12)29ac					
PERMIAN:			Sandstone, buff	57	518
Kaibab Limestone:			Sandstone, yellow	11	529
Limestone, buff	63	63	Sandstone, white	38	567
Limestone, white	45	108	Sandstone, buff, water at 590 feet	45	612
Limestone, buff	188	296	Sandstone, white	4	616
Limestone, white	17	313	Sandstone, buff	37	653
Coconino Sandstone:			Sandstone, white	9	662
Sandstone, buff	63	376	Sandstone, buff	22	684
Sandstone, gray	85	461			
(A-21-5)2abc1					
QUATERNARY:			Malpais	53	68
Alluvium:			Clay, yellow	48	116
Soil	2	2	Malpais	6	122
TERTIARY:					
Volcanic rocks and silt:					
Malpais and caliche	13	15			

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-21-7)5aab					
QUATERNARY:			Clay and shale, red	7	70
Alluvium:			Lava, broken	5	75
Soil	5	5	Red clay and layers of lava	30	105
QUATERNARY AND TERTIARY(?):			Lava, medium-hard	15	120
Volcanic rocks and silt:					
Lava, solid	58	63			
(A-21-7)5aac					
QUATERNARY:			Lava, gray	3	45
Alluvium:			Lava, streaks of brown clay	12	57
Soil	2	2	Clay, red	9	66
QUATERNARY AND TERTIARY(?):			Layers of red clay	14	80
Volcanic rocks and silt:			Lava, medium-hard	27	107
Lava, hard	38	40	Lava with layers of red clay	23	130
Lava, broken	2	42			
(A-21-7)5acc					
QUATERNARY:			Cinders, silty clay with thin layers of		
Alluvium:			hard lava	5	50
Soil and cinders	10	10	Cinders and less lava	10	60
QUATERNARY AND TERTIARY(?):			Cinders and very hard lava	10	70
Volcanic rocks, silt, and sand:			Small cinders and clay with broken lava	20	90
Silty clay and cinders	10	20	Clay, red	15	105
Cinders, sandy; water at 27 feet	7	27	Lava, medium-hard	7	112
Cinders, silty clay with thin layers of			Clay, red	12	124
lava	18	45	Lava, hard	2	126
(A-21-7)5bab					
QUATERNARY:			Lava, broken	15	88
Alluvium:			Lava, solid	15	103
Soil	7	7	Lava, some water	8	111
QUATERNARY AND TERTIARY(?):			Red clay and cinders	8	119
Volcanic rocks, silt, sand, and gravel:			Lava, red, hard	8	127
Lava, boulders and fill	13	20	Red clay with layers of lava	27	154
Lava and cinders, water at 46 feet	39	59	Red clay and shale	16	170
Lava, hard	14	73			
(A-21-7)5dab					
QUATERNARY AND TERTIARY(?):			Lava, hard	36	63
Volcanic rocks and silt:			Lava, broken, medium-hard	46	109
Boulders and clay	22	22	Red clay and cinders	25	134
Cinders and clay	5	27	Red clay and some cinders	21	155
(A-21-7)21ccd					
TRIASSIC:			Coconino, yellow and white	595	1,105
Moenkopi Formation:			Clay, brown, with fine sand	20	1,125
Sandstone, Moenkopi	15	15	Coconino, yellow	20	1,145
PERMIAN:			PERMIAN AND PENNSYLVANIAN:		
Kaibab Limestone:			Supai Formation:		
Limestone, Kaibab	300	315	Shale with fine sand, light-brown, getting		
Toroweap Formation and Coconino Sandstone			darker	55	1,200
undifferentiated:					
Coconino, red, pink, thin streaks of yellow	195	510			
(A-21-7)26ab					
PERMIAN:			1½ gpm at 230 feet	294	294
Kaibab Limestone:			Toroweap Formation:		
Kaibab Limestone, white and cream, very			Sandstone, white, Coconino	3	297
hard, no cracks; ½ gpm at 73 feet and					

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-21-9)10bbc					
QUATERNARY:			PERMIAN:		
Volcanic rocks:			Kaibab Limestone:		
Boulders	10	10	Lime	284	382
Cinders	15	25	Coconino Sandstone:	454	836
Malpais, hard	47	72	Sand, Coconino	294	1,130
Malpais boulders	6	78	Supai, brown		
TRIASSIC(?):			PERMIAN AND PENNSYLVANIAN:		
Moenkopi(?) Formation:			Supai Formation:		
Moenkopi	20	98	Sandstone, red, hard	90	1,220
			Sandstone, red with soft streaks; hit water at 1,245 feet	118	1,338
(A-21-9)14ccb					
QUATERNARY:			Loose sand, sandstone	259	739
Alluvium:			Sandstone, cream, yellow, hard	201	940
Soil	1	1	Sandstone, light-brown, hard	133	1,073
Volcanic rocks:			PERMIAN AND PENNSYLVANIAN:		
Lava flows	127	128	Supai Formation:		
PERMIAN:			Sandstone, dark-brown, first water at 1,215 feet	142	1,215
Kaibab Limestone:			Sandstone, brown, red	100	1,315
Lime, Kaibab	192	320			
Coconino Sandstone:					
Coconino, white, cream	160	480			
(A-21-10)16bd					
QUATERNARY:			Coconino Sandstone:		
Alluvium:			Sandstone, yellow, Coconino	18	311
Cinders, boulders, clay	20	20	No record	9	320
PERMIAN:			Sandstone, white, hard, very broken at 320 feet	310	630
Kaibab Limestone:			Sandstone, yellow, very broken	40	670
Limestone, Kaibab	45	65	Sandstone, white, hard	110	780
Limestone, white, very hard	82	147	Sandstone, yellow, first water at 988 feet	238	1,018
No record	67	214	Sandstone, light-cream	32	1,050
Limestone, white, very broken at 214 feet	51	265			
Limestone, yellow	28	293			
(A-21-11)24d					
PERMIAN:			Underground cave opening	8	477
Kaibab Limestone:			Sand pocket, sand running in	13	490
Lime, white, very broken cracks and crevasse	100	100	Yellow, white streaks	10	500
Lime, white, very broken cracks, hard to keep hole straight	100	200	Sandstone, white	25	525
Lime, white to grayish, hard	55	255	Sandstone, yellow, soft	75	600
Coconino Sandstone:			Sandstone, yellow, soft, with sand pocket	27	627
Sandstone, medium-hard	45	300	Sandstone, soft, with sand pocket at 643 feet	48	675
Sandstone, yellow, soft	100	400	Sandstone, yellow, bearing water	63	738
Sandstone, yellow, soft	69	469			
(A-21-12)36bd					
PERMIAN:			Coconino Sandstone:		
Kaibab Limestone:			Sandstone, yellow	25	240
Limestone boulders	4	4	Sandstone, white	110	350
Limestone	16	20	Sandstone, yellow	130	480
Limestone	195	215	Sandstone, white	73	553
(A-21-13)22ad					
TRIASSIC:			Sandstone, yellow	45	80
Moenkopi Formation:			Limestone, buff	120	200
Surface soil and red shale	12	12	Coconino Sandstone:		
Limestone, red	8	20	Sandstone, buff	10	210
Shale, red	10	30	Sandstone, gray	10	220
PERMIAN:			Sandy shale, yellow	3	223
Kaibab Limestone:			Sandstone, white, water-bearing	6	229
Shale, yellow	5	35	Sandstone, yellow	24	253

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-22-2)27d					
QUATERNARY:			Granite	13	651
Alluvium:			Limestone	24	675
Sand and gravel	8	8	Limestone and shale	10	685
Boulders	8	12	Limestone	5	690
Clay and sand	28	40	Sandstone	5	695
QUATERNARY AND TERTIARY:			Sandstone, Coconino	8	703
Volcanic rocks:			Sandstone, white	13	716
Cinders	30	70	Shale, gray	7	723
Cinders, black	85	135	Coconino sandstone	20	743
Cinders, red	23	158	Sandstone	6	749
Lava rock	4	162	Shale, yellow	20	769
Malpais	18	180	Shale, hard	7	776
Cinders	18	198	Sandstone	24	800
Malpais	15	213	Sandstone, Coconino	5	805
Cinders	16	229	Sandstone, red	10	815
Malpais	32	261	Shale, gray	6	821
Cinders	15	278	Sandstone, gray	5	826
Malpais	39	315	Sandstone	14	840
Cinders	44	359	Sandstone, hard	1	841
Malpais	46	405	Sandstone, gray	5	846
Cinders	10	415	Sandstone	14	860
Malpais	60	475	Shale, red	2	862
Cinders	42	517	Sandstone	9	871
PERMIAN:			Sandstone, hard	9	880
Kaibab Limestone, Toroweap Formation, and			Sandstone	21	901
Coconino Sandstone undifferentiated:			Sandstone, white	11	912
Limestone, gray, clay	9	526	Sandstone and shale	32	944
Limestone	19	545	Shale, yellow	6	950
Clay and limestone	9	554	Sandstone	5	955
Clay and sandstone	8	560	Clay, yellow	7	962
Shale, red, and sandstone	24	584	Clay and sandstone	9	971
Sandstone, yellow	16	600	Clay, red	4	975
Shale, red, and sandstone	16	616	No record	9	984
Shale, gray	9	625	Sand, red, fine	16	1,000
Limestone, hard	13	638	Sand, red	20	1,020
(A-22-3)26bca					
QUATERNARY:			Lava	117	312
Alluvium:			Fine red cinders and ash; seep of water		
Topsoil	8	8	at 317 feet	5	317
QUATERNARY AND TERTIARY:			PERMIAN:		
Volcanic rocks:			Kaibab Limestone:		
Cinders, red, silty	84	92	Sandy lime, fine	1	318
Lava, black	4	96	Limestone, white, gray and reddish		
Lava, gray; some cracks at 126 to 128 feet	69	165	streaks; easy drilling	204	522
Cinders, red	30	195			
(A-22-4)26dc					
QUATERNARY:			Basalt	66	86
Alluvium:			Cinders, reddish	21	107
Clay	6	6	PERMIAN:		
TERTIARY:			Kaibab Limestone:		
Volcanic rocks:			Rock, gray, very hard	17	124
Basalt boulders	14	20			
(A-22-6)23bcb					
QUATERNARY:			Cinders, red	6	68
Alluvium:			Malpais, gray	31	99
Topsoil	2	2	Cinders, red	15	114
Dirt and cinders	29	31	Malpais, black, hard	18	132
QUATERNARY AND TERTIARY(?):			Cinders, black	15	147
Volcanic rocks:			Malpais, black, hard	17	164
Malpais, gray	31	62	Cinders, red	27	191

Table 3. --Modified drillers' logs of selected wells in southern Coconino County--Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-22-6)23dba					
QUATERNARY: Alluvium: Topsoil	12	12	TERTIARY AND TRIASSIC UNDIFFERENTIATED: Volcanic rocks and Moenkopi Formation undifferentiated: Cinders, red, and red and blue shale	24	212
QUATERNARY(?) AND TERTIARY: Volcanic rocks: Cinders	82	94	TRIASSIC: Moenkopi Formation: Red shale and sandstone	64	276
Malpais	33	127			
Cinders, red	21	148			
Malpais	40	188			
(A-22-6)23dca					
QUATERNARY: Alluvium: Clay, dark-brown	28	28	QUATERNARY AND TERTIARY(?): Volcanic rocks: Basalt flow, black, hard	19	97
Clay and boulders	15	43	Red cinders and boulders	6	103
Cinders and clay	22	65	Broken rock, cinders, red and black	11	114
Red cinders and boulders	13	78			
(A-22-6)25cac2					
QUATERNARY: Alluvium: Clay and boulders	20	20	Malpais, hard	4	114
QUATERNARY AND TERTIARY: Volcanic rocks, silt, sand, and gravel:			Clay, boulders, and cinders	41	155
Malpais, medium-hard	23	43	Clay, red	8	163
Boulders and cemented cinders	24	67	Malpais, hard	34	197
Malpais, hard, broken	12	79	Malpais, red	4	201
Broken red cinders and boulders, some clay	2	81	TRIASSIC: Moenkopi Formation: Shale, red, and Moenkopi	15	216
Malpais ledge; hole drifted some	6	87	Sandstone, red	15	231
Red clay and boulders and gravel	23	110	Shale, red	27	258
(A-22-6)25cbd					
QUATERNARY: Alluvium: Clay and boulders	39	39	Malpais, hard	60	115
QUATERNARY AND TERTIARY: Volcanic rocks and silt:			Brown cinders and clay	6	121
Malpais, basalt	8	47	Clay, brown	12	133
Broken malpais and cinders	8	55	Malpais, broken	33	166
			TRIASSIC: Moenkopi Formation: Shale, red, and Moenkopi	94	260
(A-22-6)26aaa					
QUATERNARY: Alluvium: Alluvium, water stratum at 75 feet, 20 gpm	75	75	TRIASSIC: Moenkopi Formation: Sandstone, Moenkopi, lost water in crevices	269	495
QUATERNARY AND TERTIARY: Volcanic rocks, silt, and gravel:			PERMIAN: Kaibab Limestone: Limestone, Kaibab; a little water at 724 feet, lost in crevice	249	744
Clay, red	9	84	Toroweap Formation and Coconino Sandstone undifferentiated:		
Volcanic cinders, brown	7	91	Sandstone, very red, soft	6	750
Clay, red	2	93	Sandstone, Coconino	271	1,021
Volcanic cinders, brown	30	123	Sand, white, Coconino	514	1,535
Lava flow	21	144	PERMIAN AND PENNSYLVANIAN: Supai Formation: Sand, red, Supai	5	1,540
Volcanic cinders, brown; water stratum from 144 to 146 feet, tested 20 gpm	23	167			
Lava flow	47	214			
Gravel or conglomerate	12	226			
(A-22-6)26daa					
QUATERNARY: Alluvium: Soil	5	5	Malpais boulders and clay	10	55
Clay, yellow, and gravel	10	15	Cinders and clay, some boulders	20	75
Clay, yellow, and boulders	10	25	Clay, tight, tested 15 gpm	15	90
Cinders and malpais boulders, some water at 25 feet	20	45	TERTIARY(?): Volcanic rocks: Malpais, hard	26	116
			Cinders	2	118

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-22-6)26daa—Continued					
Malpais	12	130	TRIASSIC:		
Malpais, broken, water, 2 gpm	35	165	Moenkopi Formation:		
Malpais, solid, more water at 195 feet	30	195	Moenkopi	17	227
Malpais boulders and cinders	15	210			
(A-22-7)32cbb					
QUATERNARY:			Boulders and cinders	20	165
Alluvium:			TRIASSIC:		
Topsoil	3	3	Moenkopi Formation:		
Boulders, sand, cinders	9	12	Sandstone, red	15	180
Gravel and cinders	133	145	Shale, red	22	202
(A-22-7)32dda					
QUATERNARY:			TRIASSIC:		
Alluvium:			Moenkopi Formation:		
Conglomerate	55	55	Moenkopi; first water at 100 feet	100	200
TERTIARY(?):					
Volcanic rocks:					
Malpais	45	100			
(A-22-7)33cca					
QUATERNARY AND TERTIARY:			Lava rock	10	90
Volcanic rocks, silt, and sand:			Red cinders and clay or ash	10	100
Sand, light-brown, and cinders	10	10	TRIASSIC:		
Cinders, brown	60	70	Moenkopi Formation:		
Cinders, black; water level 70 feet	10	80	Shale, red, Moenkopi	110	210
(A-22-7)34dc					
QUATERNARY:			TRIASSIC:		
Alluvium:			Moenkopi Formation:		
Brown sand, clay, and boulders	77	77	Red shale, clay, and sandstone; water	201	370
Granite boulder fill, gray	92	169			
(A-22-8)16dad					
QUATERNARY:			Lava and cinders	30	360
Alluvium:			PERMIAN:		
Sand, topsoil, and cinders	3	3	Kaibab Limestone:		
TERTIARY:			Limestone, Kaibab	55	415
Volcanic rocks:			Limestone, yellow	85	500
Sand and hard cinders	67	70	Limestone	110	610
Cinders, black, hard	20	90	Coconino Sandstone:		
Cinders, red	30	120	Sandstone, gray, Coconino	70	680
Lava, malpais, hard	10	130	Sandstone and shale	225	905
Lava, hard	10	140	Sandstone, caving	35	940
Lava, extremely hard	15	155	Sandstone, gray	70	1,010
Lava and cracks	15	170	Sandstone	140	1,150
Lava with loose caving layers	5	175	Sandstone, yellow	100	1,250
Lava, cinders, caving	30	205	Sandstone	160	1,410
Lava, caving	2	207	PERMIAN AND PENNSYLVANIAN:		
Lava, hard	40	247	Supai Formation:		
Lava	4	251	Sandstone, reddish-brown	140	1,550
Cinders	39	290	Shale and sandstone, red, Supai	55	1,605
Lava, vertical cracks	2	292	Sandstone and shale, Supai	50	1,655
Lava, black	8	300	Sandstone and shale, red	25	1,680
Lava	20	320	Sandstone, red	20	1,700
Lava, hard	10	330	Sandstone, Supai	55	1,755

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-22-8)33bda					
QUATERNARY:			Soil and loose rock	56	197
Alluvium:			Soft tuff or lava, small strip of gravel		
Soil, loose rock, little clay	29	29	at 217 feet	96	293
Boulders	5	34	PERMIAN:		
Soil and loose rock	84	118	Kaibab Limestone:		
Sandstone, red	23	141	Limestone, Kaibab	117	410
(A-22-9)29bac					
QUATERNARY:			Coconino Sandstone:		
Volcanic rocks, silt, and sand:			No record	130	605
Cinders	40	40	Coconino, very broken	440	1,045
Clay-cinder mix	18	58	PERMIAN AND PENNSYLVANIAN:		
Malpais, very hard	26	84	Coconino Sandstone and Supai Formation		
Malpais, red, soft	46	130	undifferentiated:		
Cinders, clay, sand	50	180	Supai, pink, red	405	1,450
PERMIAN:					
Kaibab Limestone:					
Lime, Kaibab, no cracks	295	475			
(A-22-11)35bc					
QUATERNARY:			Sandstone, white	100	400
Volcanic rocks:			Sandstone, white, cutting good, wearing		
Malpais boulders, black	24	24	cable	100	500
Boulders, red, a form of malpais	6	30	Sandstone, white	200	700
PERMIAN:			Sandstone, white, water	33	733
Kaibab Limestone:			Sandstone, water-bearing, 610 feet		
Lime, white	70	100	water sand	107	840
Lime, white, no cracks	100	200	Sandstone, yellow, bearing water,		
Lime, yellow, base of Kaibab 240 feet	40	240	tested 10 gpm	10	850
PERMIAN AND PENNSYLVANIAN:			Sandstone, yellow, no water	155	1,005
Coconino Sandstone and Supai Formation			No record	156	1,161
undifferentiated:					
Sandstone	60	300			
(A-23-8)16dcd1					
QUATERNARY:			Lava flow, black, hard	36	129
Volcanic rocks, silt, sand, and gravel:			Gravel, sand, boulders, and clay	361	490
Soil	2	2	Lava flow, black, hard	34	524
Cinders, brown	11	13	Flow, black, red, broken	12	536
Silt, fine	8	21	Lava flow, black, hard	16	552
Cinders, black	54	75	Red burned clay, sand	21	573
Cinders, black; large boulders	18	93	Brown clay, sand, and gravel	31	604
(A-23-11)28a					
QUATERNARY:			Lime, red	82	350
Volcanic rocks:			Coconino Sandstone:		
Cinders	58	58	Sand rock	295	645
Lava	47	105	Water sand, water	20	665
PERMIAN:			Sand, pink	92	757
Kaibab Limestone:					
Lime, gray	163	268			
(A-24-1)16deb					
QUATERNARY:			Toroweap Formation:		
Alluvium:			Clay and shale, red	60	390
Boulders and clay	20	20	Limestone	5	395
PERMIAN:					
Kaibab Limestone:					
Limestone, hit water at 330 feet	310	330			

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-24-1)28ccd					
QUATERNARY:			Coconino Sandstone:		
Alluvium:			Sandstone, Coconino	55	595
Boulders and soil fill	20	20	Coconino	20	615
PERMIAN:			Coconino, brown	15	630
Kaibab Limestone:			Coconino, white	40	670
Lime, Kaibab, very broken	45	65	Coconino, white, caving	40	710
Lime, Kaibab, very hard	30	95	Coconino, cream-colored	40	750
Lime, Kaibab, hard	75	170	Coconino, white	50	800
Lime, Kaibab, bad cracks	35	205	Coconino, pink	43	843
Lime, Kaibab, very broken and hard	40	245	Sandstone, light-brown, very hard	97	940
Lime, Kaibab, soft	60	305	PERMIAN AND PENNSYLVANIAN:		
Toroweap Formation:			Supai Formation:		
Sandy shale, red	15	320	Sandstone, light-red	45	985
Sandy shale, red; thin layer of sandstone	100	420	Sandstone, red, Supai	45	1,030
Limestone, Kaibab	75	495	Supai, red, broken; losing drilling water	40	1,070
Shale, red; thin layer of sandstone	15	510	Sandstone, red, Supai	40	1,110
Limestone, dark-red, Kaibab	30	540	Shale and sandstone, red	30	1,140
(A-24-5)11cac					
QUATERNARY:			No cuttings, hard and broken	15	117
Alluvium:			Malpais, black, hard	6	123
Clay and boulders	3	3	Malpais, red; layers of red boulders and cinders	52	175
TERTIARY:			Cinders and boulders, red, black, brown, cavey	22	197
Volcanic rocks and sand:			Malpais, black, hard	73	270
Cinders and boulders	34	37	Boulders, cinders, red, cavey	6	276
Malpais, black, hard	31	68	Malpais, black, hard	59	335
Malpais, black, broken, very hard, lost water	25	93	Sand, brown, fine	11	346
Malpais, black, very hard, lost water	9	102			
(A-24-5)11cdb					
QUATERNARY:			Boulders and cinders, black and red, loose	15	105
Alluvium:			Malpais, red	10	115
Soil	6	6	Cinders, red and black	30	145
TERTIARY:			Malpais, black, hard	30	175
Volcanic rocks:			Malpais boulders and cinders, black	30	205
Lava cinders	24	30	Malpais, black	75	280
Malpais, black, hard	60	90	Cinders, red	12	292
(A-25-1)22bd					
QUATERNARY AND TERTIARY(?):			Rock, red	25	80
Alluvium:			Mud rock, red; water	10	90
Soil and gravel	25	25	Rock, brown, hard	10	100
Shale, red	10	35	Rock, red; broke through in water at 105 feet, unable to bail dry	9	109
Shale, light-brown, hard	5	40			
Rock, yellow	15	55			
(A-25-5)27ccb					
QUATERNARY AND TERTIARY:			Conglomerate fill, yellow and red	80	265
Volcanic rocks and gravel:			Malpais, hard, broken	38	303
No record	116	116	PERMIAN:		
Malpais, broken, and cinders	5	121	Kaibab Limestone:		
Malpais, black, hard	64	185	Limestone, red and white, Kaibab	17	320
(A-25-6)20baa					
QUATERNARY:			TRIASSIC:		
Alluvium:			Chinle Formation:		
Malpais boulders, sand, and clay	55	55	Petrified Forest Member:		
			Chinle, red	5	60

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-25-6)20bbb					
QUATERNARY: Alluvium: Malpais boulders	35	35	115 feet	35	115
TRIASSIC: Chinle Formation: Petrified Forest Member: Chinle, gray and white; $\frac{1}{2}$ gpm at 80 feet	45	80	TRIASSIC: Moenkopi Formation: Sandstone and shale, Moenkopi	319	434
Shinarump Member: Shinarump, gray and white; 1 gpm at			PERMIAN: Kaibab Limestone: Limestone, Kaibab; water stands 30 feet from bottom, 15 gpm	3	437
(A-25-6)20bdd					
QUATERNARY: Alluvium: Boulders and soil	6	6	TRIASSIC: Chinle Formation: Petrified Forest Member: Shale, red	30	142
TERTIARY: Volcanic rocks: Malpais; water from 92 to 112 feet	106	112			
(A-25-9)6cca					
QUATERNARY: Alluvium: Cinders, red	49	49	Lime, yellow	40	305
PERMIAN: Kaibab Limestone: Lime, yellow	21	70	Coconino Sandstone: Sandstone, buff or reddish-yellow	185	490
Lime, crack	65	135	Sandstone, yellow	785	1,275
Lime, light-brown	45	180	PERMIAN AND PENNSYLVANIAN: Supai Formation: Sandstone, red	75	1,350
Lime, light-yellow	45	225	Sandstone, buff	30	1,380
Lime, white	40	265	Sandstone, red	178	1,558
			Sandstone, yellow; water at 1,670 feet	242	1,800
(A-26-8)1b					
TRIASSIC: Moenkopi Formation: Shale, red, Moenkopi	100	100	Sandstone, gray	320	660
PERMIAN: Kaibab Limestone: Limestone, gray	230	330	Sandstone, yellow	160	820
Coconino Sandstone: Sandstone, red	10	340	Sandstone, grayish-blue	100	920
			PERMIAN AND PENNSYLVANIAN: Coconino Sandstone and Supai Formation undifferentiated: Sandstone, red	630	1,550
(A-26-9)15ac					
PERMIAN: Kaibab Limestone: Limestone, white	200	200	Sandstone, light-yellow, hard	102	1,150
Sandy limestone, red	42	242	PERMIAN AND PENNSYLVANIAN: Supai Formation: Sandstone, pink, hard; small show of water at 1,152 feet, 4 gpm at 1,200 feet	50	1,200
Coconino Sandstone: Sandstone, white, hard	206	448	Sandstone, yellow and pink; 18 gpm at 1,250 feet	50	1,250
Sandstone, buff, hard	164	612			
Sandstone, pink, soft	436	1,048			
(A-26-9)33dac					
QUATERNARY: Alluvium: Boulders and caliche	10	10	Coconino Sandstone: Sandstone, white, very hard	220	530
TERTIARY: Volcanic rocks: Malpais	60	70	Sandstone, yellow, medium-hard	170	700
PERMIAN: Kaibab Limestone: Limestone, blue, very hard	50	120	Sandstone, red, medium-hard	200	900
Limestone, yellow	10	130	Sandstone, white, very hard	90	990
Limestone, white	180	310	Sandstone, yellow, very hard	240	1,230
			PERMIAN AND PENNSYLVANIAN: Supai Formation: Shale, red, sandy	20	1,250
			Sandstone, red	190	1,440

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-27-1)29c					
PERMIAN:			Sandstone, light with red specks	85	785
Kaibab Limestone:			Sandstone, red and light-colored	33	818
Rock and sandstone, broken	10	10	Sandstone, light	134	952
Rock, yellow	20	30	Sandstone, red	193	1,145
Lime, cream-colored	15	45	Sandstone, light	30	1,175
Sandstone, yellow	30	75	Sandy shale, yellow	10	1,185
Rock, yellow	15	90	Sandstone, yellow	55	1,240
Rock, brown	13	103	Sandstone, light	39	1,279
Lime, cream-colored	24	127	PERMIAN AND PENNSYLVANIAN:		
Lime, light	9	136	Hermit Shale and Supai Formation		
Sandstone, white	34	170	undifferentiated:		
Lime, cream-colored	77	247	Shale, dark-red; water seep, 2½ gallons		
Sandstone, brown, and white lime	43	290	per hour	3	1,282
Rock, dark, hard	30	320	Shale, red, hard	25	1,307
Lime, light-colored	90	410	Sandstone, light	8	1,315
Toroweap Formation:			Shale, red	5	1,320
Shale, red	60	470	Sandstone, light, hard	5	1,325
Sandstone, yellow	15	485	Shale, dark-red	35	1,360
Sandy shale, red	20	505	Sandstone, light, hard	10	1,370
Shale, light-brown	15	520	Sandstone, light; red shale; specks of		
Shale, red	10	530	blue shale	10	1,380
Rock, light-brown	20	550	Shale, dark-red	15	1,395
Lime, cream-colored	35	585	Shale, light-red	4	1,399
Rock, dark, and yellow shale	50	635	Sandstone, light	7	1,406
Shale, yellow, and light-colored lime	30	665	Shale, dark-red	4	1,410
Coconino Sandstone:			Sandstone, light	30	1,440
Sandstone, light-colored	35	700	Sandstone, reddish	30	1,470
(A-28-9)35bac					
TRIASSIC:			Sandy shale	15	435
Chinle Formation:			Shale, red	65	500
Shinarump Member:			Sandy shale, red	20	520
Shale, red	40	40	PERMIAN:		
Sandstone	15	55	Kaibab Limestone:		
Shale, red	15	70	Lime rock	220	740
Sandstone, seep of water, not enough for			Crevasse	5	745
drilling	12	82	Lime and sandstone	40	785
Moenkopi Formation:			Sandstone, poorly cemented and some		
Shale, red	338	420	runs	43	828
(A-29-1)29b					
QUATERNARY AND TERTIARY(?):			Lime, light-yellow, medium-hard	30	370
Alluvium:			Lime, blue, very hard	32	402
Soil	4	4	Lime, white, medium-hard	56	458
Clay	6	10	Lime, gray, medium-hard	16	474
Gravel and clay	12	22	Lime, blue, medium-hard	6	480
Clay, red	15	37	Lime, white, medium-hard	10	490
Gravel, clay	18	55	Lime, light-blue, very hard	14	504
Clay	10	65	Toroweap Formation:		
TRIASSIC:			Lime, light-red, soft, Toroweap	126	630
Moenkopi Formation:			Lime, buff, soft	20	650
Shale, red, hard, Moenkopi	15	80	Lime, white, soft	20	670
Sandstone, red, hard	8	88	Lime, pink, soft	72	742
Shale, red	2	90	Coconino Sandstone:		
Sandstone, red	5	95	Sandstone, light-red, Coconino	83	825
Shale, red	7	102	Sandstone, white and pink	15	840
PERMIAN:			Sandstone, pink	100	940
Kaibab Limestone:			Sandstone, light-red	30	970
Lime, Kaibab	3	105	Sandstone, white	120	1,090
Lime, white, medium-hard	85	190	Sandstone, pink and red	122	1,212
Lime, yellow, medium-hard	30	220	PERMIAN AND PENNSYLVANIAN:		
Lime, white, medium-hard	65	285	Hermit Shale and Supai Formation		
Lime, blue, very hard	40	325	undifferentiated:		
Lime, yellow, medium-hard	15	340	Shale and sandstone, red, Supai	63	1,275

Table 3. --Modified drillers' logs of selected wells in southern Coconino County--Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-29-1)29dc					
QUATERNARY:			Toroweap Formation:		
Alluvium:			Shale, red, sandy	130	490
Topsoil	6	6	Shale, blue, sandy	30	520
Clay and sand	9	15	Lime, pink	50	570
Sand and gravel	5	20	Shale, brilliant-red, sandy	10	580
PERMIAN:			Coconino Sandstone:		
Kaibab Limestone:			Sandstone, orange	110	690
Lime, gray	10	30	Sandstone, pink and orange	90	780
Lime, yellow	10	40	Sandstone, gray	30	810
Lime, gray	30	70	Sandstone, gray and yellow	130	940
Lime, gray, hard	10	80	Sandstone, white	47	987
Lime, white	30	110	PERMIAN AND PENNSYLVANIAN:		
Lime, yellow	70	180	Hermit Shale and Supai Formation		
Lime, gray	50	230	undifferentiated:		
Lime, yellow	70	300	Stone, pink and red, layers of red shale;		
Lime, gray, hard	40	340	hit water at 1,020, $\frac{1}{2}$ gpm	143	1,130
Lime, blue	20	360			
(A-30-2)17					
QUATERNARY:			Silica	9	369
Alluvium:			Limestone	131	500
Surface soil and silica	22	22	Coconino Sandstone:		
PERMIAN:			Sandstone	64	564
Kaibab Limestone:			Sandstone, red	61	625
Limestone	45	67	Sandstone, red and yellow	50	675
Silica, soft	11	78	Sandstone, light-pink and yellow	25	700
Limestone	35	113	No record	19	719
Limestone and silica, hard	4	117	Limestone, yellow	40	759
Limestone	86	203	Sandstone, yellow	136	895
Toroweap Formation:			Hermit Shale:		
Limestone, red	122	325	Shale, red	5	900
Limestone	35	360	Shale, red, hard	100	1,000
(A-30-2)24bbb					
QUATERNARY:			Toroweap Formation:		
Alluvium:			Clay, red	90	485
Soil	25	25	Sandy clay	10	495
Broken rock	3	28	Lime, hard, show of water at 530 feet	75	570
Soil and clay	12	40	Lime, yellow	50	620
PERMIAN:			Clay, red	35	655
Kaibab Limestone:			Sandy clay, red	5	660
Lime, Kaibab	79	119	Coconino Sandstone:		
Lime, real hard	5	124	Coconino, yellow	20	680
Lime, yellow	71	195	Coconino, pink, showing of clay	15	695
Lime, gray, hard	50	245	Coconino, gray	15	710
Lime, hard, some cracks	150	395	Coconino, white	20	730
(A-30-2)25b					
PERMIAN:			Toroweap Formation:		
Kaibab Limestone:			Sandy limestone, red, soft	37	385
Limestone, yellow	15	15	Sandy limestone, light-red, hard	19	404
Limestone, yellowish-red, sandy	15	30	Sandy limestone, light-red, soft	36	440
Limestone, dark-yellow	20	50	Limestone, yellow, soft	18	458
Limestone, white, hard	8	58	Sandy limestone, light-red, soft	12	470
Lime, white, hard, very fractured,			Limestone, buff, very hard	10	480
crevices	14	72	Limestone, buff, medium-hard	20	500
Limestone, white, hard	14	86	Limestone, light-yellow, very hard	30	530
Limestone, light-yellow, hard, more			Limestone, buff, medium-hard	20	550
crevices	16	102	Sandy limestone, light-red, soft	20	570
Limestone, dark-yellow, hard	20	122	Sandy limestone, red, soft	20	590
Limestone, light-yellow, hard, more			Sandy limestone, buff	18	608
crevices	53	175	Coconino Sandstone:		
Limestone, light-yellow, medium-hard	80	255	Sandstone, light-yellow, hard	22	630
Limestone, light-yellow, very hard	93	348			

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(A-30-2)25c					
PERMIAN:			Coconino Sandstone:		
Kaibab Limestone:			Sandstone, buff-colored	294	930
Lime, light-yellow	362	362	Sandstone, white	35	965
Toroweap Formation:			Sandstone, pink	10	975
Sandy lime, red	134	496	Sandstone, white	10	985
Sandstone, red	9	505	Sandstone, buff-colored	111	1,096
Lime, gray	18	523	PERMIAN AND PENNSYLVANIAN:		
Lime, light-gray, 2½ gpm	61	584	Hermit Shale and Supai Formation		
Lime, light-red	14	598	undifferentiated:		
Lime, light-gray	32	630	Shale, red	224	1,320
Lime, light-red	6	636	Sandstone and shale, red	80	1,400
(B-24-8)17dc1					
QUATERNARY:			CAMBRIAN:		
Alluvium:			Muav Limestone and Bright Angel Shale		
Adobe and gravel	70	70	undifferentiated:		
MISSISSIPPIAN AND DEVONIAN			Shale and limestone	25	780
UNDIFFERENTIATED:			Limestone	205	985
Redwall Limestone and Martin Limestone			Shale, blue	35	1,020
undifferentiated:			Limestone	60	1,080
Limestone	184	254	Shale	45	1,125
Quartzite	20	274	Limestone	65	1,190
Porphyry	11	285	Shale, blue	155	1,345
Quartzite	5	290	Tapeats Sandstone:		
Limestone	465	755	Sandstone, gray	15	1,360
			Sandstone, red	355	1,715
			PRECAMBRIAN:		
			Rock, gray, soft granite	73	1,788
(B-25-3)3cc					
QUATERNARY:			Malpais, black, hard	8	81
Alluvium:			Cinders, black	2	83
Soil	2	2	Malpais, black, hard	16	99
Boulders and cinders	9	11	TERTIARY:		
Volcanic rocks:			Silt:		
Malpais, hard, broken; lost water	53	64	Shale and clay, red	41	140
Red cinders and clay	9	73			
(B-25-10)10adc					
QUATERNARY:			MISSISSIPPIAN:		
Alluvium:			Redwall Limestone:		
Topsoil	4	4	Limestone, very hard	61	82
Cemented conglomerate	17	21			
(B-26-3)19b					
QUATERNARY:			Shale and clay, red	21	158
Alluvium:			Red shale, clay, and sand; seep at 186 feet	29	187
Soil	2	2	Shale, red, hard	18	205
Volcanic rocks:			Sandy shale, brown	9	214
Malpais, soft	49	51	Sand, gray	8	222
Malpais, hard	52	103	Shale, brown	69	291
TERTIARY:			Sandstone, brown	32	323
Silt, sand, and gravel:			Sandy lime, light	11	334
Conglomerate, red sand, and clay; seep			Sandy conglomerate, red	16	350
at 122 feet	34	137	Lime and boulders	4	354
(B-28-3)12					
QUATERNARY AND TERTIARY(?):			Limestone, pink	20	140
Alluvium:			Limestone, white, hard	10	150
Shale, white, yellowish	10	10	Limestone, buff, hard	12	162
Shale, red	10	20	Limestone, white, hard	18	180
Sandy gravel and shale, red	30	50	Limestone, buff, soft	40	220
PERMIAN:			Limestone, white, hard	10	230
Kaibab Limestone:			Toroweap Formation:		
Sandy limestone, reddish-gray	13	63	Limestone, light-red, soft	22	252
Sandy limestone, buff	57	120	Limestone, buff, soft	38	290

Table 3. --Modified drillers' logs of selected wells in southern Coconino County—Continued

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
(B-28-3)12—Continued					
Limestone, light-red, soft	10	300	Sandy shale, red and pink	70	590
Limestone, white, very hard	60	360	Limestone, red, gray, and green	110	700
Limestone, light-yellow, hard	22	382	Coconino Sandstone:		
Limestone, light-red, hard	13	395	Sandstone, pink, red, and white; seep at		
Limestone, light-buff, hard	45	440	1,140 feet	440	1,140
Limestone, dark-buff, hard	12	452	Hermit Shale:		
Limestone, white, soft	8	460	Sandy shale, hard	180	1,320
Limestone, pink and white, hard	11	471	Shale, red, hard	80	1,400
Limestone, red and pink, hard	49	520			
(B-28-7)31c					
QUATERNARY AND TERTIARY(?):			Sand and gravel, gravel as much as		
UNDIFFERENTIATED:			6 inches in diameter	13	19
Alluvium:			Silty conglomerate, some clay	18	37
Topsoil	6	6	Sand and gravel, cemented	92	129
			Sandy clay and gravel	21	150
(B-29-1)12dbd					
QUATERNARY:			Lime, cream and white, very broken	105	610
Alluvium:			Coconino Sandstone:		
Soil, gravel, and sand	10	10	Sandstone, cream, white, pink, very hard,		
PERMIAN:			broken; first water at 990 feet, $\frac{1}{2}$ gpm	445	1,055
Kaibab Limestone:			Hermit Shale:		
Lime, white and cream, very hard	370	380	Sandstone, pink, with thin layers of red	17	1,072
Toroweap Formation:			shale	8	1,080
Shale and sandstone, red and brown	125	505	Shale, dark-red		
(B-30-1)28aaa1					
QUATERNARY:			Shale, red	2	326
Alluvium:			Limestone, white, hard	4	330
Surface soil	10	10	Shale, red	5	335
Sand and gravel	5	15	Limestone, white	10	345
PERMIAN:			Sandy limestone	30	375
Kaibab Limestone:			Shale, red	3	378
Sandstone, yellow	10	25	Sand, limestone, and shale	7	385
Sandy limestone, hard	10	35	Shale, red	3	388
Shale and sand, yellow	5	40	Sandy lime and shale	7	395
Sandy limestone, white, hard	35	75	Red shale and sand	20	415
Sandy limestone, yellow	5	80	Limestone, black	5	420
Limestone, white, hard	40	120	Red shale and sand	25	445
Sandy limestone	30	150	Sandstone, yellow	10	455
Limestone, white, hard	40	190	Red shale and sand	5	460
Sandy limestone, hard	15	205	Sandstone, yellow	80	540
Sandy limestone, brown	35	240	Sandy shale, gray	15	555
Limestone, white	57	297	Coconino Sandstone:		
Limestone, brown	13	310	Sandstone, yellow	60	615
Limestone, white, hard	2	312	Sandstone, white, hard	220	835
Toroweap Formation:			Sandstone, light-brown; hit water at		
Shale, red	2	314	925 feet, rose to 900 feet	155	990
Limestone, white, hard	10	324			
(B-30-1)28baa					
PERMIAN:			Sandstone, bluish-black	22	567
Kaibab Limestone:			Coconino Sandstone:		
Limestone, yellowish, hard	222	222	Sandstone, yellowish-brown	53	620
Sandstone, fairly soft	33	255	Sandstone, white, fine; hit water at		
Limestone, hard	110	365	905 feet	410	1,030
Toroweap Formation:			Hermit Shale:		
Sandstone, reddish-brown	120	485	Shale, Hermit	21	1,051
Sandstone, yellowish-brown	60	545			

Table 4. --Chemical analyses of water from selected wells and springs in southern Coconino County

[Analyses by U.S. Geological Survey, except as indicated. Analyses in milligrams per liter, except as indicated. Dissolved solids: Sum of determined constituents, except as indicated. Remarks: CT, sample obtained from closed storage tank at well; OT, sample obtained from open storage tank at well; ASHL, analysis by Arizona State Health Laboratory; ATL, analysis by Arizona Testing Laboratories; GSL, analysis by Bureau of Indian Affairs, Gallup Soils Laboratory; stratigraphic names indicate water-bearing strata]

Well or spring location	Date of collection	Temperature (°C)	Silica (SiO ₂)	Iron (Fe), in solution at time of analysis	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Remarks
																Calcium, magnesium	Non-carbonate			
(A-11-14)22cbd	8-9-66	11	10	0.18	14	4.1	2.5	66	0	1.0	2.0	0	0	0	66	52	0	107	7.3	Coconino Sandstone and Supai (?) Formation.
(A-12-7)14	2-16-52	21	14	0	104	40	6.9	485	0	27	9	0	0	0	440	424	0	753	7.3	Fossil Springs; Naco Formation.
(A-12-12)33bac	10-17-52	9	8.7	0	26	7.6	0	111	0	3.1	2	0	0	0	104	96	0	174	7.3	Tonto Spring; Supai Formation.
(A-13-7)14bab	9-22-66	0	44	0	32	18	17	180	0	12	22	0	0	0	234	154	6	350	7.6	CT; volcanic rocks, sand, and gravel.
(A-13-13)1ddb	5-15-52	8	9.4	0	62	34	5.1	346	0	12	6	0	0	0	299	294	11	540	7.3	Coconino Sandstone.
(A-14-8)32aa	5-28-59	16	20	0	51	22	5.5	268	0	1.6	6.0	0	0	0	239	218	0	401	8.0	Buckhorn Spring; Coconino Sandstone.
(A-14-11)9dca	7-20-66	0	12	0	78	43	5.3	446	0	5.0	8.0	0	0	0	371	370	4	649	7.4	CT; Coconino Sandstone.
12bcd	7-5-46	14	0	0	70	32	4.4	365	0	5.8	5	0	0	0	301	306	7	549	7.3	Do.
30ddd	10-26-65	13	0	0	74	26	4.8	358	0	0	6.5	0	0	0	0	292	0	532	7.7	Coconino Sandstone.
(A-15-7)14acc	10-19-59	16	23	0	29	10	4.8	147	0	0	2.5	0	0	0	143	115	0	236	7.4	Wet Beaver Creek Springs; Coconino Sandstone.
(A-15-11)5bdc	6-22-66	0	15	0	57	28	4.8	294	0	18	6.5	0	0	0	274	258	17	475	7.5	CT; Coconino Sandstone.
(A-15-12)4ecc	11-2-66	13	11	0	70	28	11	302	0	66	8.0	0	0	0	343	304	56	573	7.2	Coconino Sandstone.
15ddc	6-17-66	13	12	0	66	33	2.8	330	0	26	6.0	0	0	0	308	300	30	532	7.5	Do.
(A-15-13)18cba	8-3-66	0	11	0	57	29	3.0	296	0	18	4.0	0	0	0	268	260	18	467	7.5	Do.
(A-15-14)3bbb	5-5-66	0	0	0	66	34	3.7	289	0	65	6.5	0	0	0	317	306	69	580	7.9	CT; Coconino Sandstone.
(A-15-15)4bdc	5-5-66	0	0	0	46	23	3.2	234	0	17	4.0	0	0	0	208	208	16	384	7.7	Coconino Sandstone.
12bbc	11-22-66	16	13	0	48	21	8.3	244	0	18	5.0	0	0	0	234	208	8	401	7.7	Do.
(A-16-5)24acc	8-7-64	0	0	0	23	12	9	0	0	6	4	0	0	0	156	108	0	0	7.3	ASHL; Supai Formation.
(A-16-6)8ecd	5-23-57	17	17	0	47	20	5.5	233	0	6.2	9.0	0	0	0	221	200	0	422	7.3	Supai Formation.
(A-16-9)28cbc	9-22-66	0	36	0	46	22	14	262	0	9.0	8.0	0	0	0	264	206	0	416	7.4	CT; volcanic rocks and silt.
(A-16-11)13bca	11-9-33	0	0	0	80	31	13	316	0	41	37	0	0	0	358	327	0	0	7.3	Alluvium.
(A-16-12)9bbb	11-10-33	0	0	1.20	12	48	0	0	0	26	6	0	0	0	205	227	0	0	7.3	CT; Coconino Sandstone.
5-11-66	5-11-66	0	17	0	54	28	3.4	268	0	28	6.0	0	0	0	269	250	30	459	7.5	Coconino Sandstone.

See footnote at end of table.

Table 4. --Chemical analyses of water from selected wells and springs in southern Coconino County --Continued

Well or spring location	Date of collection	Tem-perature (°C)	Silica (SiO ₂)	Iron (Fe), in solu-tion at time of analysis	Calcium (Ca)	Magne-sium (Mg)	Sodium (Na)	Potas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Dis-solved solids	Hardness as CaCO ₃		Specific conduct-ance (micro-mhos at 25°C)	pH	Remarks
																Calcium, magne-sium	Non-car-bonate			
(A-16-13)19aaa	7-5-46 5-29-66	14	 13	 0.01	43 44	22 22	2.8 3.9	221 228	0 0	0 0	18 14	2 5.0	 0.1	2.1	199 214	198 200	17 13	367 382	 7.3	Coconino Sandstone. Do.
(A-16-14)3bba	11-21-33 5-3-66	 17	..... .....	..... .....	74 72	35 35	4.2 6.9	262 268	0 0	0 0	104 99	10 10	0 .2	.9	357 355	328 322	 103	 608	 7.7	Do. Do.
(A-16-15)17abc	1-29-34 7-29-66	..... .....	..... 14	 0	85 46	38 39	27 28	248 144	0 0	0 0	168 158	34 38	.3 0	.6	475 394	368 274	 156	 640	 7.4	Do. OT; Coconino Sandstone.
(A-17-3)5db	10-10-51	19	15	.....	72	27	5.8	341	.....	.....	7.6	10	.2	1.5	307	290	.....	543	.....	Summers Spring; Redwall Limestone.
(A-17-5)3dbd	5-21-57	17	12	.....	54	24	29	277	.....	.....	10	42	.2	.3	308	233	.....	526	7.3	Supai Formation.
25aab	2-11-60	.....	.....	.....	50	20	7	.....	.....	.....	6	1	.1	.....	a/217	208	.....	.....	.....	ASHL; Supai Formation.
(A-17-6)8db	5-8-62	.....	.....	.....	37	16	5	.....	.....	.....	< 1	4	.1	1	a/170	160	.....	.....	.....	Do.
18add1	1-19-62 1-16-67	..... .....	..... 20	< .05 0	48 50	20 21	6 8.5	 262	 0	 0	< 1 8.0	4 5.0	.1 .2	2	a/213 242	204 212	 0	 410	 7.4	Do. Supai Formation.
30bc	5-22-57	16	17	.02	38	19	10	226	0	0	4.1	3.5	.2	.5	203	173	0	343	7.1	CT; Supai Formation.
(A-17-13)2baa	5-11-66	14	13	0	75	36	10	252	0	0	128	12	.1	.....	398	334	128	626	7.7	Coconino Sandstone.
(A-17-14)17add	5-3-66	17	.....	.....	78	34	8.7	259	0	0	123	9.0	.1	.....	381	334	122	633	7.5	Do.
23bcd	11-21-33	.....	.....	.....	78	36	7.7	254	0	0	123	16	0	.7	386	343	.....	.....	.....	Do.
(A-18-4)25ccb	10-10-58	17	12	.....	78	38	4.8	398	.....	.....	2.5	18	1.6	4.3	355	351	.....	665	7.5	Redwall Limestone and Supai(?) Formation.
(A-18-5)27abb	10-10-58	.....	12	.....	71	30	58	302	.....	.....	16	114	.2	.5	451	300	.....	829	7.5	Do.
(A-18-7)15ecb2 ...	7-23-65	10	.....	.....	25	9.4	6.2	128	0	0	4	4	< .2	...	.....	101	0	214	7.9	Alluvium.
15ecc	5-18-66	.....	31	0	54	0	46	154	0	0	95	8	.1	.....	388	136	.....	.....	7.8	ATL; alluvium.
27cbb	9-7-65	17	.....	.....	17	7.7	12	100	0	0	6	8.0	< .2	.....	.....	74	0	197	7.2	Supai Formation.
(A-18-12)35dda	5-12-66	.....	15	.01	80	34	15	240	0	0	154	9.0	.3	.....	425	338	142	637	7.4	Coconino Sandstone.
(A-18-13)13ecd	11-20-33 5-11-66	 17	 15	 0	66 76	41 36	14 16	232 254	 0	 0	136 126	21 23	0 .1	2.1	394 417	333 336	 128	 655	 7.6	Do. Do.
(A-18-14)3abd1	5-4-66	18	.....	.....	80	42	247	262	0	0	132	395	.1	.....	1,020	372	158	1,870	7.6	Do.
13abd2 ...	8-25-53	..	19	.....	60	34	79	264	0	0	110	92	0	.....	531	289	.....	.....	7.5	ATL; Coconino Sandstone.
11-17-59	11-17-59	.....	11	.....	90	39	254	256	0	0	110	432	.4	.....	1,060	386	.....	.....	7.2	Do.
10-25-65	10-25-65	.....	7	.....	98	.....	389	251	0	0	325	390	.4	.....	1,340	360	.....	.....	7.5	Do.
3-3-66	3-3-66	.....	.....	.....	82	44	249	258	0	0	130	410	.2	.....	1,040	384	.....	1,850	7.5	Coconino Sandstone.
1-8-55	1-8-55	.....	6.8	.....	70	37	93	276	0	0	100	246	0	.....	692	326	.....	.....	7.7	ATL; Coconino Sandstone.
11-17-59	11-17-59	.....	10	.....	70	43	133	276	0	0	90	226	.5	.....	710	354	.....	.....	7.3	Do.
11-17-64	11-17-64	17	12	.....	38	44	178	150	8	8	123	280	.2	.....	758	274	138	1,370	8.6	Coconino Sandstone.
10-25-65	10-25-65	.....	8	.....	92	10	294	288	0	0	230	308	.3	.....	1,090	370	.....	.....	7.5	ATL; Coconino Sandstone.

See footnote at end of table.

Table 4. --Chemical analyses of water from selected wells and springs in southern Coconino County---Continued

Well or spring location	Date of collection	Temperature (°C)	Silica (SiO ₂)	Iron (Fe), in solution at time of analysis	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Remarks
																Calcium, magnesium	Non-carbonate			
(A-18-14)13bad	1-10-63	.....	10	.....	113	12	64		249	0	111	106	0.4	....	541	330	.....	.....	7.6	ATL; Coconino Sandstone and Supai Formation.
10-16-64	.....	.....	10	.....	116	8	152		300	0	100	214	.3	....	750	322	.....	.....	7.6	Do.
10-26-65	.....	.....	.....	.....	76	12	288		300	0	250	254	.2	....	1,040	340	.....	.....	7.6	Do.
13cab	1-8-55	.....	8.2	.....	64	32	14		251	0	90	16	1.2	....	351	290	.....	.....	7.9	ATL; Coconino Sandstone.
3-3-66	.....	.....	.....	.....	66	36	7.1		257	0	99	11	2	....	348	314	.....	587	7.6	Coconino Sandstone.
13dbb	4-27-55	.....	5.2	.....	65	35	13		246	0	110	12	0	....	366	306	.....	.....	7.8	ATL; Coconino Sandstone and Supai Formation.
10-25-65	.....	.....	.....	.....	74	9	133		288	0	215	36	.2	....	620	320	.....	.....	7.6	Do.
36daa	8-2-50	.....	.....	.....	.....	.....	.....	.....	259	0	.....	90	.....	.....	.....	308	.....	887	.....	Coconino Sandstone.
5-3-66	17	.....	.....	.....	72	37	55		255	0	122	82	.1	....	494	332	123	.....	7.7	Do.
(A-18-15)5abb	3-2-66	.....	11	0	78	39	302		246	0	140	470	.3	....	1,160	354	153	2,080	7.5	Do.
30bcc	7-28-65	.....	.....	.....	79	41	469		237	0	155	730	.3	....	.....	364	170	2,890	7.7	Do.
(A-19-12 ₁)13bad	11-1-66	.....	15	.01	103	54	46		194	0	358	34	.3	....	706	480	321	992	7.7	Do.
15cbb	6-22-66	19	22	.05	50	49	17		230	0	154	12	.1	....	417	328	140	652	7.2	OT; Coconino Sandstone.
(A-19-13)5adc	6-18-66	.....	16	0	101	34	28		236	0	212	29	.3	....	537	394	201	805	7.5	Coconino Sandstone.
7bbb	11-20-33	.....	.....	.....	94	44	16		224	0	226	21	0	1.0	512	415	.....	.....	.....	Do.
6- -66	.....	.....	14	.01	91	40	18		230	0	205	21	.2	....	502	392	204	778	7.5	Do.
23abb	6-18-66	.....	30	0	10	36	53		302	0	.....	21	.2	....	309	172	0	512	8.0	Do.
29bab	5-11-66	.....	16	0	114	32	27		226	0	250	22	.1	....	572	418	233	828	7.3	Do.
(A-19-14)2aa	10-11-65	.....	.....	.07	100	42	581	3.9	231	6.3	224	898	.1	2.2	a/1,990	425	236	3,400	7.9	GSL; Coconino Sandstone.
2ba	9-21-66	.....	11	.01	158	50	574		238	0	328	930	.2	....	2,170	600	405	3,800	7.2	Coconino Sandstone.
4acc	8-21-54	.....	13	.....	74	42	550		244	0	175	830	.1	....	.....	358	.....	2,800	7.8	GSL; Coconino Sandstone.
4bbb	11-3-58	16	11	.01	76	39	460		241	0	152	705	.4	.8	1,560	350	152	2,810	7.3	Coconino Sandstone.
21a	3-8-54	16	11	.....	76	42	158		258	0	132	250	.6	1.8	798	362	150	1,420	.....	Do.
.....	8-19-66	18	14	.12	78	40	157		264	0	153	227	1.9	....	801	358	142	1,340	7.5	Do.
.....	11-11-33	.....	.....	.....	79	47	239		264	0	135	392	0	.4	1,020	390	.....	.....	.....	Do.
.....	5-11-66	16	15	0	73	47	260		265	0	135	413	.1	....	1,070	374	157	1,890	7.3	Do.
(A-19-16)6acb	4-30-65	.....	.....	.....	78	25	430		272	0	162	595	.6	....	1,380	296	73	2,560	7.6	CT; Coconino Sandstone
(A-20-8)18bbb	2-14-63	18	13	.....	44	25	6.4	1.9	256	0	5.6	7.8	.4	1.0	231	211	1	411	7.5	Coconino Sandstone and Supai Formation.
(A-20-12 ₁)1ddd	5-12-66	16	11	0	86	45	36		198	0	253	36	.1	....	565	398	236	832	7.5	Coconino Sandstone.

See footnote at end of table.

Table 4. --Chemical analyses of water from selected wells and springs in southern Coconino County--Continued

Well or spring location	Date of collection	Temperature (°C)	Silica (SiO ₂)	Iron (Fe), in solution at time of analysis	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Remarks	
																Calcium, magnesium	Non-carbonate				
(A-20-12½)14dda	11-20-33 3-12-53		 7.6		108 98	50 47	25 20		226 207	0 0	295 269	26 22	0 .3	1.2 .2	616 566	475 438	268	 859			Coconino Sandstone. Do.
24cbb	7-8-46 5- -66		 13	 0.01	105 106	45 44	31 30		225 224	0 0	280 281	26 24	0 .2	1.7	600 608	447 446	263	891 890	 7.5	CT; Coconino Sandstone. Do.	
(A-20-13)21da . .	5-11-66	16		0	87	42	63		223	0	193	100	1			388	206	975	7.6	Coconino Sandstone.	
35da	11-20-33				78	43	33		232	0	157	63	0	.2	488	371					Do.
3-12-53	3-12-53		12		78	40	33		233	0	143	64	.2	.4	486	359	168	808			Do.
5-12-66	5-12-66		13	07	76	40	36		236	0	147	62	.1		490	356	163	799	7.6		Do.
(A-20-14)7b	5-11-66		11	.01	98	50	111		236	0	225	189	0		800	452	259	1,360	7.5		Do.
(A-21-2)3ba	8-17-63	11	67		28	6.8	14		134	0	5.2	9.2	.2	.7	197	98	0	243	7.3		Volcanic rocks.
(A-21-5)2abc1	8-22-49		20		29	13	9		127	0	22	13	0	.2	169	126	22	280			CT; volcanic rocks and silt.
11cbe	10-31-55		12	.01	23	5.5	5.5		97	0	6.4	2.8	.1	1.7	105	80	0	172	7.8		Supai Formation.
(A-21-6)35cba	12-15-54	11	21		21	13	7.4		140	0	2.3	3.0	.2	.7	138	106	0	222			Coconino Sandstone and Supai Formation.
35ccc	4-3-58		56		31	13	15		178	0	9.1	5.0	.3	1.0	218	131	0	288	8.2		Do.
(A-21-7)22aad	10-31-56								243	0		14				217	18	419	7.6		Supai Formation.
32bbe	10-2-56	11							260	0		3.0				231	18	406	7.9		Coconino Sandstone and Supai Formation.
(A-21-9)14acc	5-16-66	12	13	0	31	18	7.6		156	0	10	21	.1		178	152	24	317	7.6		Do.
(A-21-11)24d	9-7-50	16	12		102	63	62		148	0	424	58	.2	2.2	796	514	392	1,160			Coconino Sandstone.
(A-21-12)3cb	3-15-55				70	41			216	0		23				343	166	856	7.4		Do.
17bd	4-22-55	16	11		67	40	100		190	0	312	48	.4	.2	672	334	178	1,020	7.3		Do.
(A-21-12½)14ac	9-7-50	17	11		90	48	23		202	0	264	22	.2	1.4	560	422	256	840			Do.
(A-21-13)4ba	9-8-65			.03	102	43	74	4	198	10	222	107	.15	.4	a/744	430	268	1,190	8.0		GSL; Kaibab (?) Limestone and Coconino Sandstone.
22ad	9-7-50	17	12		98	53	136		235	0	246	218	.2	1.5	881	462	270	1,470			Coconino Sandstone.
35bc	5-11-54	21	14		102	45	85		218	0	255	127	.2	.8	736	440	261	1,170			Do.
(A-21-14)9dd	5-11-54	17	13		105	51	807		280	0	204	1,260	.3	6.2	2,580	472	242	4,550			Kaibab Limestone and Coconino Sandstone.
25cc	10-12-55	16	10		131	52	1,710		299	0	444	2,510	.6	5.6	5,010	541	296	8,340	7.2		Coconino Sandstone.
4)26dc	8-15-50	11	28		22	9.8	15		123	0	13	8	.4	2.5	160	96	0	241			Volcanic rocks.
(A-22-8)35aac	1-11-67		15	.18	28	14	6.2		146	0	7.0	12	.2		154	130	10	290	7.5		Supai Formation.
(A-22-9)29bac	8-9-62		12		24	11	12	1.6	110	0	7.2	19	.3	8.4	150	107	17	265	7.2		CT; Supai Formation.

See footnote at end of table.

Table 4. --Chemical analyses of water from selected wells and springs in southern Coconino County --Continued

Well or spring location	Date of collection	Temperature (°C)	Silica (SiO ₂)	Iron (Fe) in solution at time of analysis	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Remarks
																Calcium, magnesium	Non-carbonate			
(A-22-10)3aca	7-18-65	.....	.....	.....	49	53	33		182	0	221	25	0.3	.....	.....	342	193	756	7.5	CT; Supai Formation.
(A-22-11)19cc	10-20-54	.....	11	.....	45	25	22		138	0	116	19	.4	0.8	307	216	102	513	.....	Coconino Sandstone.
35bc	11-20-53	15	12	.....	41	20	4.1		211	0	11	4.5	.4	1.8	199	184	12	346	.....	Coconino Sandstone and Supai Formation.
(A-22-12)11cb	4-14-53	17	12	.....	94	44	63		208	0	230	100	.2	.8	646	416	245	1,030	.....	Coconino Sandstone.
15ab	8-19-51	.....	13	.....	102	49	214		209	0	258	340	.2	2.4	1,080	456	284	1,840	.....	Do.
17bc	3-22-55	16	.....	.....	90	46	.....	.....	221	0	.....	37	.....	.....	.....	414	232	921	7.5	Do.
25dd	11-2-53	.....	13	.....	94	44	26		217	0	235	34	.6	1.0	555	416	238	846	.....	OT; Coconino Sandstone.
(A-22-12)36cd	9-8-65	.....	.....	.03	98	38	55	2.7	177	13	249	76	.2	1.2	a/676	400	255	1,020	8.0	GSL; Coconino Sandstone.
(A-22-13)18ad	9-8-50	.....	11	.....	102	59	192		250	0	262	308	.2	1.3	1,060	497	292	1,770	.....	CT; Kaibab Limestone and Coconino(?) Sandstone.
18bc	9-7-65	.....	.....	.03	96	50	131	3.3	207	12	240	201	.2	1.0	a/908	445	276	1,470	7.8	GSL; Kaibab(?) Limestone and Coconino Sandstone.
18cb	9-7-65	.....	.....	.....	98	50	129	3.6	266	12	226	194	.2	1.2	a/906	450	282	1,430	7.9	Do.
18da	9-7-65	.....	.....	.03	98	50	161	3.3	221	9.0	239	249	.2	.4	a/1,020	450	268	1,620	.....	GSL; Kaibab Limestone and Coconino Sandstone.
(A-23-8)16dcd2	5-5-65	16	36	.02	148	35	19	2.2	644	0	3.2	5.0	.4	8.8	575	512	0	945	6.9	Supai Formation.
(A-23-10)1bb	10-19-54	.....	8.5	.....	57	47	159		205	0	213	205	.8	.3	792	336	168	1,330	.....	Coconino(?) Sandstone.
13dc	10-19-54	.....	12	.....	73	57	147		200	0	230	236	.5	.....	.....	416	252	1,440	8.0	Do.
(A-23-11)28a	7-18-65	.....	.....	.....	93	59	370		172	0	270	605	.6	3.2	1,500	474	334	2,590	.....	Do.
(A-23-12)7dc	6-10-51	.....	12	.....	89	65	359		.....	0	255	615	.6	.....	.....	490	353	2,610	7.6	Do.
26c	4-7-55	.....	13	.....	104	59	365		201	0	275	598	.2	2.0	1,510	502	338	2,610	.....	Coconino Sandstone.
(A-24-5)11cac	5-11-54	19	13	.....	83	62	259		235	0	262	395	.2	2.7	1,190	462	270	2,020	7.8	Do.
(A-25-6)20bdd	7-7-65	11	.....	.....	91	48	141		220	0	219	228	.4	.5	849	424	244	1,430	.....	Do.
(A-25-9)6cca	6-25-65	.....	.....	.....	12	10	11		98	0	7	5.5	<.2	.....	.....	72	0	186	8.0	Volcanic rocks and sand.
(A-25-10)30bca	1-25-67	20	16	.02	42	16	14		174	0	18	28	.1	.....	.....	169	27	407	8.1	Volcanic rocks.
2-1-61	10-27-58	19	10	.....	102	48	60		452	0	83	90	.5	.....	622	454	84	1,050	7.4	Supai Formation.
(A-26-8)1b	10-5-66	.....	18	01	69	62	218		224	0	200	360	.8	1.3	1,030	427	244	1,850	7.7	Coconino Sandstone.
		19	10	.....	76	68	244		243	0	219	405	.2	1.1	1,140	468	269	1,990	7.8	Do.
		.....	.....	.....	212	68	71		890	0	92	98	.8	.....	998	810	80	1,630	6.8	CT; Coconino Sandstone and Supai Formation.

See footnote at end of table.

Table 4. --Chemical analyses of water from selected wells and springs in southern Coconino County--Continued

Well or spring location	Date of collection	Temperature (°C)	Silica (SiO ₂)	Iron (Fe), in solution at time of analysis	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Remarks
																Calcium, magnesium	Non-carbonate			
(A-26-10)8cda . . .	11-10-66	.....	12	0.02	146	91	2,600		284	0	450	4,200	0.4	.....	7,640	740	508	12,900	7.9	CT; Coconino Sandstone.
31ca	10-26-54	.....	9.4	.....	67	62	257		240	.....	198	408	.8	1.7	1,120	422	.....	2,010	.....	Do.
(A-27-9)8dc'	5-15-56	17	11	.....	101	58	27		536	0	32	53	.4	.6	547	490	51	980	7.5	CT; Supai Formation.
5-12-66	.....	.....	.....	0	95	62	39		527	0	43	70	.4	.....	.....	492	60	1,000	7.6	Supai Formation.
6dc'2	5-12-66	.....	14	0	102	57	41		532	0	43	68	.5	.....	588	490	54	1,000	7.2	Do.
7abb	5-12-66	.....	15	0	85	71	36		564	0	39	58	.2	.....	582	506	44	1,010	7.5	CT; Supai Formation.
11ddd	11-12-66	.....	10	.02	66	91	1,380		276	0	280	2,150	.5	.....	4,110	540	314	7,220	7.8	Coconino Sandstone.
(A-27-10)6abc	11-10-66	.....	16	.02	8.0	2.4	236		370	0	148	54	3.8	.....	766	30	0	1,050	7.7	Chinle Formation (Shinarump Member).
(A-28-8)36bac	6-20-58	18	15	.....	77	39	38		441	0	36	24	.7	.1	447	352	0	776	7.7	Coconino Sandstone.
(A-28-9)35bac	4-5-55	17	9.1	.....	95	63	927		265	0	250	1,440	.5	3.8	2,920	496	279	5,180	7.3	Kaibab Limestone.
(A-29-9)22dca	4-20-51	.....	13	.....	118	61	973		300	0	258	1,520	.3	1.9	3,090	546	300	5,480	.....	Kaibab Limestone and Coconino Sandstone.
(A-30-2)25c	12- -63	.....	.....	< .5	124	41	10		.....	.....	255	21	.3	.....	a/658	480	.....	.....	.....	ASHL; Torowasp Formation.
(A-31-2)7	10-16-57	.....	9.2	.....	52	31	27		267	0	33	44	.2	.1	328	257	38	584	.....	Hermit Springs; Muav Limestone.
13abb	4-9-58	12	12	.....	54	35	11		308	0	28	14	.2	.2	305	278	26	543	.....	Indian Gardens Spring; Muav Limestone.
(A-32-7)31b	6-14-50	.....	19	.....	264	79	534		964	0	147	815	.2	3.2	2,340	984	194	3,940	.....	Blue Spring; Muav Limestone.
5-17-66	21	17	0	.....	252	76	535		951	0	140	835	.3	.....	2,320	940	161	3,960	6.8	Do.
(A-33-6)33b	5-17-66	22	17	0	112	77	761		464	0	170	1,200	.2	.....	2,560	595	215	4,540	7.3	Composite of all spring flow from Blue Spring to mile 3.1; Muav Limestone.
(B-23-7)10cdd	7-12-66	24	15	0	120	79	765		494	0	170	1,210	.2	.....	2,600	625	.....	4,580	7.8	Do.
5-2-66	.....	.....	.....	1.26	23	33	86		380	<.1	5.9	57	.8	<1.0	.....	190	.....	770	7.9	ASHL; Redwall Limestone and Martin(?) Limestone.
(B-27-6)1adc	5-15-58	22	26	.....	486	106	30		93	0	1,480	70	.6	.....	2,220	1,650	1,580	2,580	7.8	Alluvium.
(B-27-9)16d	4-25-66	.....	.....	.....	50	21	18		228	0	15	24	.5	15	282	212	.....	460	.....	Diamond Spring; Muav Limestone.
(B-28-7)31c	4-25-66	.....	.....	.....	78	10	1.4		234	0	25	16	.2	.....	246	238	46	496	7.5	CT; alluvium.
(B-28-8)24da	4-25-66	.....	.....	.....	62	10	2.3		213	0	8.0	14	.2	.....	202	198	24	399	7.5	Alluvium.
(B-29-1)12dbd	10-14-66	.....	12	.02	134	33	14		264	0	262	8.0	.6	.....	594	470	254	848	7.3	CT; Coconino Sandstone.
(B-30-1)28aaa2	6-3-58	19	10	.....	229	64	27		225	0	667	8.5	.3	2.4	1,120	834	650	1,390	8.2	Coconino Sandstone.

See footnote at end of table.

Table 4. --Chemical analyses of water from selected wells and springs in southern Coconino County--Continued

Well or spring location	Date of collection	Temperature (°C)	Silica (SiO ₂)	Iron (Fe), in solution at time of analysis	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Specific conductance (micro-mhos at 23° C)	pH	Remarks
																Calcium, magnesium	Non-carbonate			
(B-33-4)26	10-20-50	21	18	.....	133	48	27	588	0	36	48	0.2	1.4	602	530	48	1,030	.....		Havas Spring, Pennsylvanian limestone unit. Do.
(B-33-7)30(?)	8-7-65	.....	.....	.....	74	45	.....	416	0	36	48	.2	.....	.....	368	.....	820	7.7		
	6-29-60	26	.....	.....	54	80	58	532	0	38	80	.....	.....	572	462	26	1,100	.....		Warm Spring, Muav Limestone.

a/ Total dissolved solids determined by residue on evaporation at 180°C.



FIGURE 4. LOCATION OF SELECTED WELLS AND SPRINGS AND ALTITUDE OF THE WATER LEVEL IN THE COCONINO SANDSTONE AND SUPAI FORMATION, JUNE 1967, SOUTHERN COCONINO COUNTY.

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No.

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No.

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- *32. Annual report on ground water in Arizona, spring 1965 to spring 1966, by E. B. Hodges and others: 61 p., 22 figs., 1967.
33. Basic ground-water data for southern Cocoino County, Arizona, by E. H. McGavock: 49 p., 4 figs., 1968.

