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LOG OF HYDROLOGIC TEST WELL 1, TATUM DOME AREA,
LAMAR COUNTY, MISSISSIPPI

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LAMAR COUNTY, MISSISSIPPI

By

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Hydrologic Test Well 1, the first multiple-test well, was drilled about one-half mile northeast of Tatum salt dome, Lamar County, Miss. (fig. 1). It is at Atomic Energy Commission coordinates 12,273 N. and 12,759 E., approximately 370 feet southeast of the center of sec. 12, T. 2 N., R. 16 W., at an altitude of 315 feet above sea level. Hydrologic Test Well 1 was drilled as part of the Public Safety Program, which requires determination of the geologic and hydrologic conditions that exist on and near the dome. The well is one of several test wells drilled or planned for exploration of hydrologic conditions at Tatum salt dome. The well was drilled by the Layne-Central Company.

The depth, thickness, general characteristics, and stratigraphic sequence of the formations and aquifers are shown on figure 2. A detailed description of the drill samples, sidewall cores, and vertical cores is given in tables 1 and 2.

The attitude and areal extent of the aquifers is being determined by relating the information obtained from this test well to information from other test holes, wells, and seismic data available in the Tatum dome area.

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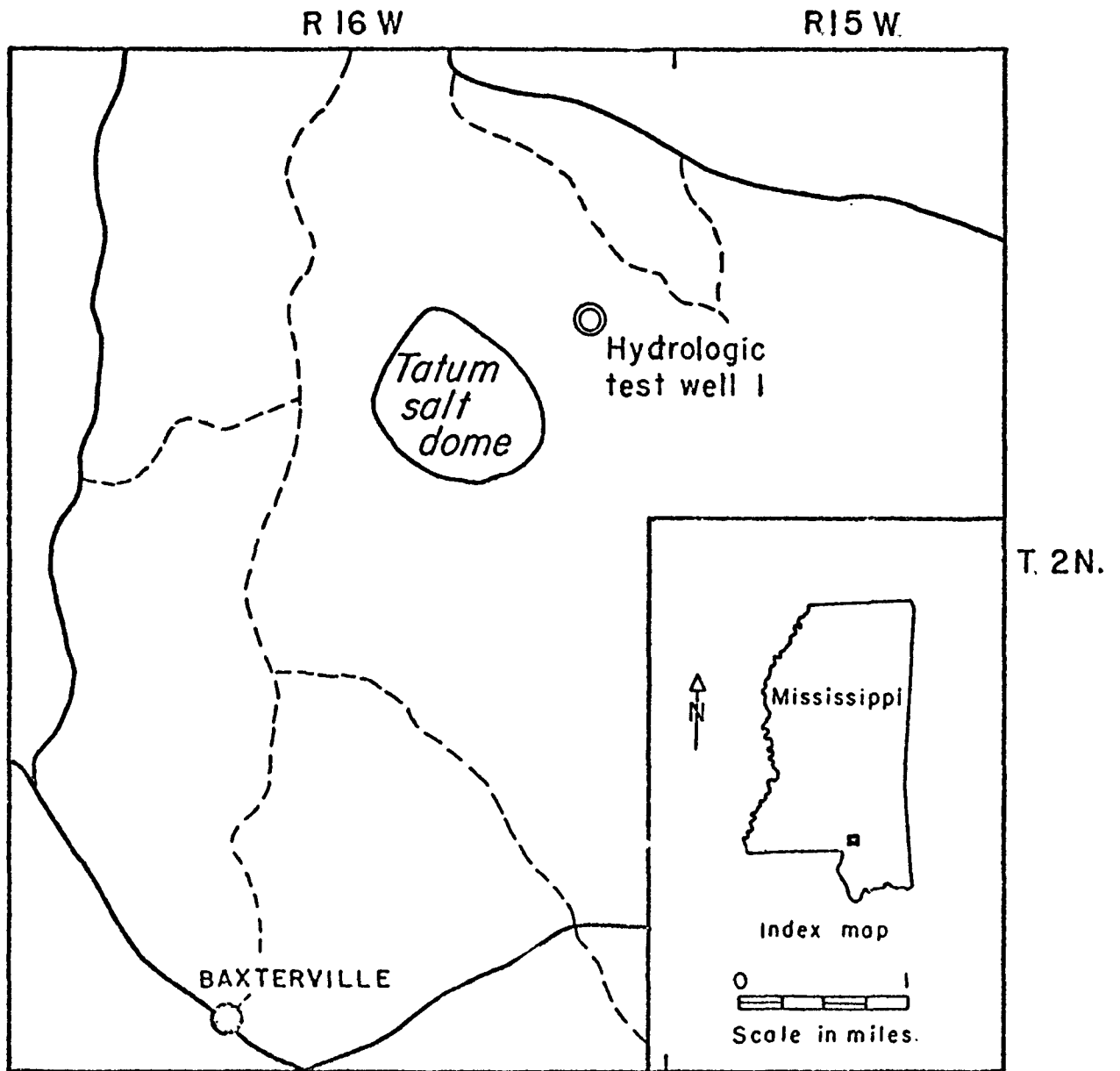


Figure 1.--Location of Hydrologic Test Well 1.

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The geologic units penetrated in the test well from top to bottom are: terrace deposits, composed predominantly of iron-stained sand and clay with minor amounts of gravel and silt; Pascagoula and Hattiesburg Formations undifferentiated, composed of greenish-gray to light-gray silty clay and fine to coarse sand; Catahoula Sandstone, composed of sands and greenish-gray to light-gray clays and minor amounts of carbonaceous material in the upper part, and calcareous sand and soft limestone in the lower part; Chickasawhay(?) Limestone, composed of gray clays and fine to medium calcareous sand; Vicksburg Group, composed of greenish-gray calcareous clay in the upper part, medium to coarse gray sand in the middle, and finely crystalline white limestone at the bottom; Red Bluff Clay, white to greenish-gray chalky clay; Yazoo Clay, soft calcareous greenish-gray clay; Moodys Branch Limestone, finely crystalline glauconite white limestone; Cockfield Formation, chocolate-brown carbonaceous clay with thin beds of glauconitic sand; Cook Mountain Limestone consisting of white finely crystalline limestone and dark-gray clay; and Sparta Sand and Zilpha Clay, composed of light-green and gray siltstone.

There are several easily definable fresh-water aquifers and one brine aquifer in the strata surrounding the dome (see fig. 2), of which five were tested. Some aquifers extend over the top of the dome.

Hydrologic Test Well 1 was drilled to a depth of 2,616 feet with rotary equipment. Gamma ray-neutron, electric, micro, and sonic logs were obtained. Fifty-three side-wall cores were taken at selected

places and ordinary rotary-cut core was taken at three places.

Two strings of casing were installed from the surface as follows: 16-inch OD blank steel casing to 320 feet, cemented back to the surface; and 9 5/8-inch OD blank steel casing to 2,240 feet, cemented back to the bottom of the 16-inch casing.

Each fresh water aquifer was tested by: (1) gun-perforating the casing; (2) developing the aquifer by air-jetting followed by pumping with a turbine pump; and (3) making recovery and drawdown tests. After the tests were completed, aquifers 1 and 2 were plugged by squeezing cement into the perforations. Observation wells were completed in aquifers 3, 4, and 5.

Developing and testing of the saline aquifer (number 5) were postponed until later, but provision for later testing was made by installing sections of slotted casing, 3 1/2 inches in diameter, opposite the aquifer.

It has been determined from seismic data that the aquifers encountered at Hydrologic Test Well 1 have a slightly northward dip toward the lower part of the syncline which rims the Tatum salt dome. The regional dip of the sedimentary rocks is toward the south-southwest. The salt dome interrupts this regional dip.

In addition to pumping tests, the hydrologic characteristics of the aquifers and the confining beds are being determined in the laboratory from core samples.

Samples of water were taken from each of the numbered aquifers, as shown in figure 2. Chemical analyses of these samples are given

in table 3, but the radiochemical analyses will not be available until later.

The static water levels for the five aquifers tested in Hydrologic Test Well 1 were as follows, in feet below the land surface (altitude, 315 feet).

Aquifer	Date	Water level
1	5-28-61	138.1
2	6-30-61	146.9
3	--do----	148.5
4	--do----	121.6
5	--do----	94.0

Table 1.--Lithologic log of Hydrologic Test Well 1 (SWC, sidewall core; datum is rotary table, altitude 321 feet)

	Depth (feet)	Thickness (feet)
Terrace deposits		
Samples missing-----	60	60
Sand, light-brownish-gray and light-gray, fine to medium, subrounded to angular, loose; 50 percent light-gray, soft clay-----	100	40
Pascagoula and Hattiesburg Formations undifferentiated (Top at 80 feet, interpreted from E-log)		
Clay, light-gray, soft; 20 percent loose, angular and subrounded, medium to coarse-grained, light gray sand-----	120	20
Clay, light-gray, soft; 40 percent loose, angular and subrounded, medium to coarse, light-gray sand-----	140	20
Samples missing-----	200	60
Clay, light-gray and white; soft, calcareous; trace of sand as above-----	240	40
Clay, light-gray and greenish gray, soft; trace of sand as above-----	280	40
Clay, light-gray to light-tannish-gray, soft; trace of very coarse, subrounded, quartz sand; trace of muscovite-----	350	70
Samples missing-----	380	30
Sand, light-gray to gray-tan, medium to very coarse, subrounded, loose; 10 percent soft, light-tan to greenish-gray clay-----	390	10
Sand, light-brown, fine to coarse, subrounded to angular, loose; contains light-brown, soft silt-----	410	20

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Pascagoula and Hattiesburg Formations undifferentiated--Continued		
Clay, light-green, soft, slightly calcareous---	440	30
Clay, gray-tan to greenish-tan, soft; contains fine to coarse, rounded, light-gray sand and rounded, black chert grains-----	450	10
Clay, light-green, soft; slightly calcareous, fine to medium, gray sand-----	480	30
Sand, yellowish-gray to yellowish-tan, medium to fine-subrounded to subangular, loose; contains grains of subrounded, fine, black chert, and fine to coarse muscovite; trace of calcareous cementing material-----	SWC-474	
Sand, greenish-gray, fine to medium, loose, subangular, slightly calcareous-----	510	30
Sand, greenish-gray, fine to coarse, subangular, loose, calcareous; contains subrounded, black chert particles and small grayish-green clay particles. Trace of rust-red, soft clay-----	560	50
Clay, light-grayish-green, calcareous, soft; contains numerous loose, subangular particles and small masses of light-gray, fine sand----	SWC-518	
Clay, light-grayish-green, calcareous, soft; contains subrounded, fine-grained, black chert and fine- to medium-grained sand-----	SWC-544	
Sand, light-gray, fine to medium, subrounded to subangular, loose, slightly calcareous; contains small particles of subrounded, carbonaceous shale and muscovite-----	600	40
Clay, light-greenish-gray, slightly calcareous, soft-----	SWC-582	

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Pascagoula and Hattiesburg Formations undifferentiated--Continued		
Clay, light-greenish-gray, slightly calcareous, soft; contains small muscovite flakes-----	SWC-596	
Clay, light-greenish-gray, calcareous, soft; contains fine to medium, subangular sand and small particles of soft, black carbonaceous shale. Fish tooth noted between 628 and 648 feet-----	648	48
Sand, light-gray, medium to very coarse, subangular, loose, slightly calcareous; contains small particles of carbonaceous shale, muscovite, and dark-gray chert-----	SWC-644	
Sand, light-greenish-gray, medium to coarse, subangular, loose, slightly calcareous; contains clay, trace of black, carbonaceous shale and dark-gray, angular chert-----	688	40
Sand, light-green, very fine, rounded, slightly calcareous, loose, and light-green, soft clay-----	SWC-676	
Sand, light-gray, fine to medium, rounded to subangular, slightly calcareous, loose; contains light-gray and light-rust-red clay, muscovite, and black, carbonaceous shale-----	717	29
Sand, light-gray to light-gray-brown, fine to medium, rounded, slightly carbonaceous, loose; contains clay, muscovite, and black shale-----	748	31
Sand, light-gray, very fine, rounded to subangular, loose; contains muscovite and black, carbonaceous shale-----	SWC-722	
Sand, light-gray, fine to very coarse, rounded to subangular, slightly calcareous, loose; contains black, carbonaceous shale and muscovite-----	SWC-744	

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Pascagoula and Hattiesburg Formations undifferentiated--Continued		
Sand, light-gray, fine to very coarse, rounded to subangular, slightly calcareous, loose; contains black, carbonaceous shale and muscovite-----	769	21
Samples missing-----	779	10
Sand, light-gray, fine, subangular, loose; contains muscovite and black, carbonaceous shale-----	SWC-775	
Sand, light-reddish-gray, medium to coarse, subangular, slightly calcareous, loose; contains light-reddish clay and black, carbonaceous shale-----	809	30
Sand, light-gray, fine to very coarse, subangular, slightly calcareous, loose; trace of carbonaceous shale and soft, gray clay-----	840	31
Clay, gray, soft; with small, black, carbonaceous shale particles and trace of muscovite-----	SWC-824	
Sand, light-gray, fine, loose; large amount of light-gray clay-----	869	29
Sand, light-gray, fine to coarse, loose; some light-gray clay-----	899	30
Sand, light-gray, fine, loose; contains small, black, carbonaceous shale particles-----	SWC-880	
Sand, light-gray, fine to coarse, subrounded, loose; small amount of black, carbonaceous shale, and trace of crystalline pyrite-----	929	30
Sand, light-gray, fine, subangular, slightly calcareous, loose; trace of black, carbonaceous shale-----	SWC-912	

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Pascagoula and Hattiesburg Formations undifferentiated--Continued		
Sand, light-gray, medium-grained with some fine to coarse grains, rounded to subrounded, loose; some angular sand-----	960	31
Sand, gray, coarse to very coarse, subrounded to rounded, calcareous, loose; contains muscovite and black, carbonaceous shale-----	SWC-942	
Sand, light-gray, fine to very coarse, sub-angular, slightly calcareous; some black, carbonaceous shale-----	990	30
Clay, gray, soft; black, carbonaceous shale particles, and fine- to medium-grained, loose sand-----	SWC-978	
Sand, light-gray, fine to coarse, subrounded, loose sand; with black, carbonaceous and calcareous shale particles and crystalline pyrite-----	1,040	50
Catahoula Sandstone (Top at 1,140 feet, interpreted from E-log)		
Sand, light-gray, medium to coarse, subrounded to subangular, loose; small, black, carbonaceous shale particles intermixed-----	1,160	120
Clay, gray, soft, calcareous, fossiliferous; and very fine sand-----	SWC-1,046	
Sand, light-gray, fine to medium, subrounded to subangular, calcareous, loose; contains small, black, carbonaceous shale particles----	SWC-1,080	
Sand, light-gray, medium to very coarse, subrounded, slightly carbonaceous, loose; and small, rounded, black, carbonaceous shale particles-----	SWC-1,120	

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Catahoula Sandstone--Continued		
Clay, light-greenish-gray, calcareous; and very fine grained sand-----	SWC-1,160	
Sand, light-gray, very coarse, angular to subangular, loose; with some fine to medium, rounded sand, and black, carbonaceous shale--	1,200	40
Sand, gray to light-gray, fine to coarse, rounded to subangular, slightly calcareous, loose; with black shale particles and light- gray silt-----	1,230	30
Sand, light-gray, fine, subrounded, calcareous, loose; contains rounded, coarse sand grains and rounded, black, shale particles-----	SWC-1,215	
Sand, light-gray, medium to coarse, rounded slightly calcareous, loose; crystalline pyrite and black, carbonaceous shale intermixed-----	1,260	30
Sand, light-gray, fine to coarse, subangular to subrounded, calcareous, loose; with black, carbonaceous shale particles intermixed-----	SWC-1,233	
Sand, light-gray, fine to coarse, subrounded to subangular, calcareous, loose; some black shale particles-----	1,290	30
Sand, light-gray, medium to coarse, subangular, calcareous, loose; black, carbonaceous shale particles intermixed-----	SWC-1,263	
Sand, light-gray, medium to very coarse, rounded to subangular, loose; black, shale particles and trace of muscovite and crystalline pyrite-----	1,335	45
Clay, light-green, slightly calcareous, soft; contains crystalline pyrite, and very fine, light-gray sand-----	SWC-1,318	

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Catahoula Sandstone--Continued		
Sand, light-gray, very fine, slightly calcareous-----	SWC-1,328	
Sand, light-gray, very fine, slightly calcareous; and clay, light-green, soft, slightly calcareous-----	1,355	20
Sand, light-greenish-gray, fine to coarse, subangular, slightly calcareous, loose; with very coarse, rounded sand grains and light-green clay-----	SWC-1,347	
Sand, light-gray, fine to very coarse, rounded, loose; contains black, carbonaceous shale and crystalline pyrite-----	1,375	20
Clay, gray, soft-----	SWC-1,371	
Catahoula Sandstone, Heterostegina zone (Top at 1,373 feet, interpreted from E-log)		
Sand, light-gray, fine to coarse, rounded, loose; black, carbonaceous shale and crystalline pyrite intermixed-----	1,382	7
Limestone, light-gray, finely crystalline, mottled with small black particles, soft; contains from 25 to 50 percent loose, rounded, fine-grained sand-----	1,385	3
Limestone, light-gray, finely crystalline, mottled with small black particles, soft; contains very coarse sand grains, and fossils (<u>Sorites</u>)-----	1,391	6
Clay, gray to black, calcareous, soft; and gray, finely crystalline, partly fossiliferous, soft limestone-----	1,411	20
Limestone, light-gray, finely crystalline, soft; black particles and very coarse, rounded sand grains-----	1,431	20

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Catahoula Sandstone, Heterostegina zone--Continued		
Samples missing-----	1,450	19
Limestone, white, finely crystalline, soft; with black fossil fragments-----	SWC-1,431	
Limestone, grayish-white, finely crystalline, soft; black fossil fragments and crystalline pyrite-----	1,460	10
Limestone, grayish-white, finely crystalline, soft; with dark-gray particles and fine-grained sand-----	SWC-1,459	
Limestone, grayish-white, finely crystalline, soft; dark-gray particles; 25 to 50 percent light-gray, fine to coarse, poorly consolidated sand-----	1,470	10
Limestone, grayish-white, finely crystalline, soft, contains dark-gray particles, 25 to 50 percent poorly consolidated sand, light- gray, coarsely crystalline, rounded-----	1,530	60
Clay, white and green, soft, calcareous; contains a few gray particles, and muscovite; intermixed in the white clay are coarse, rounded sand grains; thin chocolate-brown clays separate the white and green clays-----	SWC-1,513	
Chickasawhay(?) Limestone (Top at 1,530 feet, interpreted from E-log)		
Sand, greenish-gray, very fine to coarse, soft, poorly consolidated; contains muscovite and 10 to 25 percent grayish-green clay-----	1,580	50
Sand, greenish-gray, very fine grained, sub- angular; trace of grayish-green, soft clay-----	SWC-1,548	
Clay, gray, soft; 50 percent light-gray, fine to coarse, subrounded, calcareous, sand-----	1,620	40

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Chickasawhay (?) Limestone--Continued		
Sand, gray to brownish-gray, fine to medium, subangular, calcareous, poorly consolidated; small, black shale particles and a few particles of muscovite intermixed-----	SWC-1,588	
Clay, white to gray and light-green, calcareous, soft; and light-gray, medium to coarse, angular to subrounded sand. Trace of muscovite-----	SWC-1,609	
Bucatunna Clay Member and middle member of Byram Formation (Top at 1,622 feet, interpreted from E-log)		
Clay, grayish-brown to light-gray, calcareous, soft; contains 50 percent light-gray, medium to coarse, angular to subrounded, gray sand; black shale particles intermixed-----	1,650	30
Clay, greenish-brown, light-gray and grayish-green, calcareous, soft; contains medium- to coarse-grained, angular to rounded, light-gray sand-----	1,670	20
Clay, gray, light-reddish-gray, orange, and light-greenish-gray, soft; calcareous; crystalline pyrite-----	1,681	11
Clay, grayish-green, calcareous, soft; with borings filled with calcareous sand; finely crystalline pyrite and trace of dark-gray clay around and in the borings-----	SWC-1,672	
Clay, gray, very calcareous, soft; contains large quantities of light-gray shell fragments and lesser amounts of medium to very coarse, subangular quartz sand grains-----	SWC-1,679	
Samples missing-----	1,690	9

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Bucatumna Clay Member and middle member of Byram Formation--Continued		
Sand, grayish-green, coarse, subangular, calcareous; film of white calcium carbonate around many sand grains. Trace of chocolate- and greenish-gray clay-----	SWC-1,687	
Glendon Limestone Member of Byram Formation and Marianna Limestone undifferentiated (Top at 1,743 feet, interpreted from E-log)		
Sand, gray, fine to coarse, subangular, poorly consolidated; black shale particles and very coarse, rounded sand grains intermixed-----	1,755	65
Sand, gray, very coarse, subangular to subrounded, poorly consolidated; 40 percent soft, finely crystalline, dense limestone. Contains some black shale particles-----	1,770	15
Limestone, gray, finely crystalline, dense; 10 percent soft, subrounded to subangular, coarse-grained, gray sand-----	1,890	120
Limestone, white, finely crystalline, soft; contains black particles-----	SWC-1,790	
Limestone, white to chocolate-gray, finely crystalline; contains dark-gray and black particles-----	SWC-1,889	
Limestone, white, finely crystalline, soft; and very coarse, rounded sand grains-----	1,910	21
Limestone, white, finely crystalline, soft; contains a few small gray particles-----	SWC-1,899	

Table 1.--Lithologic log of Hydrologic Test Well - continued

	Depth (feet)	Thickness (feet)
Red Bluff Clay		
(Top at 1,902 feet, interpreted from E-log)		
Limestone, white, finely crystalline, soft; with coarse to very coarse, rounded to subangular quartz sand-----	1,927	17
Clay, light-grayish-green, calcareous, soft-----	SWC-1,913	
Clay, white, very calcareous, soft-----	SWC-1,926	
Yazoo Clay		
(Top at 1,953 feet, interpreted from E-log)		
Clay, gray, calcareous, soft; contains very coarse, subangular quartz sand-----	2,000	73
Clay, gray, calcareous, soft-----	2,022	22
Clay, light-greenish-gray, calcareous, soft; with black, carbonaceous particles and shell fragments-----	2,042	20
Clay, light-gray, calcareous, soft-----	2,122	80
Moodys Branch Limestone		
(Top at 2,130 feet, interpreted from E-log)		
Clay, light-gray, calcareous, soft; and limestone, white, finely crystalline, soft, with foraminifera-----	2,141	19
Limestone, white, finely crystalline, soft; contains dark-grayish-green glauconite and crystalline pyrite-----	SWC-2,135	
Cockfield Formation		
(Top at 2,158 feet, interpreted from E-log)		
Limestone, white, finely crystalline, soft, with fossils; 50 percent dark-gray, soft calcareous clay-----	2,160	19

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Cockfield Formation--Continued		
Clay, dark-gray, soft; dark-green glauconite; white, finely crystalline limestone and medium- to very coarse sand-----	2,180	20
Clay, light-chocolate-brown, calcareous, soft; and very fine, subangular sand in thin bands---	SWC-2,164	
Clay, dark-gray, calcareous, soft; with dark- grayish-green glauconite-----	2,200	20
Limestone, light-tannish-white, glauconitic with foraminifera-----	2,220	20
Clay, light-gray, calcareous, soft; contains dark-green glauconite; dark-gray and greenish- gray, slightly calcareous clay, contains pyrite; and yellowish-green clay, slightly calcareous to calcareous, very glauconitic; the light-gray and yellowish-green clays are separated by dark-gray clay-----	SWC-2,211	
Limestone, light-gray, finely crystalline, soft; and clay, dark-greenish-gray, soft, calcareous-----	2,228	8
Clay, dark-greenish-gray, calcareous, soft; contains shell fragments-----	SWC-2,221	
Limestone, white, finely crystalline, moderately hard, dense-----	SWC-2,225	
Cook Mountain Limestone (Top at 2,240 feet, interpreted from E-log)		
Limestone, brownish-white, finely crystalline, soft; contains black particles and small masses of coarsely crystalline pyrite-----	2,268	42
Clay, dark-greenish-gray, calcareous, soft; with large amount of glauconite and fossil shell fragments-----	SWC-2,235	

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Cook Mountain Limestone--Continued		
Limestone, white, finely crystalline, soft; with dark-greenish-gray clay, and small, tannish-white finely crystalline limestone particles--	SWC-2,244	
Limestone, white, finely crystalline, soft; dark-greenish-gray soft clay, tannish-white finely crystalline limestone particles, and trace of light-gray very fine grained sand. Clay, light-chocolate-brown, and gray to light-gray, soft; contains dark-greenish-gray glauconite-----	SWC-2,246	
Samples missing-----	2,280	12
Limestone, white, finely crystalline, soft, with foraminifera; and very coarse to medium, rounded to subangular quartz sand, with small amount of dark-grayish-green glauconite-----	2,300	20
Limestone, light-gray, finely crystalline, soft; fossiliferous; some glauconite and sand-----	2,340	40
Limestone, white, finely crystalline, soft; contains tannish-white, finely crystalline calcite and limestone particles-----	SWC-2,329	
Limestone, white, finely crystalline, soft; and light-gray, medium to coarse, rounded to subangular, poorly consolidated sand-----	2,350	10
Limestone, white, finely crystalline, soft; contains light-gray and tannish-gray, finely crystalline calcite-----	SWC-2,347	
Limestone, tan and white, finely crystalline, soft; contains light-gray, medium to coarse, rounded to subangular, poorly consolidated sand-----	2,360	10

Table 1.--Lithologic log of Hydrologic Test Well 1--Continued

	Depth (feet)	Thickness (feet)
Cook Mountain Limestone--Continued		
Limestone, white, finely crystalline, soft; contains tan, finely crystalline, particles of soft limestone-----	SWC-2,356	
Limestone, white, finely crystalline, soft, fossiliferous; and light-gray, fine, sub- rounded to subangular, loose sand-----	2,388	28
Limestone, white, soft, finely crystalline; contains trace of fine-grained, gray sand----	SWC-2,371	
Sparta Sand and Zilpha Clay (Top at 2,390 feet, interpreted from E-log)		
Sand, gray, poorly sorted, and light-gray limestone (poor sample)-----	2,417	29
Siltstone, light-gray, soft-----	SWC-2,414	
Siltstone, light-green, soft, slightly calcareous-----	2,500	83
Sandstone, light-gray, fine- to coarse-grained, subangular, soft, poorly consolidated-----	2,515	15
Siltstone, light-green, soft, slightly calcareous-----	2,530	15
Siltstone, dark-gray, soft, slightly calcareous-----	2,550	20
Siltstone, brown-gray, soft, slightly calcareous-----	2,565	15
Samples missing-----	2,616	51

Table 2.--Description of rotary cores from Hydrologic Test Well 1

	Thickness (feet)
Cored 1,391 to 1,411; recovered 17.29 feet	
Clay, light-gray, soft, calcareous; shell fragments, small lenses of green-gray clay. Lower 1/4 to 1 inch is clayey, fossiliferous limestone. (<u>Sorites</u>)-----	1.0
Limestone, light-gray, very finely crystalline, soft, fossiliferous, contains black <u>Sorites</u> fragments; fine-grained sand and a trace of light-gray and black, carbonaceous shale-----	1.1
Limestone, light-gray, finely crystalline, soft-----	1.9
Clay, gray and dark-gray, soft, fossiliferous (<u>Sorites</u> fragments)-----	0.08
Limestone, gray, finely crystalline, soft, fossiliferous <u>Sorites</u> ; contains crystal-lined openings. Crystals appear to be calcite-----	0.34
Limestone, light-gray, finely crystalline, slightly harder; contains <u>Sorites</u> fragments-----	0.17
Limestone, light-gray, finely crystalline, trace of gray-green clay-----	0.7
Limestone, light-gray, finely crystalline; irregular-shaped, crystal-lined openings; trace of dark-gray clay at base of core-----	2.7
Clay, black, soft; contains light-gray bands of shell fragments and very coarse, rounded sand grains-----	1.20
Clay, black, soft; with a few thin layers of shell fragments-----	2.0
Clay, brown-black, soft; with numerous layers of shell fragments-----	0.95
Clay, light-gray-brown, soft; contains shell fragments and varying amounts of dark-gray clay-----	0.25

Table 2.--Description of rotary cores from Hydrologic Test Well 1A
Continued

	Thickness (feet)
Limestone, light-gray, finely crystalline, moderately hard; upper part contains light-gray clay-----	0.70
Limestone, light-gray, finely crystalline, moderately hard; numerous shell fragments, lower 2 feet contains gray clay and is softer-----	2.5
Limestone, gray, grades to gray-green clay with shell fragments-----	1.7
Cored 2,022 to 2,042; recovered 1.1 feet	
Clay, light-greenish-gray, calcareous, soft; with black, carbonaceous particles and shell fragments-----	1.1
Cored 2,374 to 2,388; recovered 8.63 feet	
Sandstone, light-green to gray, soft, calcareous, silty; and limestone, white, finely crystalline, soft-----	0.12
Limestone, light-gray, to white, finely crystalline, soft; contains numerous, small, green particles of possibly glauconite or chlorite group minerals; and black, carbonaceous particles; fossiliferous-----	0.5
Limestone, light-gray, white, finely crystalline, soft; fossiliferous-----	0.25
Limestone, grayish-tan, finely crystalline, hard, fossiliferous-----	0.14
Limestone, gray, finely crystalline, hard, fossiliferous-----	0.64
Limestone, gray, hard, fossiliferous (bryozoa); contains black particles-----	0.70
Limestone, gray, finely crystalline, hard, fossiliferous; contains small calcite crystal-lined openings-----	0.25
Limestone, gray, finely crystalline, hard; fossiliferous; contains soft gray silt zone 1/2 inch wide-----	0.16

Table 2.--Description of rotary cores from Hydrologic Test well 1--
Continued

	Thickness (feet)
Limestone, gray, finely crystalline, hard; fossiliferous; contains black particles; calcite crystal-lined openings-----	0.2
Limestone, gray, finely crystalline, hard, fossiliferous; contains several calcite crystal-lined openings; glauconitic-----	0.92
Limestone, white, crystalline, hard, fossiliferous; contains numerous calcite crystal-lined openings; gray crystalline calcite, glauconitic-----	0.46
Limestone, white, crystalline, hard, fossiliferous; contains many openings, some lined with finely crystalline calcite; some crystalline glauconite; considerable finely crystalline pyrite concentrated in a narrow band near base. Bryozoa fragments common-----	1.25
Limestone, white, crystalline, hard, fossiliferous; contains calcite-lined openings, green glauconite and gray calcite. Bryozoa are common-----	0.62
Limestone, white, crystalline, hard, fossiliferous; contains calcite-lined openings; green glauconite and gray calcite. Bryozoa are common. Also contains large opening 3/16-inch diameter (mold) in lower part of core-----	0.58
Limestone, white, crystalline, fossiliferous; contains considerable bryozoa-----	0.92
Limestone, white, crystalline, fossiliferous; and clay, green, hard-----	0.92

Table 3.--Chemical analyses of water, in parts per million, from Hydrologic Test Well 1, Tatum Dome, Mississippi, by U.S. Geological Survey

*Aquifer	1	2	3	4	5
Silica (SiO ₂)	11	22	9.2	22	13
Iron (Fe) . . . . .	.60	1.8	.29	.11	4.4
Calcium (Ca)	5.2	6.2	14	5.4	87
Magnesium (Mg) . . . . .	.3	1.1	1.7	2.6	50
Sodium (Na)	58	8.5	126	483	7,040
Potassium (K)	1.8	2.9	3.9	7.8	117
Bicarbonate (HCO ₃)	154	32	226	613	510
Sulfate (SO ₄)	7.4	9.6	99	1.4	25
Chloride (Cl)	4.5	4.1	21	412	11,000
Fluoride (F) . . . . .	.0	.1	.9	6.0	3.0
Nitrate (NO ₃) . . . . .	.0	.0	.0	.3	.0
Dissolved solids	164	71	420	1,320	18,600
Hardness as CaCO ₃ :					
Total	14	20	42	24	422
Noncarbonate	0	0	0	0	4
Color	30	70	10	50	40
pH	8.2	6.4	7.4	8.1	7.8
Specific conductance	261	85.3	675	2,220	28,900
(micromhos at 25°C)					
Temperature (°F)	78	79	84	92	96
Date of collection	5-29-61	5-16-61	5-9-61	4-28-61	6-9-61

*Aquifer

1. Pascagoula and Hattiesburg Formations (undifferentiated), depth interval from 578 to 782 feet; perforated section, 600-650 feet.
2. Hattiesburg Formation, depth interval from 853 to 1,140 feet; perforated sections, 920-960 and 1,010-1,130 feet.
3. Catahoula Sandstone, upper part, depth interval from 1,215 to 1,310 feet; perforated section, 1,230-1,310 feet.
4. Vicksburg Group, depth interval from 1,680 to 1,902 feet; perforated section, 1,742-1,880 feet.
5. Cook Mountain Limestone (Camerina limestone), depth interval from 2,240 to 2,390 feet.

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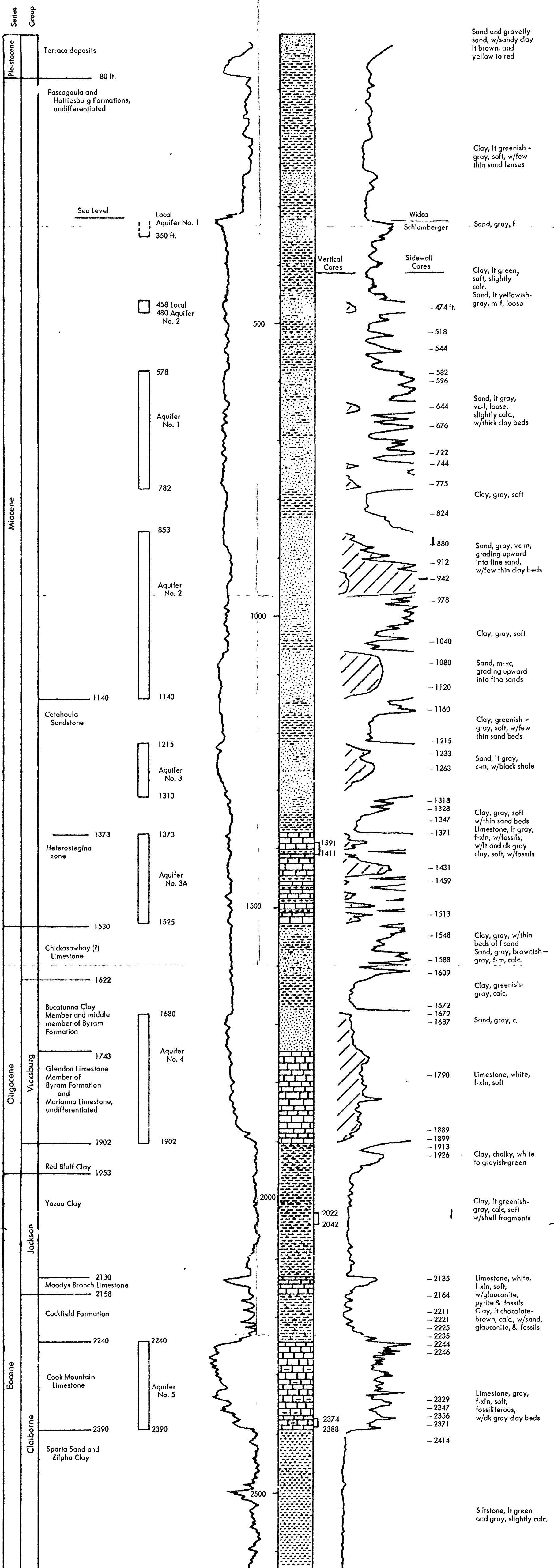


Figure 2. — Lithologic and Electrical log of Hydrologic Test Well 1, showing aquifers and cored intervals.

VERTICAL SCALE

1"=100'