GEOHYDROLOGY AND SUSCEPTIBILITY OF AQUIFERS TO SURFACE CONTAMINATION IN ALABAMA; AREA 5

by Robert E. Kidd

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CONVERSION FACTORS

For use of readers who prefer to use metric (International System) units, conversion factors for inch-pound units used in this report are listed below:

Multiply inch-pound unit	By	To obtain metric unit
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)
gallon per minute (gal/min)	0.06308	liter per second (L/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Mean Sea Datum of 1929."

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ABSTRACT

The U.S. Geological Survey, in cooperation with the Alabama Department of Environmental Management, is conducting a series of geohydrologic studies to delineate recharge areas of the major aquifers in Alabama and their susceptibility to contamination. This report delineates and describes the geohydrology and susceptibility of the aquifers to contamination in Area 5--Chambers, Clay, Cleburne, Coosa, Lee, Randolph, and Tallapoosa Counties.

Little ground water is used for public water supplies in Area 5. Ground-water withdrawals for public supply in 1985 was 0.88 million gallons per day. Most cities and towns that formerly used ground water, presently use surface water. None of the sedimentary rocks or unconsolidated deposits are tapped by public-supply wells, and none of the igneous and metamorphic rocks are considered a major aquifer because of low yields.

Aquifers in the study area are susceptible to surface contamination throughout their entire outcrop area. Areas that are highly faulted and valley areas where ground water is at or near land surface have potential to be highly susceptible to surface contamination.

INTRODUCTION

The Alabama Department of Environmental Management (ADEM) is developing a comprehensive program in Alabama to protect ground water defined by the U.S. Environmental Protection Agency (EPA) as "Class I and II" from surface contamination (U.S. Environmental Protection Agency, 1984). The U.S. Geological Survey, in cooperation with ADEM, is conducting a series of geohydrologic studies in Alabama to delineate recharge areas of the major aquifers and areas susceptible to contamination. This report summarizes these factors for aquifers in Area 5--Chambers, Clay, Cleburne, Coosa, Lee, Randolph, and Tallapoosa, Counties (fig. 1).

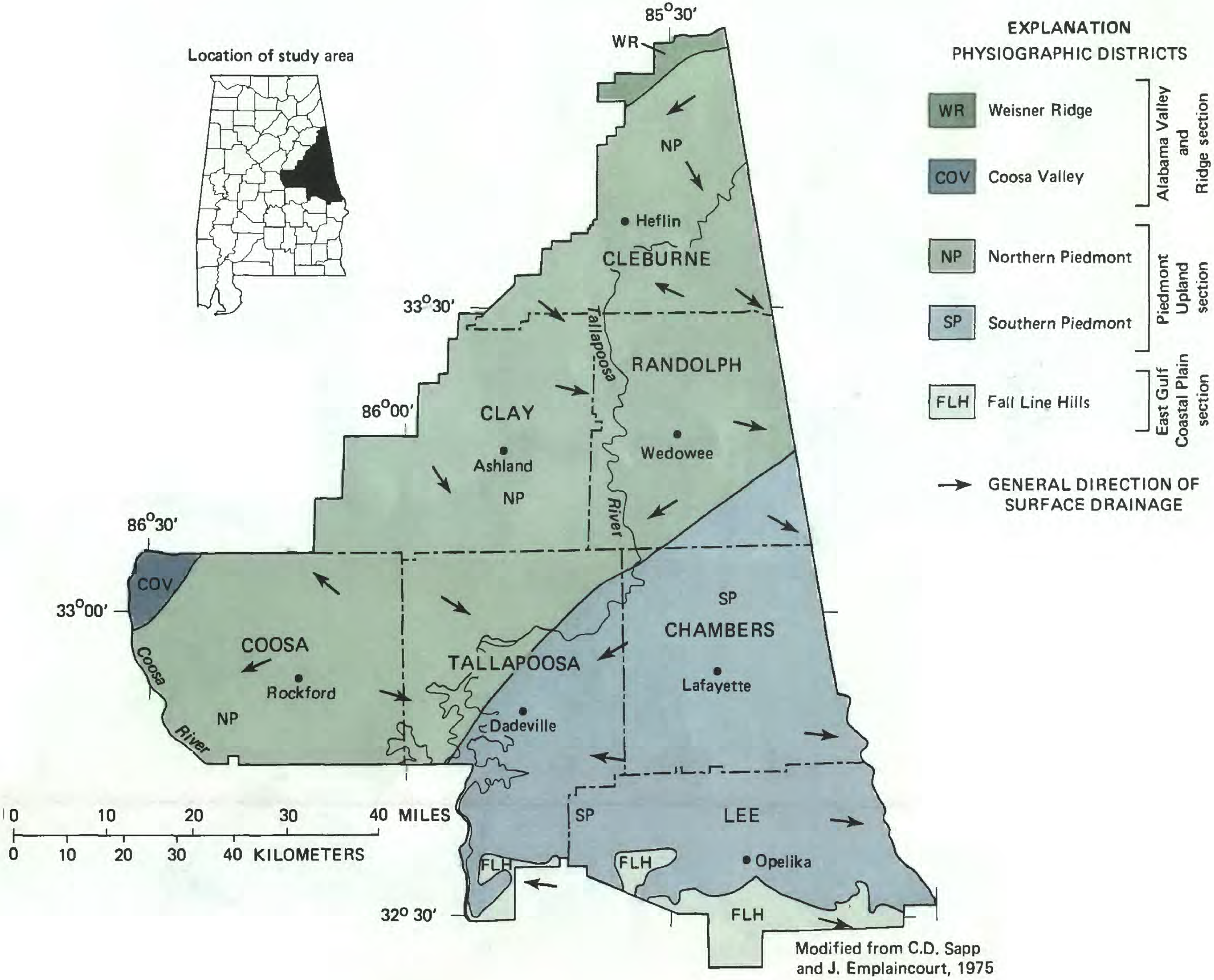


Figure 1.--Physiography and surface drainage of the study area.

Purpose and Scope

The purpose of this report is to describe the geohydrology of the major aquifers and their susceptibility to contamination from the surface. Geologic and hydrologic data compiled as part of previous investigations provided about 75 percent of the data used to evaluate the major aquifers in the area. All wells used for municipal and rural public water supplies were inventoried (table 2). Data on water use were compiled during the well inventory. Areas susceptible to contamination from the surface were delineated partly from geologic maps, topographic maps, and other available data, and partly from field investigation.

Location and Extent of the Area

The study area is in east-central Alabama and comprises an area of about 4,314 square miles (plate 1). The area includes the towns of Alexander City, Ashland, Auburn, Dadeville, Heflin, Lafayette, Lanett, Opelika, Roanoke, Rockford, Wedowee, and numerous other small towns and communities. The total population of the seven-county area was 216,857 in 1982 (Alabama Department of Economic and Community Affairs, 1984). The area is primarily rural.

Physical Features

The study area lies in parts of three physiographic provinces: Valley and Ridge, Piedmont, and Coastal Plain (fig. 1). Northernmost Cleburne County is in the Weisner Ridges district of the Alabama Valley and Ridge section of the Valley and Ridge province. The Weisner Ridges district is characterized by maturely-dissected faulted and folded quartzite mountains separated by narrow carbonate valleys. Altitudes of the valley floors generally are about 800 feet above sea level, and the mountain ridges generally range from 1,300 to 1,500 feet above sea level.

The extreme northwest corner of Coosa County is in the Coosa Valley district of the Alabama Valley and Ridge section of the Valley and Ridge province. The area is underlain by sandstone, shale, limestone, and chert. The Coosa Valley is a mature plain with little surface relief. Altitudes range from 400 to 500 feet above sea level. Surface drainage in both districts is southwestward to the Coosa River (fig. 1).

More than 90 percent of the study area is in the Piedmont Upland section of the Piedmont province. The section has been further divided into the Northern Piedmont Upland district on the northwest and the Southern Piedmont Upland district on the southeast (Sapp and Emplaincourt, 1975). The Northern Piedmont Upland district is characterized by well-dissected upland developed on metamorphosed sedimentary and igneous rocks. The land surface ranges from about 1,100 feet above sea level in north Cleburne County to about 500 feet above sea level in the south near Mitchell Lake. Talladega Mountain forms a prominent northeastward-trending ridge that includes Cheaha Mountain (2,407 feet above sea level), the highest point in Alabama (plate 1). All of Clay County, most of Cleburne, Randolph, and Coosa Counties, most of Tallapoosa County west of the Tallapoosa River, and the northwestern corner of Chambers

County are in the Northern Piedmont Upland district (fig. 1). Surface drainage in the district generally is south to the Tallapoosa River and southwest to the Coosa River (fig. 1).

There is a gradual transition in physiography from the Northern Piedmont Upland district to the Southern Piedmont Upland district. The Southern Piedmont Upland district is characterized by a rolling topography indicative of a dissected peneplain of advanced erosional maturity (Chandler and Lines, 1974). The land surface of the district ranges in altitude from about 500 to 900 feet above sea level and averages about 800 feet above sea level. Most of Chambers and Lee Counties, the southeastern part of Randolph County, and most of Tallapoosa County east of the Tallapoosa River are in this district. Surface drainage in the district generally is southwestward to the Tallapoosa River and southeastward to the Chattahoochee River.

The third physiographic province in the study area is the Coastal Plain. The Fall Line Hills district of the East Gulf Coastal Plain section is characterized by relatively flat to gently rolling uplands and broad, gently sloping valleys. The land surface ranges in altitude from about 350 to 650 feet above sea level and local relief is usually less than 100 feet. Surface drainage is south and southeastward to the Chattahoochee River, and southward and southwestward to the Tallapoosa River. The southernmost part of Lee County is in the Fall Line Hills district.

Previous Geologic and Hydrologic Studies

Henry McCalley studied and mapped the crystalline rocks of Alabama from 1901 to 1904. Adams subdivided the crystalline rocks into informal belts and formal units and these subdivisions are used in this report (Adams and others, 1926). Baker (1957) described the geology and ground water of the Piedmont area. Clarke (1963) reported on residual clays and rock weathering as related to rock types. Joiner and others (1967) and Scarbrough and others (1969) reported on using geophysical methods in prospecting for ground water in the Piedmont area.

Studies on the availability of water in each county in the study area were made by Lines and Scott (1972), Chandler and others (1972), Scott and Lines (1972), Chandler and Lines (1974, 1978a, 1978b), and Lines and Chandler (1975). Much of this report is based on data in these water availability studies. Chandler (1976) discussed the aquifers of the Piedmont and their potential yields.

Acknowledgments

Special appreciation is extended to the waterworks managers in the study area who helped locate public-supply wells and furnished information on well construction and water use.

GEOHYDROLOGY OF THE STUDY AREA

Rocks that crop out in and underlie the study area range in age from Precambrian to Holocene (Eargle, 1955; Scott and Lines, 1972). Metamorphic and igneous rocks of Precambrian to late Paleozoic age crop out in over 90 percent of the study area (fig. 2). Sedimentary rocks of Paleozoic age crop out in the northernmost part of the study area in northern Cleburne County and in the northwestern corner of Coosa County. Unconsolidated sediments of Late Cretaceous age crop out in the southernmost part of the study area in southern Lee County. Quaternary alluvial deposits occur along major streams throughout the study area.

Igneous and Metamorphic Rocks of Precambrian to Late Paleozoic Age

Most of the study area is underlain by igneous and metamorphic rocks, whose age, structure, and stratigraphic relations are not well understood. Therefore, the description of these rocks does not reflect age or stratigraphic position. The units are described in descending order as listed in figure 2. These rocks are part of the continental basement (Clarke, 1963). Adams (1926) originally defined the stratigraphy by grouping the rocks into informal metamorphic belts and formal units. Many of the rocks have been regrouped and renamed during recent mapping by the Geological Survey of Alabama based on structure, mineral, and texture variations. Most of the recent mapping is unpublished at this writing and, for ease of discussion, the divisions given by Adams are used.

There are several major faults and lines of metamorphic discontinuity that cut the metamorphic units described by Adams (Neathery and Tull, 1975). The Talladega and Crooked Creek faults separate the Piedmont from the Valley and Ridge province (plate 1). The Goodwater fault separates the Ashland Mica Schist from the Wedowee Formation in northwestern Coosa County. The Parkdale fault in southwestern Clay County and northeastern Coosa County and the Shady Grove fault in Clay County are transverse faults. The Alexander City and the Omaha faults may be one large fault system that in part separates the Ashland Mica Schist and the Wedowee Formation.

Two major metamorphic discontinuities or faults are the Hollins Line and the Enitachopco Line (Neathery and Tull, 1975). Both structures are interpreted as major structural discontinuities resulting from the movement of one grade of metamorphic rock over another.

Three major fault zones occur in the southern half of the study area. The Brevard and Goat Rock faults dip southeast. The Towaliga fault dips northwest.

The rocks in Area 5 are predominantly clastic sediments that have been altered by several stages of regional metamorphism to slate, schist, phyllite, gneiss, and marble. In some areas, these rocks have been intruded by igneous rocks. Ages ranging from Precambrian to late Paleozoic have been assigned to the rocks (Deininger and others, 1964).

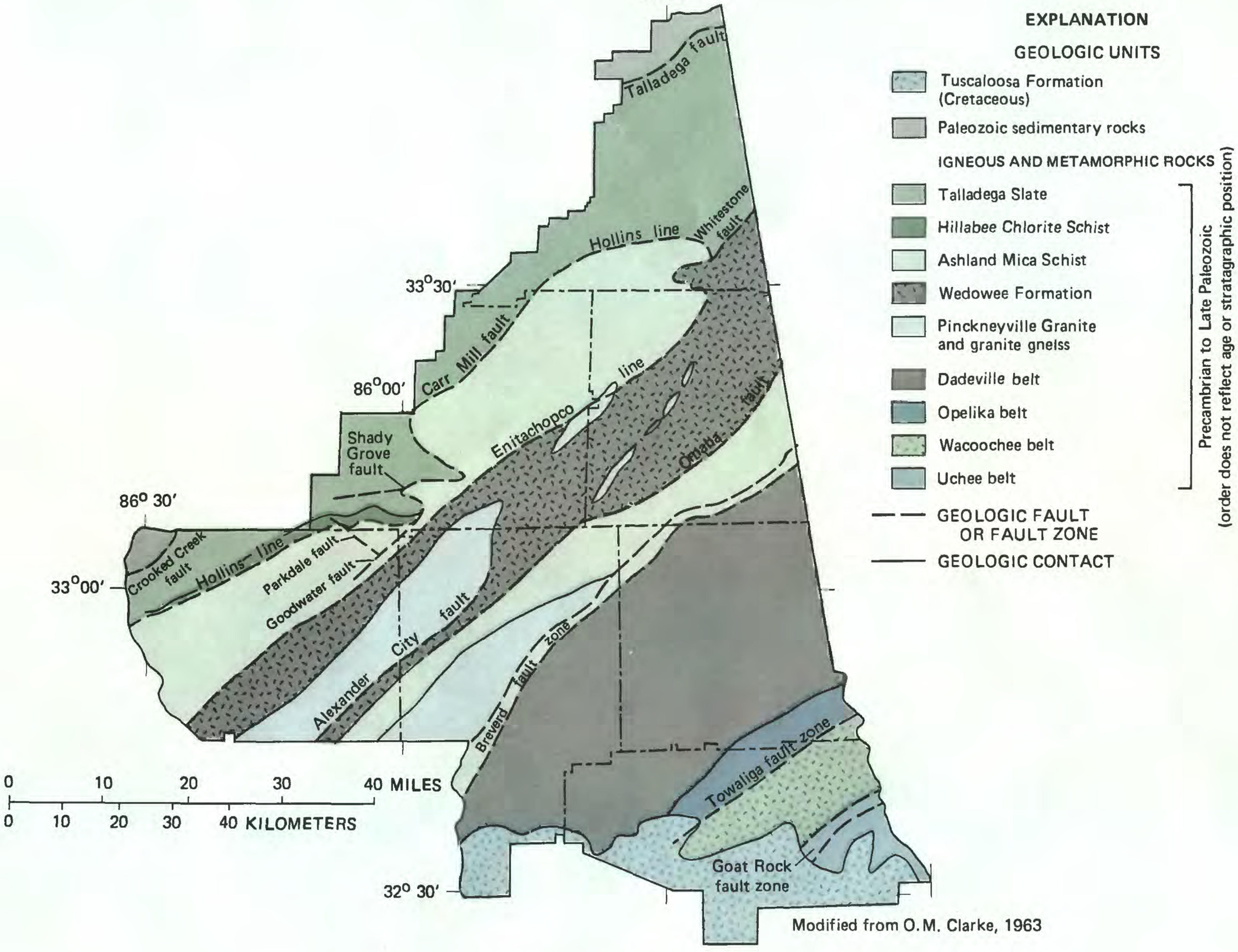


Figure 2.--Generalized geology of the study area.

Erosion has exposed bedrock in some areas, but deep and erratic weathering of the igneous and metamorphic rocks extends 50 to 100 feet below land surface in most of the study area. The term "saprolite" is used to refer to decomposed untransported material that has weathered from the bedrock and which retains some of the characteristics of the original material.

Previous studies indicate that primary porosity in the metamorphic rocks generally is less than 1 percent and saprolite porosities may be from 40 to 50 percent (Nutter and Otten, 1969; Chandler, 1976). The basal saprolites generally are the most productive aquifers. However, they generally are separated by surface drainage divides and are not hydraulically interconnected with adjacent basins.

The average yield from wells that tap the igneous and metamorphic rocks is about 19 gal/min (gallons per minute) (Chandler, 1976). Less than 10 percent yield 50 gal/min or more (table 1). Little ground water is used for public water supplies in Area 5. Most cities and towns that formerly used ground water, presently use surface water. Consequently, none of the rocks in the study area are considered major aquifers.

Talladega Slate

The Talladega Slate crops out between the Talladega and Crooked Creek faults and the Hollins line, and extends from Cleburne County in the northeast through western Clay County to Coosa County in the southwest (fig. 2). This complex of low-rank metamorphosed sediments forms a continuous belt 8 to 22 miles wide that strikes northeastward. The Talladega Slate consists predominantly of slate and phyllite with some marble, dolomite, and quartzite. The phyllites are strongly schistose and consist of about 50 percent quartz with variable amounts of feldspar, chlorite, muscovite, and epidote. Foliations in the rocks generally dip southeastward at angles of 30 to 60 degrees (Chandler and Lines, 1978b). The average thickness of saprolite overlying the slate is from about 20 feet on hilltops and hillsides to about 35 feet in draws and valleys.

Public supply wells completed in the Talladega Slate range from 100 to 540 feet in depth and yield less than 30 gal/min (table 1). Fruithurst in Cleburne County is the only town in the study area to obtain a public water supply from the Talladega (plate 1). Two wells at Fruithurst produce 20 and 25 gal/min from depths of 352 and 350 feet below land surface (table 2).

Hillabee Chlorite Schist

The Hillabee Chlorite Schist crops out southeast of the Talladega Slate (fig. 2). The Hillabee is a sinuous belt of chlorite-epidote-hornblende schist which extends from southeastern Cleburne County southwestward through Clay and Coosa Counties. Part of the outcrop is coincident with the trace of the Hollins line in Cleburne, Clay, and Coosa Counties (Deininger and others, 1964). The Hillabee averages less than one-quarter mile in outcrop width. Locally the strike varies by nearly 90 degrees from its general northeast-southwest direction and the rocks generally dip southeast at about 40 degrees (Prouty, 1923).

The Hillabee has been used as a source of water in the past (Baker, 1957), but presently is not used as a public water-supply source in the study area because of small yields. Well yields are generally less than 10 gal/min.

Ashland Mica Schist

The Ashland Mica Schist crops out in two belts about 4 to 15 miles in width and strikes northeastward across the central part of Area 5 (fig. 2). Foliations generally dip southeastward from 30 to 65 degrees (Chandler and others, 1972).

The rocks that compose the Ashland include muscovite and quartz-muscovite schists with some graphite, hornblende schist and gneiss, chlorite schist, granitic gneiss, and biotite augen gneiss (Deininger and others, 1964). The average thickness of saprolite is about 50 feet.

Public water supplies for the towns of Lineville and Ashland were formerly obtained from the formation (table 2). These towns presently use surface water for their supplies. The town of Wadley currently obtains its water supply from the Ashland Mica Schist.

Public supply wells completed in the Ashland range from 100 to 340 feet in depth and generally yield from 10 to 15 gal/min. However, yields of more than 50 gal/min are obtained from some wells.

Wedowee Formation

The Wedowee Formation crops out in two northeastward trending belts extending from southern Coosa County across northwest Tallapoosa, southeastern Clay, central Randolph Counties, and into southeastern Cleburne County (fig. 2). Foliations in the rocks generally dip southeastward 45 to 90 degrees. The formation is a phyllite with some beds of micaceous quartzite. The phyllite contains finely crystalline graphite as a minor constituent. The rocks of the Wedowee have been partly replaced by granites (Deininger and others, 1964). The phyllite adjacent to the granites have been metamorphosed to quartz-mica schist. Saprolite thickness of 50 feet or more is common on upland draws and on concave slopes adjacent to streams (Lines and Chandler, 1975).

Yields to wells that tap the formation generally are about 15 gal/min. However, yields greater than 50 gal/min were reported. Depth of wells range from about 100 to 350 feet. The Wedowee Formation is the source of water for the towns of Woodland and Wedowee.

Pinckneyville Granite and Granite Gneiss

The Pinckneyville Granite, the largest granitic mass in Alabama, is 6 to 10 miles wide and 40 miles long (Clarke, 1963). The outcrop of the Pinckneyville trends northeast from south-central Coosa County and northwestern Tallapoosa County to the southern part of Clay County. Related granitic intrusions occur along the projection of the formation into Clay and Randolph

Counties (fig. 2). The granite consists of microcline, orthoclase, plagioclase, quartz, and muscovite, with minor amounts of biotite and epidote. Saprolite ranges in thickness from 10 to 50 feet.

Wells completed in the Pinckneyville range from less than 100 to over 500 feet in depth. The town of Rockford formerly obtained water from two wells that produced 15 and 33 gal/min from depths of 237 and 300 feet (table 2). Rockford presently obtains water from Alexander City, which obtains water from surface water sources.

A belt of granitic gneiss crops out about 5 miles southeast of the Pinckneyville Granite. The granitic gneiss extends from southwestern Tallapoosa County northeastward in a narrowing belt into northeast Tallapoosa County. No public water supply wells tap this belt.

Dadeville Belt

The Dadeville belt crops out in southeastern Tallapoosa and northwestern Lee Counties and trends northeast across Chambers County into the southeastern corner of Randolph County (fig. 2). Foliation planes of the rocks generally dip southeastward 30 to 60 degrees (Chandler and Lines, 1974). The Dadeville belt consists primarily of mica gneiss and schist with some hornblende gneiss. The mica gneiss contains scattered feldspathic porphyroblasts and feldspathic bands. The hornblende gneiss may be sills or could be metamorphosed sediments (Deininger and others, 1964). The Dadeville belt contains scattered granitic outcrops. A series of ultramafic rocks have intruded the mica and hornblende gneisses in some areas.

The average thickness of saprolite is about 50 feet. Wells developed in saturated saprolite may yield as much as 50 gal/min, but generally less than 10 gal/min. Well depths generally range from 35 to 500 feet.

The Dadeville belt is tapped by many wells for use at recreation sites, schools, and camps, but is not used as a municipal water supply owing to the small yields (table 2).

Opelika Belt

The Opelika belt crops out immediately to the southeast of the Dadeville belt and is about 5 to 6 miles wide. The rocks extend from near Loachapoka in western Lee County northeast to near Shawmut in eastern Chambers County (fig. 2). These rocks consist primarily of biotite gneiss and augen gneiss with some granite gneiss and migmatites in southeastern Chambers County. Diabase dikes cut across the belt about 2.5 miles northeast of Auburn (Deininger and others, 1964).

Rocks in the Opelika belt do not yield sufficient quantities of water for public supplies, but do supply water to some domestic wells.

Wacoochee Belt

The rocks of the Wacoochee belt crop out southeast of the Opelika belt in Lee County (fig. 2). This belt is about 10 miles wide and trends northeastward. Foliation planes of the metamorphic rocks dip southeastward. These rocks consist predominantly of garnetiferous-biotite schist and quartz-muscovite schist with some granite gneiss, biotite augen gneiss, quartzite, marble and dolomite. The thickness of the saprolite ranges from 10 to 200 feet and averages about 50 feet.

Wells generally yield less than 25 gal/min. One well that taps rocks of the Wacoochee belt yields more than 2,000 gal/min (Scott and Lines, 1972). This well may penetrate either solution cavities in dolomite or large fractures in quartzite. Well depths range from about 150 to 300 feet. The towns of Auburn, Smiths, and Beauregard have wells completed in rocks of the Wacoochee belt. A spring that discharges from the Wacoochee unit is used for an emergency water supply for Opelika. Auburn and Opelika use surface water as their principal source of water supply.

Uchee Belt

The rocks of the Uchee belt crop out in Lee County southeast of the Wacoochee belt (fig. 2). These rocks are predominantly biotite and hornblende gneiss and granite gneiss. The granitic gneiss is commonly mylonitized and may be associated with the Goat Rock fault (Deininger and others, 1964). No public supply wells tap the rocks of the Uchee belt.

Sedimentary Rocks of Paleozoic Age

Paleozoic rocks of Cambrian age crop out northwest of the Talladega fault in northernmost Cleburne County (fig. 2). The Weisner Formation, owing to its hardness and resistance to erosion, forms ridges. The Weisner consists of quartzite, sandstone, conglomerate, and sandy shale. The Shady Dolomite overlies the Weisner Formation and crops out in several narrow bands. The Shady consists of fine-grained medium- to thick-bedded limestone and dolomite. The Weisner and Shady are not tapped by any public-supply wells.

The Newala Limestone of Ordovician age and the Floyd Shale and Parkwood Formation of Mississippian age crop out northwest of the Crooked Creek fault in the extreme northwest corner of Coosa County (plate 1). The Newala consists of micritic limestone and dolomite. The Floyd Shale is dark gray shale with rare interbeds of argillaceous limestone. The Parkwood Formation consists of interbedded shale and fine-grained, argillaceous sandstone. None of these sedimentary rocks are tapped for public water supply in Coosa County.

Sedimentary Deposits of Cretaceous Age

Deposits of the Tuscaloosa Formation of Late Cretaceous age are exposed in the southernmost part of the study area in southern Tallapoosa and Lee Counties (fig. 2). The Tuscaloosa Formation unconformably overlies the pre-Cretaceous igneous and metamorphic rocks. The Tuscaloosa consists of deltaic or nonmarine clay, sand, and gravel. The sediments are poorly sorted and commonly contain weathered feldspar grains of silt size. The Tuscaloosa dips south-southeastward about 30 to 50 feet per mile.

Wells that penetrate sand and gravel beds of the Tuscaloosa Formation generally yield less than 10 gal/min and the formation is not considered a major aquifer in Area 5. The Tuscaloosa Formation is a major aquifer south of the study area and the outcrop in Area 5 is part of the recharge area for the aquifer downdip (plate 1).

Sedimentary Deposits of Quaternary Age

Quaternary alluvial deposits overlie older formations along major streams throughout the study area. These deposits are not shown on the geologic map (fig. 2). The alluvium is irregularly stratified, locally derived fluvial sediments consisting of clay, silt, sand and pebbles with locally abundant cobbles, boulders, and heavy minerals.

The alluvial deposits provide recharge to the underlying igneous and metamorphic rocks. These deposits are relatively unimportant as sources of ground-water supply because of their limited areal extent, and are not tapped by any public-supply well in the study area (Chandler, 1976).

HYDROLOGY OF THE AQUIFERS

The following discussion of the hydrology of the aquifers is limited to the water-bearing igneous and metamorphic rocks. None of the sedimentary rocks or unconsolidated deposits are tapped by public supply wells in the study area. None of the igneous and metamorphic rocks in the study area are considered a major aquifer because of small yields. Surface drainage divides of the igneous and metamorphic rocks generally correspond to the boundaries of aquifers that generally are not hydraulically interconnected. Recharge areas are coincident with outcrop areas of the aquifers. Recharge areas for the aquifers and areas where the aquifers are susceptible to surface contamination are shown on plate 1. Also shown on plate 1 are locations of public water-supply wells. Construction of wells, water levels, and other pertinent well data are given in table 2.

Recharge and Movement of Ground Water

The source of recharge to the aquifers is precipitation, mostly rain supplemented by occasional snow. Average annual precipitation is about 52 inches per year, but a large part runs off during and directly after rainstorms (Chandler, 1976). Most of the remainder is returned to the atmosphere by evaporation and transpiration of trees and other plants; a small part infiltrates to the water table to recharge aquifers. Chandler (1976) estimated that recharge to aquifers in the study area is about 6 inches per year.

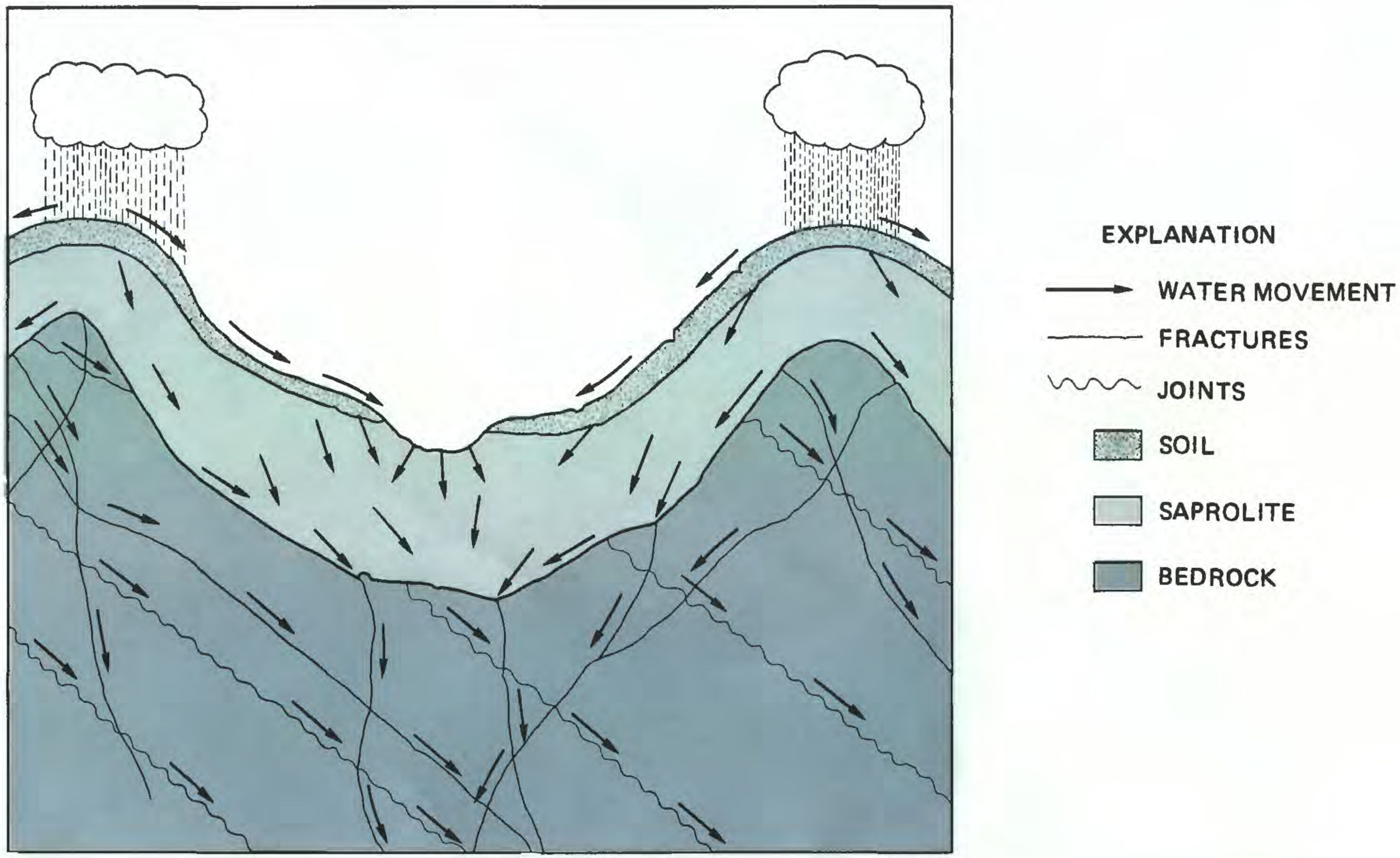
The movement of ground water in the aquifers is controlled by several factors: topography; the character and thickness of the saprolite; and the number, size, and pattern of fractures in crystalline rock that underlie the saprolite. The direction of ground-water movement is controlled mainly by topography. Movement generally is from hilltops and uplands to stream valleys. The water table generally conforms to topography, but has less relief. The water table generally is 30 to 100 feet below land surface on hilltops and hillsides, but is at or near land surface in stream valleys and draws.

The saprolite acts as a sponge absorbing water from rainfall and runoff, feeding it steadily below to fractures in the bedrock. The importance of the saprolite as a ground-water reservoir depends mostly on its thickness. Saprolite generally is thickest in draws, valleys, and flat uplands underlain by marble, schist, or gneiss; and it is generally thinnest on ridges and hilltops underlain by quartzite or granite (Scott and Lines, 1972). Under a given set of conditions, the depth of weathering increases with the solubility of rocks. The carbonate rocks of the Wacoochee belt generally have the thickest saprolite that overlie bedrock.

Fractures in rock generally decrease in size and in number with depth, and interconnecting fractures rarely occur at depths greater than 200 feet (Lines and Scott, 1972). The fractures in the bedrock of the aquifer may be joints, openings along planes of schistosity, or other openings such as fault planes or fault zones. The dip of the schistosity controls the direction of seepage and the degree and depth of weathering. Most fractures in the study area are steeply dipping to vertical and generally have definite alignments. The fractures in the bedrock, enlarged by weathering and solution, are probably the avenues along which the greatest amounts of ground water move in the aquifers.

Figure 3 shows schematically the general ground-water movement in the study area. Rain that seeps into the ground moves downward through the soil. After the soil moisture requirements have been met, the water moves downward to the water table and then laterally to discharge points or down gradient. If the water table is within the saprolite, water moves laterally along the top of bedrock until it intersects fractures and moves deeper or to discharge points. The path from recharge to discharge areas may be direct or circuitous, depending on the pattern of fractures or solution features.

Recharge to the aquifers may also occur from movement of surface water into the aquifers as a result of pumpage. Under natural conditions, ground water in an aquifer discharges to streams and lakes. Withdrawal of water from a well intercepts some of this ground-water discharge. If pumpage of aquifers that are hydraulically connected to streams or lakes reduces the head in the aquifer below the level of the water surface, induced recharge will occur. The amount of water that can be induced into the aquifer depends on the permeability of the streambed, the degree of hydraulic connection between river and aquifer, the transmissivity of the aquifer, and the hydraulic gradient created by the pumped well.



Modified from W. L. Scarbrough and others, 1969

Figure 3.--Schematic diagram showing general occurrence and movement of ground water in crystalline rocks in the Piedmont area.

Natural Discharge and Ground-Water Withdrawals

Discharge from the aquifers occurs as seeps and springs at land surface that provide base flow to streams, and as withdrawals from wells. The small areal extent of aquifers and the limited depth of ground-water circulation result in relatively rapid movement of ground water from areas of recharge to areas of discharge.

Little ground water is used for public water supplies in Area 5. Many cities and towns in the area that formerly used ground water use surface-water sources because of the limited amount of ground water production from wells, and because of water-quality problems associated with ground water in the area.

Ground-water withdrawals in million gallons per day (Mgal/d) for public water systems in the study area in 1985 by county were: Chambers, 0.00; Clay, 0.00; Cleburne, 0.03; Coosa, 0.04; Lee, 0.55; Randolph, 0.25; and Tallapoosa, 0.01. Ground water is also used for domestic, stock, industrial, and irrigation purposes. The total amount of ground water used for public supply in the study area was 0.88 Mgal/d in 1985. The total withdrawals of ground water for all uses in the study area in 1985 were estimated to be about 8.6 Mgal/d (Baker and Mooty, 1987).

Effects of Withdrawals from the Aquifers

Large long-term withdrawals of water from the aquifers may result in the formation of depressions on the potentiometric surfaces of the aquifers. There are no known extensive depressions on the potentiometric surfaces of the aquifers in Area 5. Depressions on the water surfaces in aquifers caused by pumpage could induce recharge by vertical leakage from overlying saturated zones. Recharge could also be induced by pumpage in areas along major rivers where aquifers are hydraulically connected to streams.

SUSCEPTIBILITY OF THE AQUIFERS TO SURFACE CONTAMINATION

The potential for aquifer contamination exists in all of the aquifers in Area 5. Sources of contamination may be point sources, such as leaking waste ponds, or nonpoint sources, such as heavily treated agricultural areas. Areas that have potential for surface contamination are categorized by areas that are susceptible and highly susceptible (plate 1). Some general comments concerning the fate of any contaminants that enter the ground-water system can also be made.

The aquifers in the study area are recharged throughout their outcrop and any contaminants present in the recharge area of an aquifer may enter that aquifer (plate 1). Consequently, the aquifers are susceptible to contamination throughout their entire outcrop area. Susceptibility is least in areas where there are thick soils and saprolite, which serve as natural filters that prevent or retard the entrance of contaminants into the water-bearing rocks.

Certain topographic settings that are highly susceptible to contamination from the surface can generally be described. Examples of this type of setting in the study area include valleys and lowlands where the water table is at or near land surface. These areas are highly susceptible to contamination because of the small vertical distance between the land surface and the aquifer. It is beyond the scope of this report to delineate these areas, however, their presence can be determined through field inspection and 7.5 minute topographic maps.

Areas that are faulted have potential to be highly susceptible to contamination from the surface. Fault zones or faults may be extremely transmissive and, where they crop out, may be sites of increased recharge. Most of the major faults in the study area have been mapped and are shown on plate 1. It is likely, however, that many additional unmapped minor faults are present in the study area.

SUMMARY AND CONCLUSIONS

Metamorphic and igneous rocks crop out in over 90 percent of the study area. Sedimentary rocks crop out in northern Cleburne and northwestern Coosa Counties. Unconsolidated sediments of the Tuscaloosa Formation crop out in southern Lee County. Quaternary age alluvial deposits occur along major streams throughout the study area.

Very little ground water is used for public water supplies in Area 5. None of the sedimentary rocks or unconsolidated deposits are tapped by public supply wells. None of the igneous and metamorphic rocks are considered a major aquifer because of low yields and hydraulic independence. Surface-drainage divides of the igneous and metamorphic rocks generally correspond to separate ground-water reservoirs.

Areas which have potential for surface contamination are categorized into areas that are susceptible and highly susceptible. Aquifers are susceptible to contamination throughout their entire outcrop areas. Areas that are faulted have potential to be highly susceptible. Also, valleys where water levels are at or near land surface are highly susceptible to contamination from the surface.

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Table 1.--Generalized section of geologic units and their water-bearing properties

Geologic unit	Lithology	Water-bearing properties
Quaternary alluvial deposits	Sand, poorly sorted; clay; silt; and gravel	Not tapped by any public-supply well in the study area. Limited areal extent.
Tuscaloosa Formation (Cretaceous)	Poorly sorted clay, sand, and gravel	Generally yields less than 10 gal/min. A major aquifer south of Area 5.
Paleozoic sedimentary rocks	Quartzite, sandstone, conglomerate, shale, limestone, dolomite	Not tapped by any public-supply wells in the study area.
Precambrian to late Paleozoic igneous and metamorphic rocks (order does not reflect age or stratigraphic position)		
Talladega Slate	Slate, phyllite, marble, dolomite	Yields less than 30 gal/min.
Hillabee Chlorite schist	Chlorite-epidote-hornblende schist	Small yields. Not used as a public water-supply source.
Ashland Mica Schist	Muscovite and quartz-muscovite schists	Generally yields 10 to 15 gal/min.
Wedowee Formation	Phyllite, micaceous quartzite	Yields 15 gal/min; yields greater than 50 gal/min reported.
Pinckneyville Granite and granite gneiss	Granite and granite gneiss	Yields 15-30 gal/min. Not used as public water-supply source.
Dadeville belt	Mica gneiss and schist, hornblende gneiss, granite	Generally yields less than 10 gal/min.
Opelika belt	Biotite gneiss, augen gneiss, granite gneiss, migmatites	Insufficient yields for public supplies.
Wacoochee belt	Garnetiferous-biotite schist, quartz-muscovite schist, marble, dolomite	Generally yields less than 25 gal/min. Yield more than 2,000 gal/min reported.
Uchee belt	Biotite and hornblende gneiss and granite gneiss	Not tapped by any public-supply wells.

Table 2.--Records of public water-supply wells in the study area

NOTE: Well numbers correspond to those shown on plate 1.

Geographic coordinate number: Lat (DDMMSS) Long (DDMMSS) sequential number (xx).

Depth of well and water level: Depth of well given in feet; reported water levels are in feet above (-) or below land surface; measured water levels are in feet and tenths.

Well diameter: casing diameter in inches.

Water-bearing unit: TS, Talladega Slate; AMS, Ashland Mica Schist; WF, Wedowee Formation; PG, Pinckneyville Granite and granite gneiss; DB, Dadeville belt; WB, Wacoochee belt.

Altitude of land surface: Altitudes given in feet above sea level, from topographic map or determined by aneroid barometer; altitudes given in feet and tenths determined by instrumental leveling.

Method of lift: N, none; S, submergible; T, turbine; J, jet.

Use of well: N, none; P, public water supply.

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
1	334459085332301	U.S. Forest Service	Graves 1966	235	6	TS	1,180	55	1966	S	P	Coleman Lake well. Casing 6 in.: 0 to 45 ft.
2	334329085361001	U.S. Dept. of Agri-culture	C.D. Pace 1962	104	6	TS	950	--	--	-	P	Pine Glenn well. Casing 6 in.: 0 to 40 ft.
3	334329085360701	U.S. Dept. of Agri-culture	C.D. Pace 1962	100	6	TS	949	--	--	-	P	Pine Glenn well. Casing 6 in.: 0 to 45 ft.
4	334340085261001	Town of Fruit-hurst	Adams-Massey 1968	350	6	TS	1,075	22	1968	S	P	25 gal/min. Casing 6 in.: 0 to 63 ft.
5	334340085255201	Town of Fruit-hurst	Adams-Massey 1968	352	6	TS	1,042	4	1968	S	P	20 gal/min. Casing 6 in.: 0 to 48 ft.
6	333850085355001	Town of Heflin	All Purpose Boring 1968	400	6	TS	926	22	1968	S	N	Well no. 8. 81 gal/min. Casing 6 in.: 0 to 64 ft.
7	333856085351801	Town of Heflin	H.W. Deerman 1934	355	6	TS	984	60	1954	S	N	Well no. 1. 22 gal/min. Casing 6 in.: 0 to 60 ft.
8	333800085351801	Town of Heflin	C.D. Pace 1939	230	8	TS	891	20	1969	S	N	Well no. 2. 60 gal/min. Casing 6 in.: 0 to 60 ft.
9	333856085343601	Town of Heflin	Adams-Massey 1958	223	6	TS	941	2.8	9-26-58	S	N	Well no. 6. 75 gal/min. Casing 6 in.: 0 to 22 ft.
10	333851085341801	Cleburne County School	All Purpose Drilling 1959	180	6	TS	1,015	45	1959	S	N	

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
11	333845085345601	Town of Heflin	Adams-Massey 1958	228	6	TS	906	22	1958	S	N	Well no. 5. 100 gal/min. Casing 6 in.: 0 to 26 ft.
12	333815085350201	Town of Heflin	C.D. Pace 1935	194	6	TS	965	50	1945	T	N	Well no. 3. 77 gal/min. Casing 6 in.: 0 to 66 ft.
13	333836085350101	Town of Heflin	C.D. Pace 1955	162	8	TS	900	30	1955	T	N	Well no. 4. 65 gal/min. Casing 6 in.: 0 to 70 ft.
14	333825085362201	Town of Heflin	Adams-Massey 1958	328	6	TS	863	6.21	1-27-87	S	N	Well no. 7. 30 gal/min. Casing 6 in.: 0 to 50 ft.
15	333713085354601	Huddle House Rest.	--	--	-	TS	905	--	--	S	P	
16	334009085220601	Alabama Highway Dept.	Alabama Highway Dept. 1978	115	6 4	WF	1,010	34.16	1-28-87	S	P	Supply well for Welcome Center, I-20. Casing 6 in.: 0 to 60 ft; 4 in.: 0 to 65 ft.
17	333549085265601	Cleburne County Vocational School	--	--	6	TS	1,040	55.67	1-27-87	S	P	
18	333413085361601	Tyson Foods	--	300	--	AMS	830	--	--	S	P	River well
19	333407085362001	Tyson Foods	C.D. Pace 1956	308	10 6	AMS	820	--	--	S	P	Well no. 1. Casing 10 in.: 0 to 55 ft.
20	333356085360501	Tyson Foods	Adams-Massey 1969	215	10 6	AMS	825	5	1-05-70	S	P	Thrower's Bottom well. Casing 10 in.: 0 to 21 ft.
21	333146085401801	Boy Scouts of America	--	--	--	AMS	920	--	--	-	P	Camp Sequoah
22	333122085380701	Pleasant Grove School	Mack Otwell 1957	200	6	AMS	901	43.47	1-27-87	S	P	
23	333130085211201	Town of Ranburne	Adams-Massey 1966	200	6	WF	936	21.6	6-02-70	S	N	Well no. 1. 34 gal/min. Casing 6 in.: 0 to 20 ft.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
24	333130085211001	Town of Ranburne	Adams-Massey	120	6	WF	934	7	1966	S	N	Well no. 6. 9 gal/min. Casing 6 in.: 0 to 12 ft.
25	332923085483701	Alabama Dept. of Conservation	H.W. Peerson 1970	345	9 5	TS	2,275	62.0	1-19-71	S	P	Well no. 2. State Park. Casing 9 in.: 0 to 40 ft.
26	332928085482501	Alabama Dept. of Conservation	H.W. Peerson 1970	269	9 5	TS	2,150	39.4	10-20-70	S	P	Well no. 1. State Park. Casing 9 in.: 0 to 40 ft.
27	332907085483401	Alabama Dept. of Conservation	Graves 1984	520	--	TS	2,400	--	--	S	P	Well no. 7. State Park.
28	332905085482801	Alabama Dept. of Conservation	Graves 1984	540	--	TS	2,350	--	--	S	P	Well no. 8. State Park.
29	332829085492301	Alabama Dept. of Conservation	--	--	-	TS	1,290	9.72	1-26-87	-	N	Cheaha Lake well.
30	332833085483501	Alabama Dept. of Conservation	H.W. Peerson 1970	383	9 5	TS	2,030	13.7	1-26-71	S	P	Well no. 3. State Park. Casing 9 in.: 0 to 21 ft.
31	332816085490501	Alabama Dept. of Conservation	--	--	-	TS	1,390	--	--	-	N	Well no. 6. State Park.
32	332816085490502	Alabama Dept. of Conservation	--	--	-	TS	1,390	--	--	-	P	Spring - State Park.
33	332705085325501	Folsom School	J.W. Woods 1949	190	6	AMS	1,244	54.8	4-03-70	-	P	School now leased by sewing factory.
34	332134085430901	Barfield School	Graves 1947	140	6	AMS	1,010	36.4	2-18-68	S	P	Casing 6 in.: 0 to 82 ft.
35	332206085292301	Lakeside Service	Ballard	110	6	WF	810	--	--	S	P	
36	332212085241601	Woodland	Ballard and Son 1966	101	6	WF	1,012	6	1966	T	P	62 gal/min. Casing 6 in.: 0 to 25 ft.
37	332127085301801	Aaron Meadows	Ballard	--	--	WF	800	--	--	S	P	Piney Wood Lake Service.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
38	331832085451801	Town of Lineville	Carl Pace 1951	150	6	AMS	1,025	43.8	12-13-68	T	N	Casing 6 in.: 0 to 70 ft.
39	331833085451901	Town of Lineville	Carl Pace 1949	110	8	AMS	1,025	47.8	12-13-68	S	N	
40	331837085452501	Town of Lineville	Adams-Massey 1961	200	6	AMS	1,026	4.04	1-30-87	T	N	Casing 6 in.: 0 to 61 ft.
41	331848085291201	Wedowee	Carlisle and Ballard 1956	116	6	WF	862	50	1956	S	P	Well no. 4. 25 gal/min. Casing 6 in.: 0 to 16 ft.
42	331833085291501	Wedowee	Carlisle and Ballard 1956	109	6	WF	852	1.0	3-31-70	S	P	Well no. 5. 45 gal/min. Casing 6 in.: 0 to 21 ft.
43	331827085291501	Wedowee	C.D. Pace 1945	340	8	WF	880	30.60	1-29-87	N	N	Well no. 2. 40 gal/min. Casing 8 in.: 0 to 60 ft.
44	331836085291601	Wedowee	H.W. Peerson 1936	325	6	WF	906	143.5	3-31-70	N	N	Well no. 1. 30 gal/min. Casing 6 in.: 0 to 150 ft.
45	331828085285401	Wedowee	Ballard and Son 1966	93	6	WF	810	19.4	3-31-70	S	P	Well no. 3. 65 gal/min. Casing 6 in.: 0 to 35 ft.
46	331653085245301	Woodland	Ballard and Son 1972	250	6	WF	943	+1.22	1-08-72	S	P	Well no. 2. Casing 6 in.: 0 to 20 ft
47	331651085501801	Town of Ashland	Carl Pace 1954	206	6	AMS	1,063	--	--	T	N	Casing 6 in.: 0 to 55 ft.
48	331651085501401	Town of Ashland	--	--	-	AMS	1,060	--	--	-	N	Swimming pool well.
49	331616085505401	Town of Ashland	Graves 1965	200	8	AMS	1,064	40.3	12-13-68	S	N	Gaither well. Casing 8 in.: 0 to 52 ft.
50	331607085505701	Town of Ashland	Graves 1970	220	8	AMS	1,060	16	7-13-70	S	N	Gaither well. Casing 8 in.: 0 to 90 ft.
51	331551085500301	Town of Ashland	Carl Pace 1947	215	8	AMS	1,049	15	1968	S	N	Tate well. Casing 8 in.: 0 to 71 ft.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
52	331622085493201	Town of Ashland	Carl Pace 1960	302	8	AMS	1,068	19.0	10-06-69	T	N	Casing 8 in.: 0 to 92 ft.
53	331601085492401	Town of Ashland	Carl Pace 1959	255	8	AMS	1,030	2.64	1-29-87	N	N	Curlee well. Casing 8 in.: 0 to 39 ft.
54	331542085494801	Town of Ashland	--	--	-	AMS	1,110	--	--	-	N	Noland well.
55	331103085444001	Mellow Valley High School	--	--	6	WF	935	6.48	1-29-87	S	P	
56	330722085343501	Wadley	Graves 1968	160	6	AMS	654	3.5	3-31-70	N	P	Well no. 3. 51 gal/min. Casing 6 in.: 0 to 48 ft.
57	330713085341001	Wadley	Ballard and Son 1955	100	6	AMS	642	25.5	3-31-70	N	P	Well no. 2. 35 gal/min. Casing 6 in.: 0 to 60 ft.
58	330339085560301	Hackneyville High School	Carlisle and Ballard 1954	100	6	PG	702	30	1954	J	N	Casing 6 in.: 0 to 95 ft.
59	330338085560301	Hackneyville High School	Carlisle and Ballard 1954	155	6	PG	698	25.4	12-04-69	J	N	Casing 6 in.: 0 to 120 ft.
60	330110086184801	Weogufka High School	Graves 1947	120	6	TS	668	26	11-12-47	S	N	
61	330110086185001	Weogufka High School	Coleman Supply 1966	219	6	TS	668	--	--	S	N	
62	330005086120801	Coosa County Vocational Center	Graves	215	6	AMS	770	--	--	S	P	Well no. 1.
63	330200085472001	Newsite	Ballard and Son 1967	206	6	WF	727	7.2	3-12-68	S	N	24 gal/min.
64	330200085472002	Newsite	Ballard and Son 1967	100	6	WF	723	8.3	1-30-87	S	N	20 gal/min. Casing 6 in.: 0 to 30 ft.
65	330312085291701	Chambers County High School	Virginia Well and Supply 1951	--	9 6	DB	667	21.1	6-27-69	S	P	

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
66	325842085442401	U.S. Dept. of the Interior	Adams-Massey 1962	110	6	AMS	540	17.93	1-30-87	-	P	Horseshoe Bend National Park.
67	330042085205701	Five Points Elem. School	Carlisle and Ballard 1955	241	9 6	DB	878	38.14	2-03-87	S	P	
68	330101085203501	Five Points High School	Adams-Massey 1951	350	9 6	DB	860	75.70	2-03-87	S	P	
69	325450086124501	Avondale Mills	Graves 1965	371	6	AMS	779	7.20	1-26-87	S	N	Well no. 1. Casing 6 in.: 0 to 76 ft.
70	325449086123201	Avondale Mills	Graves 1965	250	6	AMS	805	62.3	7-03-68	N	N	Well no. 2. Casing 6 in.: 0 to 61 ft.
71	325449086121801	Avondale Mills	Graves 1965	340	6	AMS	776	32	7-03-68	N	N	Well no. 3. Casing 6 in.: 0 to 68 ft.
72	325449086121501	Avondale Mills	Graves 1966	160	8	AMS	753	23.5	7-03-68	N	N	Well no. 4. Casing 8 in.: 0 to 46 ft.
73	325448086121201	Avondale Mills	Graves 1966	310	6	AMS	746	34.9	7-03-68	S	N	Well no. 5. Casing 6 in.: 0 to 29 ft.
74	325450086121001	Avondale Mills	Graves 1972	340	8	AMS	780	--	--	S	P	Well no. 6.
75	325448086120801	Avondale Mills	Graves 1972	--	6	AMS	760	--	--	S	N	Well no. 7.
76	325446086120501	Avondale Mills	Graves 1972	--	6	AMS	740	--	--	S	P	Well no. 8.
77	325355086122001	Town of Rockford	Graves	--	6	PG	780	9.3	1-26-87	S	N	Well no. 3.
78	325323086131801	Town of Rockford	Coleman Supply 1960	300	6	PG	728	24.5	4-25-85	T	P	Well no. 1. 33 gal/min. Casing 6 in.: 0 to 39 ft.
79	325320086132001	Town of Rockford	C.D. Pace 1941	237	8	PG	718	35.6	7-27-66	T	P	Well no. 2. 15 gal/min. Casing 8 in.: 0 to 30 ft.
80	325535085510401	AASCA Camp	Ballard 1976	200	6	AMS	500	9.50	1-30-87	S	P	Casing 6 in.: 0 to 75 ft.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
81	330109085134001	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	700	44.8	7-19-73	S	P	
82	330100085130101	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	680	16.0	6-18-73	S	P	
83	330006085135501	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	660	43.1	7-19-73	S	P	
84	325951085140601	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	--	DB	645	--	--	P	P	Veasey Creek.
85	325947085134801	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	--	DB	650	--	--	P	P	Veasey Creek.
86	325946085135501	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	670	--	--	S	P	Veasey Creek.
87	325930085123301	Mrs. Harold Knight	--	120	10 6	DB	665	30.26	2-04-87	S	P	Rocky Point Camp Ground.
88	325855085123501	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	650	15.2	7-13-73	S	P	Amity Park.
89	325833085131401	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	645	6.6	6-28-73	S	P	Amity Park.
90	325836085125001	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	680	43.5	7-11-73	S	P	Amity Park.
91	325849085123401	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	-	DB	665	33.9	6-27-83	-	P	Amity Park.
92	325825085123001	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	665	73.8	6-26-73	S	P	Amity Park.
93	325724085130501	U.S. Corps of Engineers	--	--	-	DB	680	--	--	S	P	Burnt Village Camp Ground well.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
94	325716085123501	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	8	DB	650	14.7	8-27-73	S	P	Rocky Point.
95	325702085125001	U.S. Corps of Engineers	--	--	--	DB	630	12.78	2-03-87	S	P	Burnt Village Marina well.
96	325611085121201	U.S. Corps of Engineers	Dixie Well Drilling 1972-73	--	--	DB	655	25.5	7-13-73	-	P	West Over-look well.
97	325135085571901	Lake o' the Hill Trailer Park	--	--	--	AMS	600	--	--	-	N	
98	325206085544801	Piney Woods Marina Restau-rant	--	--	--	AMS	500	--	--	-	P	
99	325206085544802	Piney Woods Marina Restau-rant	--	--	--	AMS	500	--	--	-	P	
100	325128085554401	Wind Creek State Park	Ballard and Son 1960	150	6	AMS	506	41	1968	S	N	L-5. Casing 6 in.: 0 to 120 ft.
101	325126085554201	Wind Creek State Park	Ballard and Son 1960	130	6	AMS	506	11.79	2-02-87	S	N	L-6. Casing 6 in.: 0 to 76 ft.
102	325400085241501	Town of Lafayette	-- 1911	275	7	DB	815	20.85	2-03-87	-	N	
103	324730085533501	Pleasure Point Park	Graves 1966	200	6	PG	521	30	1966	S	P	N-2. Casing 6 in.: 0 to 36 ft.
104	324730085533502	Pleasure Point Park	Ballard and Son 1967	75	6	PG	490	12	1967	-	P	N-3.
105	325011085452701	Town of Dadeville	H.W. Peerson 1943	350	6	DB	724	33.04	11-01-82	N	N	94 gal/min. Casing 6 in.: 0 to 78 ft.
106	324922085444301	Town of Dadeville	H.W. Peerson 1949	225	8	DB	553	15	1949	T	N	65 gal/min. Casing 8 in.: 0 to 40 ft.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
107	325027085312901	Plainview Headstart School	Carlisle and Ballard 1955	77	6	DB	749	19.77	2-03-87	S	P	
108	324553085524001	Camp Alamisco	Champion Well Drilling 1984	539	6	PG	570	79.50	2-02-87	S	P	Alabama Geological Survey semi-annual well. Casing 6 in.: 0 to 80 ft.
109	324633085493201	Maxwell Air Force Base	Ballard and Son 1968	98	6	DB	500	31.37	2-02-87	-	-	Base recreational area. 40 gal/min. Casing 6 in.: 0 to 82 ft.
110	324744085391201	Camp Hill	Virginia Well and Supply 1957	202	6	DB	628	20	1957	N	N	42 gal/min. Casing 6 in.: 0 to 73 ft.
111	324805085382401	Camp Hill	Virginia Well and Supply 1952	500	8	DB	632	+1	2-05-70	S	N	6 gal/min. Casing 8 in.: 0 to 50 ft.
112	324733085184001	Cusseta Headstart School	Ballard and Son 1957	123	6	DB	664	56.26	2-03-87	S	P	
113	324252085510802	Bama Park	Ballard and Son 1960	35	6	DB	503	12.4	11-07-69	J	P	
114	324252085510801	Bama Park	Graves 1968	203	6	DB	525	--	--	S	P	
115	324156085405701	Sheriffs Assoc. of Ala.	Graves 1973	123	6	DB	740	--	--	S	P	Girls Ranch.
116	323500085274801	Town of Auburn	--	140	-	WB	610	165	1965	T	N	Not used for drinking.
117	323510085192001	Town of Opelika	--	--	--	WB	590	--	--	F	P	Spring, back up source.
118	323342085222501	Beauregard Water Works	--	165	12 8	WB	--	16	1981	T	N	Well no. 3. Casing 12 in.: 0 to 82 ft; 8 in.: 0 to 124 ft.
119	323341085222401	Beauregard Water Works	--	173	8	WB	--	16.75	1975	S	P	Well no. 1. Casing 8 in.: 0 to 30 ft.
120	323259085250801	Beauregard Water Works	--	148	12	WB	--	25.25	1980	T	P	Well no. 2. Casing 12 in.: 0 to 108 ft.

Table 2.--Records of public water-supply wells in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
121	322940085040701	Smiths Water Authority	Ballard and Son 1973	252	8	WB	345	--	--	S	P	Ennis well.
122	322946085031901	Smiths Water Authority	Robinson	350	6	WB	360	--	--	S	P	Ross well. Smiths Water Authority is a Lee County Water Authority, but this well is in Russell County.
123	322942085031601	Smiths Water Authority	Robinson	350	6	WB	361	265.4	2-04-86	N	N	Observation well near Ross well.
124	322617085243501	Auburn Exp. Station	Bozeman and Son 1966	157	6 4	WB	480	57.83	5-00-85			