SUMMARY OF GROUND WATER RESOURCES IN ITAWAMBA, PRENTISS, AND TISHOMINGO COUNTIES, MISSISSIPPI

By

James H.Hoffmann, RPG

Open-File Report 340

Mississippi Department of Environmental Quality
Office of Geology
In Cooperation with the Office of Land and Water Resources

Prepared at the direction of the Three-County Water Management Plan Committee of the Tombigbee River Valley Water Management District By:

SUMMARY OF GROUNDWATER RESOURCES IN ITAWAMBA, PRENTISS, AND TISHOMINGO COUNTIES, MISSISSIPPI

Prepared at the direction of the Three-County Water Management Plan Committee of the Tombigbee River Valley Water Management District by:

James H. Hoffmann, RPG
July 10, 2009

Summary of Ground Water Resources in
Itawamba, Prentiss, and Tishomingo Counties, Mississippi

TABLE OF CONTENTS

APPENDICES………………………………………………………….. 36

Summary of Ground Water Resources in Itawamba, Prentiss, and Tishomingo Counties, Mississippi

Introduction

General Geology and Hydrogeology

These counties are located in northeastern Mississippi (fig. 1) along the eastern flank of the Mississippi embayment of the East Gulf Coastal Plain. The Mississippi embayment is a structural trough that slopes southward and approximately parallels the present course of the Mississippi River. This trough has gradually subsided for many millions of years and has been filled in as it subsided with various kinds of sediments, including clay, chalk, shale, limestone, silt, sand, and gravel.

The oldest sediments that are exposed at the surface in the three counties comprising the area of interest are rocks of Paleozoic age which were deposited prior to development of the Mississippi embayment (fig. 2). Jennings (1994) stated that the Paleozoic units generally dip to the south-southwest at 25 to 50 feet per mile. The next oldest sediments exposed at the surface in these three counties belong to the Upper Cretaceous Series and are mainly composed of sand, gravel, clay, marl, and chalk overlying the Paleozoic units and cropping out in a belt adjoining the Paleozoic outcrop on the southwest and west (fig. 3).

Depositional conditions and regional subsidence have resulted in gently sloping strata of Cretaceous age that characteristically thicken in the downdip direction into the subsurface and thin generally to the east or northeast across their outcrop areas (figs. 4-6). Boswell (1963) published a series of structure maps illustrating that in the northern part of northeastern Mississippi, the strata slope westward toward the axis of the Mississippi embayment and in the counties farther south, the strata dip more toward the southwest in the direction of the Gulf Coast geosyncline. The average rate of dip for the region is approximately 30 feet per mile, but the overall range is from less than 20 feet per mile near the Tennessee line to approximately 45 feet per mile in Kemper County (Boswell, 1963).

The overall effect of these structural features results in belts of sediments at land surface that typically enter the state from Alabama, trend in a northwesterly direction, and then curve northward before entering Tennessee. These units crop out in concentric belts, the older formations being exposed to the northeast and progressively younger units to the west and south (Bicker, 1969).

Primary units of Paleozoic age in these three counties as described by Jennings (1994) are as follows, in ascending order from the oldest to the youngest: the Devonian and Lower Mississippian rocks, which generally consist of limestones, cherts, and calcareous shales;

Upper Mississippian rocks, which are mainly sandstones and shales with some limestone intervals; and Pennsylvanian rocks, which are mainly comprised of sandstones, shales, conglomerates, and coal beds. The major units of Cretaceous age in these counties are, in ascending order, the Gordo Formation of the Tuscaloosa Group, McShan Formation, Eutaw Formation, Mooreville Chalk, Coffee Sand, Demopolis Chalk, and the Ripley Formation (the last four of the Selma Group).

Devonian Rocks crop out in Tishomingo County, mainly near Pickwick Lake where the Ross Formation and the overlying Chattanooga Shale are found at the surface in a few places. The Devonian rocks dip into the subsurface beneath rocks of Mississippian age and also subcrop beneath the Gordo and Eutaw Formations. Jennings (1994) stated that, below the Chattanooga Shale, the Devonian section in northeastern Mississippi consists of a thick interval of chert, cherty limestone, and some shale. He stated that the Chattanooga Shale is reportedly up to 35 feet thick in Tishomingo County and the chert and cherty limestone interval ranges from 150 feet in northern Tishomingo County to more than 800 feet in Lafayette County, near the limit of his study area.

The Mississippian **Iowa Group,** as described by Jennings (1994), is composed of the following units from the base up: the Maury Shale, the Fort Payne Formation, and the Tuscumbia Formation. Weathered and fractured chert of the Fort Payne and Tuscumbia crops out at the surface in northern Tishomingo County and the Fort Payne subcrops beneath Cretaceous sediments in the vicinity of Iuka. The Maury Shale is typically a few feet of green-gray claystone above the Devonian Chattanooga Formation and below the Fort Payne Formation. The lower part of the Fort Payne is a shaly limestone interval, and the upper Fort Payne is typically composed of chert and cherty limestone. The Tuscumbia is primarily limestone with varying chert content. Jennings found that the Iowa Group thickens from less than 50 feet in Lafayette County to more than 400 feet in Tishomingo County.

The Upper Mississippian **Chester Series** overlies the Iowa Group and is overlain by Pennsylvanian rocks and subcrops beneath Cretaceous sediments. The Chester is a thick sequence of sedimentary rocks that consists primarily of sandstones, shales, and limestones. Jennings (1994) described the Chester in northeast Mississippi as having the lower part dominated by shales with intervals of sandstones and limestones. This lower unit, known as the Pride Mountain Formation, is exposed at the surface in southern Tishomingo County. Overlying the Pride Mountain is the Hartselle Sandstone, which crops out in southern Tishomingo County and is found in the subsurface in southeastern Tishomingo and northeastern Itawamba Counties according to Jennings. The Hartselle is tightly cemented sandstone with some thin beds of shale. In some of the area of northeastern Mississippi, the Hartselle is overlain by the Bangor Limestone, which is not known to occur at the surface in Mississippi but subcrops beneath the Gordo Formation across northern and central Itawamba County. Jennings stated that, west of the Bangor Limestone subcrop, in Lee, Pontotoc, and Lafayette Counties, the lower and middle parts of the unit that is often termed the Muldon clastic interval in the subsurface, is a sandstone and shale sequence that is a partial stratigraphic equivalent of the Bangor.

Above the Muldon clastics are the thin Millerella Limestone and a zone which consists mainly of shales and sandstone with minor limestone in northeastern Mississippi.

Pennsylvanian rocks are not exposed at the surface in Mississippi. The Pennsylvanian is a thick section of sandstones, conglomerates, shales, and coal beds (Jennings, 1994). These rocks subcrop beneath Cretaceous sediments in southern Itawamba, Lee, and Pontotoc Counties and areas to the south.

The **Gordo Formation** is the only unit of the Tuscaloosa Group that crops out in Mississippi. It is exposed in parts of Tishomingo County, in the beds of small creeks flowing into Mackeys Creek in southeastern Prentiss County (Parks, 1960, p. 24), and the eastern parts of Itawamba and Monroe Counties before curving southeastward into Alabama. From the outcrop area, the Gordo dips into the subsurface with the direction of dip of the formation gradually changing from a westward direction in northeast Mississippi to southwestward further south. The Gordo Formation is less than 30 feet thick in part of Prentiss County and thickens to more than 300 feet in Noxubee County and about 400 feet in Oktibbeha and Kemper Counties (Boswell, 1963, p. 45-47). In general, the Gordo Formation thins to the north and northwest so that it is seldom present in the subsurface north of an irregular line from southeastern Alcorn County to northwestern Prentiss County through central Union County into central Lafayette County with the exception of isolated deposits representing ancient Gordo stream channels that were incised into the Paleozoic surface (Boswell, 1978). In those areas in which Gordo sediments were deposited on the Paleozoic surface, the formation may thicken locally where the younger Gordo material filled in topographic low areas on the Paleozoic surface. Conversely, the Gordo may thin drastically where it was deposited over topographic high areas on the ancient surface that was developed on the Paleozoic rocks.

The Gordo is typically composed of two units: an upper unit consisting primarily of clay with interbedded sand, and a lower unit mainly composed of coarse sand and gravel. This basal sand and gravel unit generally represents the Gordo aquifer, although there are some locations at which significant sand and gravel occurs in the upper part of the formation. The Gordo Formation overlies Paleozoic rocks and underlies the McShan Formation in the three counties of interest.

The **McShan Formation** overlies the Gordo Formation and underlies the Eutaw Formation. This unit crops out in Tishomingo, southeastern Prentiss, eastern Itawamba and Monroe Counties, and then extends southeastward into western Alabama. Boswell (1963) described the McShan in Mississippi and stated that it could not be satisfactorily differentiated from the Eutaw Formation in the subsurface. He found that the McShan Formation is more than 200 feet thick in the subsurface in Noxubee and Kemper Counties and thins northward to a few feet at its northern limit of occurrence, which is probably along a zone through Tishomingo, Alcorn, Prentiss, and Union Counties. Boswell noted that it is about 100 feet thick in the area of its outcrop in Monroe County and is approximately 50 feet in Itawamba County and much less in Tishomingo, Prentiss, and Union Counties. The McShan typically consists of interbedded clay and fine sand.

Lenticular beds of fine to medium sand are usually present, particularly in the lower part of the formation. Boswell stated that the characteristics of the aquifers in the McShan Formation are quite variable. In some areas the McShan is a source of water to large-capacity wells, while in other areas there is not enough sand present to permit the construction of small-capacity wells.

The **Eutaw Formation** crops out in Tishomingo, Alcorn, Prentiss, Lee, Itawamba, Monroe, Clay, and Lowndes Counties in Mississippi and extends southeastward into Alabama from Lowndes County. It also extends to the north into central Tennessee. In much of the area of its occurrence in the subsurface of Mississippi it is about 200 feet thick. It thins or is absent in northwestern Mississippi. The Eutaw is principally composed of thin-bedded clay and fine to medium sand. Boswell (1963) noted that the proportion of sand in the Eutaw Formation decreases southward and the beds of sand become more irregular. The Eutaw Formation has historically been the most widely used aquifer in northeastern Mississippi. In the three counties of interest the Eutaw overlies the McShan Formation and Paleozoic rocks and underlies the Mooreville Chalk and Coffee Sand of the Selma Group. Water-bearing sands in the Eutaw and McShan Formations are considered to constitute the Eutaw-McShan aquifer.

The **Selma Group** has an average thickness of 850 feet (Boswell, 1963) and consists of the following units in the three-county area in ascending order: the Mooreville Chalk, Coffee Sand, Demopolis Chalk, and the Ripley Formation.

The **Mooreville Chalk** enters Noxubee County from western Alabama and crops out in northeastern Noxubee, eastern and central Lowndes County, eastern Clay County, western Monroe, eastern Lee, and extreme western Itawamba Counties. The Mooreville Chalk thins northward from about 280 feet in the subsurface of Kemper County to approximately 250 feet in Noxubee County and to about 130 feet thick in central Clay County (Boswell, 1963). As discussed above, the Mooreville grades northward into the Coffee Sand. This unit is composed of impure chalk or calcareous clay and has no importance as a source of water.

The **Coffee Sand** crops out in a north-south trending belt from Tennessee into eastern Alcorn and western Tishomingo counties, central Prentiss, the northeastern quarter of Lee to just south of Tupelo, and the extreme northwestern corner of Itawamba County. From the outcrop area, the Coffee Sand dips westward into the subsurface beneath the Demopolis Chalk.

The southern boundary of the Coffee Sand as described by Boswell (1963) is an arbitrary zone from central Lee County at approximately the latitude of Tupelo westward into the subsurface of Lee, central Pontotoc, and southern Lafayette Counties. In this area, the Coffee Sand changes laterally to the south into the more marine lithology of its equivalent units, the Mooreville Chalk and the lower part of the Demopolis Chalk. Boswell (1963) considered the southern limit of the Coffee Sand aquifer to be the zone where there is not sufficient sand to allow the construction of small-capacity water wells in the unit.

From the vicinity of Tupelo northward to about the northern boundary of Lee County and westward into the subsurface, the Coffee Sand is underlain by the chalk and clay of the Mooreville Chalk. North of this area, the Coffee Sand is in direct connection with the Eutaw Formation. In the areas to the north and west of the limits of occurrence of the Eutaw Formation in Marshall, DeSoto, and Benton Counties, the Coffee Sand rests directly upon rocks of Paleozoic age.

The Coffee Sand is composed of fine to medium-grained sand with zones of silty sand and clay and occasional beds of sandstone. Sand beds range from several inches to several feet in thickness and may be up to 30 feet thick in some places (Boswell, 1979). The overall thickness of the formation varies in the subsurface. It is about 200 feet thick in northern Alcorn County, 250 feet in Tippah and northern Union Counties, and 150 feet in Pontotoc County, and reaches a maximum thickness of 300 feet in northern Lee County (Boswell, 1963, p. 56).

The **Demopolis Chalk** crops out in a belt extending from northeastern Kemper County, where it enters Mississippi from Alabama, through central Noxubee and western Lowndes Counties northward to the Tennessee border in Alcorn County. This unit has a maximum subsurface thickness of 500 feet in Kemper County northward to central Pontotoc County (Boswell, 1963). To the north in the subsurface of Tippah County, the Demopolis is about 250 feet thick. The Demopolis Chalk is mainly composed of relatively pure, compact chalk and is of no importance as a source of water.

The **Ripley Formation** crops out in an arcuate belt that extends from Tennessee into Alcorn and Tippah Counties and southward to Clay County, where it swings to the southeast into the northeastern part of Kemper County and on into Alabama. From the outcrop area, the formation dips into the subsurface to the west in northeastern Mississippi and to the southwest in the area of the state to the south. The Ripley is composed of sediments ranging from chalky sand and clay in the south to thick beds of sand, clay, sandstone, marl, and limestone in the north. The Ripley Formation is about 40 feet thick in Kemper County and increases to more than 400 feet in Tippah County (Boswell, 1963, p. 58).

The aquifers in the Ripley Formation are hydraulically isolated from underlying aquifers of Cretaceous age by the Demopolis Chalk and from the overlying aquifers of the Wilcox Group by the Porters Creek Clay of the Midway Group. The following statements are derived from a discussion of the Ripley by Boswell (1963). South of the latitude of Pontotoc and Union Counties, the Prairie Bluff Chalk overlies the Ripley, and to the north it is overlain by the Owl Creek Formation. In northern Mississippi, near the Tennessee boundary, the Ripley Formation comprises, in ascending order, the transitional clay, Coon Creek Tongue, McNairy Sand Member, and the Chiwapa Sandstone Member. The Principal aquifers of the Ripley Formation are in sands of the Chiwapa Member, the McNairy Sand Member, and a lower sand aquifer originally described by Parks (1961, p. 78) in Calhoun County (Boswell, 1979).

The McNairy Sand Member is the most productive Ripley aquifer, typically being composed of medium to coarse-grained sand and reaching a maximum thickness in Mississippi of about 200 feet in Tippah County (Boswell, 1963). The McNairy thins rapidly southward and wedges out in central Union County. The McNairy is widely utilized in Tippah County as a source of water and is probably usable in the subsurface of most of Benton County and part of Marshall County (Boswell, 1963, p. 61).

The Chiwapa Sandstone Member is only a few feet thick in northern Tippah County and thickens southward until it attains a thickness of about 100 feet in the subsurface in Pontotoc County (Boswell, 1979). To the south, the Chiwapa grades into calcareous sand, clay, and silt in Chickasaw County. Boswell (1963, p. 61) stated that the Chiwapa replaces the McNairy as the principal Ripley aquifer south of northern Union County and that it is extensively used as a source of water in Pontotoc, part of northwestern Chickasaw, northeastern Lafayette, and part of western Union Counties. Permeability is lower than that of the McNairy Sand and decreases westward into the subsurface so that the Chiwapa is not a significant aquifer in Calhoun County.

The sand aquifer in the lower part of the Ripley is used in northeastern Calhoun County as well as parts of Chickasaw, Pontotoc, and Lafayette Counties. South of central Calhoun County and down the dip to the west, this aquifer is too fine-grained and calcareous to yield significant supplies of water to wells (Boswell, 1979).

General Ground Water Information

Ground water has been defined as water which causes a saturated condition in material below the surface of the earth. An aquifer has been defined as any body of saturated material which is of sufficient permeability, thickness, and areal extent to yield ground water to wells in useful quantities.

Water-table conditions exist where geologic materials are sufficiently permeable to allow water to percolate downward directly from the surface of the ground and where water is available from precipitation or other sources. Ground water under water-table conditions is generally derived from precipitation in the immediate area and may be discharged naturally by seepage into streams, springs, or by the process of evapotranspiration. Many shallow wells obtain water from water-table or unconfined aquifers.

Artesian aquifers are formed where saturated permeable materials are overlain and underlain by less permeable material. These conditions confine the water in the aquifer. The usual source of water in an artesian aquifer, as in the water-table aquifer, is precipitation on the intake area, which is the area of outcrop of the geologic unit that includes the aquifer. Water in an artesian aquifer will rise above the top of the aquifer when penetrated by a well, because the water is under hydrostatic (artesian) pressure. Hydrostatic pressure is created when the aquifer at its intake (recharge) area is at a higher altitude than the aquifer is at the well location. Thus, gravity is the primary force that produces hydrostatic pressure and causes ground water movement under natural conditions. The water level in a well is dependent upon the hydrostatic pressure in the aquifer at that location.

In a very concise discussion of ground-water movement and water levels, Boswell (1963) presented many of the following points. All ground water is in motion, though the rate of movement is quite variable, depending on hydrologic conditions. Water levels fluctuate constantly in water-table and artesian aquifers due to both natural and artificial causes. Near the intake areas, water levels in most aquifers show a seasonal change that is directly related to precipitation. The highest levels generally occur each year in the late spring, following the winter and spring rains. There is a gradual decline in water levels through the summer and early fall, with the lowest levels typically occurring in October. As the aquifer dips into the subsurface and ground water conditions change from water-table to artesian, this seasonal cycle is modified gradually down the dip and becomes almost imperceptible in deeper wells.

Superimposed on changes in water levels caused by natural factors is a change caused by significant withdrawal of water from wells. This can cause a long-term regional decline in water levels and a more pronounced local decline in water levels in areas in which pumping wells are concentrated. Ground water moves in accordance with physical laws. When water is removed from an aquifer by pumping a well, water moves radially toward the well to replace it.

Declining water levels in any area are not necessarily an indication of diminishing supply, but may only represent an adjustment of the hydraulic gradient in the aquifer in response to increased pumping in the area. In order to properly evaluate the significance of water-level changes, it is necessary to monitor water levels over a period of time.

It should be noted that in artesian aquifers dewatering does not begin until water levels fall below the top of the aquifer at a particular location. Until that condition occurs, the aquifer is fully saturated with water. The vertical distance between the elevation of the static (non-pumping) water level in a well and the elevation of the top of the aquifer at that location is often referred to as available drawdown space.

The ability of aquifers to transmit water varies considerably. Transmission of water by an aquifer depends on the size of open spaces between grains of aquifer material, such as sand or gravel, or the extent of fractures in rock, and the degree of permeability or interconnection of the open spaces. Transmissivity is a measure of the ability of an aquifer to transmit water. Transmissivity is expressed in units of cubic feet of water per day per foot of aquifer width that can be transmitted under a unit hydraulic gradient. These units are often written as feet squared per day. The U. S. Geological Survey (USGS) rates aquifers as "*poor*" if transmissivity is less than 1,000 feet squared per day, "*fair*" if transmissivity is 1,000 to 5,000 feet squared per day, "*good*" if transmissivity is 5,000 to 10,000 feet squared per day, and "*excellent*" if transmissivity is more than 10,000 feet squared per day (figs. 7-9).

Water Quality

Ground water normally contains in solution various quantities of naturally-occurring minerals with which it has come in contact. In Mississippi, ground water is generally of good quality for many purposes.

Rain water is relatively pure, although it may contain dust particles and gases dissolved from the atmosphere, such as carbon dioxide (Boswell, 1963). As a result, water in shallow aquifers is normally low in dissolved-solids, often less than 100 parts per million (ppm). The water tends to be soft to moderately hard, and the hydrogen-ion concentration (pH) is usually less than 7.0 (Wasson and Tharpe, 1975). As water moves deeper into the subsurface, it undergoes changes in quality. Dissolved-solids content typically increases and pH of the water also rises which is normally accompanied by a reduction in concentrations of iron in solution.

At some locations various ground-water quality issues may be of concern. Some of the more common water quality issues in Mississippi are: excessive concentrations of iron, manganese, chlorides, or total dissolved solids; low pH; excessive color; and hardness. The U. S. Environmetal Protection Agency (EPA) has established National Secondary Drinking Water Regulations that set non-mandatory standards for 15 constituents, including most of the aforementioned, which act as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color, and odor. This is because this set of constituents is not generally considered to present a risk to human health. These water quality issues can be resolved with treatment, which is becoming progressively more efficient. The following discussions of mineral constituents and chemical properties of ground water are adapted from Shows (1970). These are not meant to be inclusive but summarize briefly those issues that are generally of concern to water users in Mississippi.

Iron in solution is present in nearly all ground water. The U.S. EPA's secondary drinking water standards set a limit of 0.3 ppm for iron and 0.05 ppm for **manganese** in water. Iron precipitates on exposure of water to the air, causing reddish-brown stains on plumbing fixtures and clothes washed in water with high concentrations of iron. Manganese produces black stains on plumbing fixtures and clothes. In large concentrations, iron imparts a taste to water and also may make it unsuitable for manufacture of products associated with food processing. Treatment to remove iron and manganese from water may include aeration, precipitation, filtration, or ion exchange.

Chloride is usually present in varying concentrations in natural water. Small quantities of chloride have little effect on the use of water, but excessive concentrations may impart a salty taste to water. Some authors state that water containing less than 150 ppm chlorides may be satisfactory for most purposes. Chloride concentrations of more than

250 ppm are generally considered objectionable for public water supplies. Reverse osmosis is currently being used to remove high concentrations of chlorides in water.

Ground water containing less than 1,000 ppm **total dissolved solids** (TDS) is considered fresh water for the purposes of this discussion. The EPA secondary drinking water standards set a limit of 500 ppm TDS for drinking water supplies. Total dissolved solids reported in chemical analyses are approximations of the total mineral content in the waters analyzed. Most industrial processes require water containing less than 1,000 ppm TDS. Reverse osmosis is utilized to remove excessive concentrations of dissolved solids from water.

Hydrogen-ion concentration (**pH**) may affect the usefulness of water for many industrial purposes. A pH of 7.0 indicates a neutral solution. Values of pH progressively greater than 7.0 indicate increasing alkalinity, and values progressively lower than 7.0 denote increasing acidity. The secondary drinking water standards of the EPA recommend a pH range of 6.5 to 8.5.

Color refers to the appearance of water that is free of suspended matter. It is the result of extraction of coloring matter from naturally-occurring organic materials that are deposited with the sediments that contain aquifers. As recommended by the EPA, natural color of 15 platinum-cobalt units or less normally is not noticeable and even greater amounts are harmless in drinking water. For aesthetic reasons, excessive color in drinking water is undesirable and for many industrial purposes, color is objectionable. Excessive color may be removed by coagulation, settling, and filtration. More recently, reverse osmosis and ozonation have been used to remove color from water.

Hardness in water is a property caused principally by calcium and magnesium in solution and is generally reported as the calcium carbonate equivalent. Water having a hardness of 60 ppm or less is soft; 61 to 120 ppm is moderately hard; and more than 120 ppm is hard. Hardness in water is usually recognized by the increased quantity of soap required to make a permanent lather and is indirectly an indicator of the scale-forming tendency of the water when used in boilers.

Most natural water contains at least some **fluoride**. U.S. Public Health Service drinking water standards recommend a limit ranging from 0.7 to 1.0 ppm in areas having an average annual maximum daily temperature of 70.7 to 79.2 degrees Fahrenheit (F). The EPA secondary drinking water standards set a limit of 2.0 ppm. In large concentrations, fluoride reportedly can cause mottling of children’s teeth.

Ground water at a given depth in a particular location is generally of constant **temperature**. The average temperature of ground water at shallow depths within a few feet of land surface is usually about the same as the mean annual air temperature at any particular location. It normally increases with depth at a rate of approximately 1 degree F for each 65 to 100 feet in Mississippi.

Limitations

Due to the generalized nature and scope of this document, information presented herein should not be considered a substitute for the collection of site-specific data to ascertain the availability of water for specific purposes since the character and occurrence of sands and porous and permeable zones in rocks as well as water quality can be highly variable in the subsurface from one location to another. In addition, some statements in this document are generalized or based upon interpretations of borehole geophysical logs. Aquifer characteristics are site-specific, so published aquifer test data and other information may not be applicable to another site. Estimates of transmissivity are highly generalized and should be utilized for planning purposes only regarding potential sites to collect detailed information.

Additionally, the accuracy and completeness of some source data utilized in the preparation of this document cannot be warranted. These include but are not limited to such information as depths of screened intervals of water wells, well locations, water levels, and results of analyses of water samples which are presented as reported from their original sources. In some cases, there may be insufficient information available to definitively determine the aquifer in which a well is screened.

For these reasons, this document should be regarded as a guide to be used for planning purposes only. It is not a guarantee of the availability of ground water at any location. In order to determine the quantity and quality of a ground water source that can be developed at any particular location, a drilling and testing program is necessary.

Terrace deposits and alluvium in the flood plains of streams have supplied water to shallow, small capacity wells through the years but are not considered significant sources of water supply. For this reason, these aquifers will not be discussed herein.

Ground Water Resources of Itawamba County

Up to four geologic units may contain fresh water as it is defined for the purposes of this report. From the oldest to the youngest deposits, these are Paleozoic rocks, the Gordo Formation, the Eutaw and McShan Formations, and the Coffee Sand Formation. Only the Eutaw-McShan and Gordo have been proven to be sources of significant supplies of water.

Paleozoic Rocks

Only one water well is known to have produced water from Paleozoic rocks in Itawamba County, therefore the quantity and quality of water available from these rocks is largely unknown.

Jennings (1994) constructed a map depicting the general area that various Paleozoic units subcrop beneath freshwater-bearing Cretaceous deposits. In the northwestern corner of Itawamba County the map shows the Pride Mountain Formation subcropping. In an area of about 3 to 4 square miles at the northern county line just south of the intersection of Prentiss, Tishomingo, and Itawamba Counties, the Hartselle Sandstone subcrops. The Bangor Limestone subcrops from the northeastern corner of the county across most of the northern half of the county. Rocks that are comprised of a sequence of shale and sandstone with minor limestone are shown to subcrop across part of central and southern Itawamba County on the south side of the Bangor subcrop. In southern Itawamba County, Pennsylvanian rocks subcrop.

Jennings (1994) stated that the Pride Mountain Formation probably “has poor aquifer potential due to the predominance of shales and sparsity of porous sandstone or limestone intervals”.

There is noteworthy information regarding apparent Pride Mountain rocks in northwestern Itawamba County (Jennings, 1996). In May of 1996, the MDEQ Office of Geology drilled a stratigraphic test hole in Section 22, Township 7 South, Range 8 East to a total depth of 428 feet. This test hole penetrated 176 feet of the Eutaw Formation, 26 feet of the McShan Formation, and 216 feet of the Gordo Formation. At this site, within the Gordo there was an interval of coarse-grained sand and fine gravel at a depth of 232 to 270 feet and an interval of medium to coarse-grained gravel with minor sandstone and clay intervals at a depth of 287 to 388 feet. These represent potential aquifer intervals. The top of Paleozoic rocks was apparently reached at a depth of 418 feet, based mainly upon interpretation of the rate of penetration by the drill bit. Below a depth of 418 feet, circulation of drilling fluid was lost because the formation being drilled apparently was so permeable that fluid was drained from the borehole and part of a large dug pit. This occurred each time an attempt was made to drill ahead despite multiple attempts to stop the loss of fluid. All cuttings from this apparent Paleozoic interval were lost down the hole with the drilling fluid so nothing is known concerning the character of this rock.

The apparent permeability of the Paleozoic rocks at this site may be due to fractures or possibly solution features and the permeable section might be charged with fresh water if there is sufficient hydraulic connection with the Gordo aquifer. Based on the theory held by many drillers that an interval that "takes a lot of fluid will also give up a lot of fluid", this site might be worth testing someday to assess its potential to supply water.

Jennings (1994) stated that, "Outcrops of the Hartselle Sandstone in Tishomingo County consist of tightly cemented sandstone and thin shale beds, and the formation appears to have limited potential as an aquifer in Mississippi". He added that in adjacent counties of northwestern Alabama the Hartselle supplies water to a few low-yield (less than 5 gpm) wells. A well owned by the Town of Belmont in southern Tishomingo County reportedly has a pump capacity of 400 gpm and is thought to be screened in Paleozoic rocks. No cuttings or geophysical logs from this well have been available to verify this and determine the geologic unit in which the well is screened. It may be screened in fractured Hartselle Sandstone or possibly in the Bangor Limestone, or it may be in large gravel deposited in a Gordo channel.

Jennings (1994) stated that, "The Bangor Limestone is not known to be a source of ground water in Mississippi, but the formation does supply fresh water to low-yield (less than 100 gpm) wells in Colbert and Franklin Counties, Alabama". He summarized the Bangor's aquifer potential in the following paragraph: "Although the potential exists for the presence of paleokarst and associated porosity and permeability development within the Bangor Limestone subcrop belt, geophysical logs of oil and gas test holes drilled through the interval have generally shown low porosity and permeability. The greatest potential for the development of significant fresh water-bearing intervals in the Bangor in Mississippi probably occurs where beds of porous grainstones, known to exist as scattered patches in the subsurface, subcrop beneath Tuscaloosa gravels." It is also possible that fractures may be present in the Bangor, at least locally, that could enhance the ability of this unit to store and transmit water.

In 1972, several wells were drilled in Itawamba County by the U. S. Army Corps of Engineers (USACE) as part of a hydrologic assessment for the Tennessee-Tombigbee Waterway. At a site located in the northeast quarter of Section 24, Township 8 South, Range 8 East, a well was reportedly completed in Paleozoic rocks. This location is in the Bangor subcrop area delineated by Jennings. The well was reportedly screened at a depth of 240 to 260 feet below land surface and flowed at a rate of 10 gallons per minute (gpm) with a water level measured at approximately 11.15 feet above land surface. The results of an analysis of a water sample from this well were published (Wasson and Tharpe, 1975). Iron in solution was 4.5 ppm, chlorides were 4.4 ppm, fluoride was 0.1 ppm, dissolved solids were 115 ppm, pH was 7.0, and hardness was 82 ppm of calcium carbonate equivalent.

The interval characterized by Jennings as, "consisting primarily of shales with interbedded and discontinuous sandstones and minor limestones in northeastern Mississippi" was not considered to have significant aquifer potential because of a general lack of porosity and permeability.

The Pennsylvanian rocks were discussed at length by Jennings (1994) in the following paragraph: "The aquifer potential of the Pennsylvanian rocks is largely unknown in Mississippi. A large area of northeastern Mississippi, in the southern part of the study area and south of the study area, contains Pennsylvanian rocks that underlie Upper Cretaceous aquifers or Lower Cretaceous rocks. Geophysical well logs and well cuttings indicate that many Pottsville sandstones are laterally extensive and sufficiently thick to be considered potential aquifers. In the southern parts of Itawamba and Lee Counties and in southeastern Pontotoc County where Pennsylvanian rocks subcrop at relatively shallow depths, Pottsville sandstone and conglomerate intervals may contain fresh or moderately saline water as indicated by electric logs, but sufficient data are not available to accurately assess the quality or quantity potential of the zones. South of the study area at the Town of Gattman in eastern Monroe County, a well drilled in the early part of this century (actually 1899) into a Pennsylvanian sandstone supplied fresh water for many years. Pottsville wells drilled in the outcrop areas in adjacent Franklin and Marion Counties, Alabama, generally yield less than 50 gpm."

Gordo Formation

The Gordo aquifer has been the most widely used source of ground water for public supplies throughout most of Itawamba County. The Gordo Formation crops out in places in the eastern part of the county and the adjacent parts of Alabama (fig. 3). It dips westward into the subsurface beneath the McShan Formation. Boswell (1963) stated that many domestic wells and the public supply wells at Fulton obtained water from the basal sand and gravel of the Gordo. He further stated that this basal sand and gravel unit was generally of sufficient thickness in Itawamba County to be capable of supplying water to wells of moderate capacity (200 to 400 gpm). The thickness of the Gordo Formation is quite variable as a result of its deposition over the irregular topography of the eroded surface of the Paleozoic rocks. In those wells for which borehole geophysical logs were available, total thickness of the Gordo Formation ranged from approximately 98 to 252 feet.

No aquifer test results have been published for the Gordo aquifer in Itawamba County. The USGS (Wasson, 1986) published a regional map showing estimated general transmissivity trends for this aquifer (fig. 7). This map rated the Gordo aquifer in the northeastern corner of Itawamba County as having "poor" transmissivity, which was defined as being less than 1,000 feet squared per day. In the area of the county generally northeast and east of Fulton, the map depicts the Gordo as having "fair" transmissivity (defined as 1,000 to 5,000 feet squared per day). In the area to the northwest of Fulton and most of the county south of Fulton, this publication rates the Gordo as having "good" transmissivity, which is defined as 5,000 to 10,000 feet squared per day. Along the Monroe County line in the southwestern part of Itawamba County, this map shows the Gordo as having "excellent" transmissivity, which is defined as more than 10,000 feet squared per day. It would be advisable to use caution in taking this map literally as it represents a highly generalized estimate of regional trends. As previously mentioned, the

Gordo Formation is of variable thickness from one location to another, which makes a drilling and testing program a necessity when planning the development of a significant water supply.

Evaluation of non-pumping water levels measured in wells screened in the Gordo aquifer in 2008, together with borehole geophysical logs of these wells, illustrates the saturated thickness and available drawdown space relative to the top of the aquifer at the time the measurements were taken. In northeastern Itawamba County, the water level in one well was less than 13 feet above the top of the well screen, leaving very little drawdown space. At two other locations in the eastern part of the county, the water level measured was within 10 to 20 feet above the top of the main Gordo aquifer. To the west, more drawdown space is generally available. At Fulton, water levels measured in two wells were 80 to 100 feet above the top of the main Gordo aquifer. In two wells in the western part of Itawamba County, water levels measured in 2008 were more than 200 feet above the top of the main Gordo aquifer.

A total of 25 large-diameter wells have been issued permits to withdraw water from this aquifer. Of this total, 23 are public supply wells that are either in use or in a standby status. The depths of these wells range from 136 feet in the northeastern part of the county to 390 feet in western Itawamba County. Casing diameters range from 8 to 12 inches and reported pump capacities range from 25 to 400 gpm. The average pump capacity is 192 gpm.

In 2005, several public water systems reported withdrawals of water from the Gordo aquifer (fig. 10). The Town of Tremont maintained 2 wells, Northeast Itawamba Water Association used a total of 7 wells at two separate locations, the Town of Mantachie had 3 wells, and Houston-Palestine Water Association had 2 wells. The Town of Fulton reported that they purchased water from the Northeast Mississippi Regional Water District and maintained 1 well on standby and 4 others that were inactive. Tombigbee Water Association had 2 abandoned Gordo wells and reported that they also purchased water from the regional water district.

The most recently reported average withdrawals of water (2005) from large-diameter permitted wells screened in the Gordo aquifer totaled an estimated 563,704 gallons per day, all of it apparently pumped for public water supplies.

Non-pumping water levels were measured in 10 wells screened in this aquifer in 2008. Five of these wells were actively used public supply wells. The annual average rate of change observed in these wells has been small since the late 1980’s. Over this period, water levels declined in three wells with a maximum average rate of decline of about 0.33 feet per year in one well. Water levels in the other seven wells were observed to have risen since the late 1980’s, ranging from approximately 0.06 to 0.86 feet per year. In some cases, this increase is probably due to the cessation of pumping ground water.

In general, the central and western areas of the county are more favorable for development of water supplies from the Gordo aquifer than the area to the east, although the Gordo Formation may thicken or thin markedly from place to place, even in western Itawamba County.

Results of analyses of more than 50 water samples from wells in the Gordo aquifer in Itawamba County were reviewed. The total dissolved solids concentrations of these samples ranged from 24 to 207 ppm and averaged about 69 ppm. The water was generally soft, and iron and manganese were higher than the recommended concentration in most wells from which samples were available. Concentrations of iron ranged from zero to 15 ppm and averaged about 5.4 ppm, while concentrations of manganese were in a range from 0.002 to 0.552 ppm and averaged about 0.24 ppm. Excessive concentrations of iron and manganese in solution in the water appear to be a primary water quality issue of concern regarding the Gordo aquifer in Itawamba County. Values of pH reported for the samples reviewed ranged from 5.2 to 8.5 and averaged approximately 6.3. Analyses of a substantial number of water samples reported pH values of 6.3 or less accompanied by significant concentrations of carbon dioxide.

Eutaw and McShan Formations

The Eutaw and McShan Formations crop out at the surface of most of Itawamba County and dip westward into the subsurface beneath the Mooreville Chalk of the Selma Group, which is exposed at the surface along the Lee-Itawamba County line (fig. 3). As a unit, the Eutaw and McShan Formations generally thicken in a somewhat wedge-shaped manner across the county from east to west, although total thickness can be highly variable due to the effects of erosion. In the eastern part of the county, the Eutaw and McShan Formations are often less than 100 feet in thickness and are absent altogether at some locations where the underlying Gordo Formation is exposed. In areas of low elevation along the Tombigbee River, these formations are often thin or absent as a result of erosion, while in adjacent areas of higher elevation there may be a thickness of a bit more than 100 feet of these deposits preserved. In the western part of Itawamba County, as these units dip into the subsurface, there may be a total thickness of as much as 200 to more than 300 feet of Eutaw and McShan sediments present.

Boswell (1963) stated that the sands of the McShan are thin and irregular and are seldom used as a source of water, while most of the domestic wells in the county are screened in sands of the Eutaw Formation. The results of only one aquifer test have been published for the Eutaw-McShan aquifer in Itawamba County. This test produced a transmissivity value of 1,300 feet squared per day (Slack and Darden, 1991). Wasson (1986) published a regional map showing estimated general transmissivity trends in the Eutaw-McShan aquifer (fig. 8). In the eastern two-thirds of Itawamba County this publication rated this aquifer as having “poor” transmissivity, which was defined as being less than 1,000 feet squared per day. In the western third of the county, where the unit is thicker, it was rated as having “fair” transmissivity, which was defined as 1,000 to 5,000 feet squared per day.

A total of 3 large-diameter wells have been issued permits to withdraw water from this aquifer. All of these are public supply wells. The depths of these wells range from 148 to 305 feet, and all are in the western part of Itawamba County. Casing diameters range from 10 to 12 inches and reported pump capacities vary from 125 to 150 gpm. The average pump capacity is 142 gpm.

The only public water system that reported production of water from this aquifer in 2005 was Houston-Palestine Water Association with one well (fig. 10). Dorsey Water Association maintained two Eutaw-McShan wells on standby but reported that they purchased their water from the Northeast Mississippi Regional Water Supply District.

The recently reported (2005) total withdrawal of water from large-diameter permitted wells in this aquifer was estimated to be approximately 17,027 gallons per day, all of which was apparently pumped for public water supplies.

Non-pumping water levels were measured in 2008 in 3 wells screened in this aquifer, including 2 public water supply wells. The average rate of change observed in these wells for the period of record since the late 1980's for each is small. Water levels have been observed to be declining at rates of about 0.33 and 0.5 feet per year in two of these wells since 1988, while water levels have actually risen in another of these wells during that period.

Because of the greater saturated thickness available in the western part of Itawamba County, this area is generally more favorable for the development of wells in the Eutaw-McShan aquifer than the area of the county to the east where limited saturated thickness has restricted the use of this aquifer mainly to small-capacity, domestic wells.

Water quality information from this aquifer in Itawamba County is rather limited because so few water samples have been analyzed. The total dissolved solids concentrations of the samples that were available for review ranged from 42 to 337 ppm and averaged approximately 135 ppm. The water was generally moderately hard, and iron and manganese were higher than the recommended concentration in most wells from which samples were collected. Values of pH reported were as low as 5.0 and as much as 8.3 but averaged slightly over 7.0. Concentrations of iron ranged from 0 to 16.05 ppm and averaged slightly over 4 ppm, while concentrations of manganese were in a range from 0.065 to 0.54 ppm and averaged 0.27 ppm. Excessive concentrations of iron and manganese in solution in water from the Eutaw-McShan appear to be the primary water quality issue of concern regarding this aquifer in this county.

Coffee Sand Formation

The Coffee Sand is exposed on ridges in the northwestern corner of Itawamba County (fig. 3), generally in the area north of Twentymile Creek according to Vestal (1947). In this area, because of its limited saturated thickness and extent, this aquifer might locally be a source of water to shallow, small-capacity domestic wells but it is of no importance as an aquifer in the county.

Ground Water Resources of Prentiss County

Up to five geologic units may contain fresh water in this county as it is defined for the purposes of this report. From the oldest to the youngest deposits, these are Paleozoic rocks, the Gordo Formation, the Eutaw and McShan Formations, the Coffee Sand Formation, and the Ripley Formation. The Paleozoic rocks are not known to have been tested as a source of water, but might be a potential source of significant water supplies. The Eutaw-McShan and Gordo aquifers have been sources of supply to large-diameter wells and the Ripley and Coffee Sand aquifers have supplied small-capacity domestic and farm wells.

Paleozoic Rocks

No water wells are known to have produced water from Paleozoic rocks in Prentiss County, therefore the quantity and quality of water available from these rocks is unknown.

Jennings (1994) constructed a map showing the general area that various Paleozoic units subcrop beneath freshwater-bearing Cretaceous deposits. In the extreme western part of Prentiss County, the map shows Devonian rocks subcropping. In most of the county, rocks of the Iowa Group subcrop and in the southeastern corner of Prentiss County, rocks of the Pride Mountain Formation and the Hartselle Sandstone subcrop. For the most part, all of these Paleozoic rocks are overlain by the Gordo Formation in Prentiss County.

The Devonian chert and the Iowa Group have been sources of supply to water wells in Alcorn and Tishomingo Counties for years. Jennings stated that those units appeared to have significant potential to supply fresh water in other areas based upon delineation of regional subcrop geology, general assessment of porosity and permeability trends, and estimation of the concentration of total dissolved solids in the water within the rocks using geophysical well logs. Prentiss County was an area that was noted to be favorable for the potential development of fresh water from these rocks.

Jennings (1994) stated that, “The Devonian stratigraphic section in northeastern Mississippi consists of a thick interval of chert, cherty limestone, and minor shale of probable Early and Middle Devonian age that is overlain locally by thin Upper Devonian Chattanooga Shale.” He added that the Devonian chert exhibits high porosity and permeability in downdip areas adjacent to Alcorn County and that water quality estimates, empirically derived from geophysical log calculations, indicate the potential for fresh water (less than 1,000 ppm TDS) in the chert in downdip areas to depths of about 300 feet below mean sea level. Jennings included a map in his report showing that the Devonian chert may contain water of 1,000 ppm TDS or less in all of Prentiss County with the exception of the extreme southern part, and he included Prentiss County in the area in which these rocks probably have significant aquifer potential. The City of Corinth operates a number of water wells screened in the Devonian chert with reported pump capacities of 500 to 1,000 gallons per minute (gpm). It might be possible to develop wells of this size to pump water from these rocks in Prentiss County, but a drilling and testing program would be necessary at any location that would be selected to ascertain the quantity and quality of the water that might be available.

Regarding the Iowa Group, Jennings (1994) stated: "Chert and cherty limestone of the Mississippian Iowa Group form an important aquifer in northern Tishomingo and southeastern Alcorn counties." He added, "The area of greatest potential for utilization of the Iowa section as an aquifer is in a belt that extends from northern Lee County, across much of Prentiss County to southeastern Alcorn County and northern Tishomingo County." Jennings included a map in his report showing the Iowa subcropping beneath the Cretaceous sediments in most of Prentiss County with the exception of the westernmost area and the southeastern part. The City of Iuka in northern Tishomingo County has been obtaining water for years from wells screened in the Iowa Group. Some of these wells are reported to be capable of pumping from 700 to 840 gpm. It might be possible to develop wells of this size that could pump water from these rocks in Prentiss County, but, as in the case of the Devonian chert, a drilling and testing program would be necessary to make a determination.

Jennings (1994) discussed the aquifer potential of the Pride Mountain Formation and the Hartselle Sandstone in northeastern Mississippi. The Pride Mountain was characterized as having "poor aquifer potential due to the predominance of shales and the sparsity of sandstone or limestone intervals." He stated that, "Outcrops of the Hartselle Sandstone in Tishomingo County consist of tightly cemented sandstone and thin shale beds and the formation appears to have limited potential as an aquifer in Mississippi." He also noted that in counties of northwestern Alabama the Hartselle supplies water to a few low-yield (less than 5 gpm) wells. There is a well owned by the Town of Belmont in southern Tishomingo County that reportedly has a pump capacity of 400 gpm and is thought to be screened in Paleozoic rocks. No cuttings or geophysical logs from this well have been available to verify this and determine the geologic unit in which the well is screened. It is possible that this well is screened in the Bangor Limestone or in fractured Hartselle Sandstone, or it may be in large gravel deposited in a Gordo channel.

Gordo Formation

Parks (1960) stated that the Gordo Formation was only exposed in the southeastern part of Prentiss County in the beds of small creek branches flowing into Mackeys Creek where it is represented by several feet of carbonaceous gray clay.

Boswell (1963) noted that the Gordo was the source of water for two flowing irrigation wells in the lowlands of Big Brown Creek. He believed that the formation was "very thin or absent" in most of the county.

No aquifer test results have been published for wells screened in the Gordo in Prentiss County. A highly generalized map (fig. 7) showing regional trends of estimated aquifer transmissivity ratings for the Gordo aquifer was published by the USGS (Wasson, 1986). In Prentiss County, this map shows the Gordo absent in the northwest corner of the county and rated as “poor” (defined as less than 1,000 feet squared per day) in most of the county with the exception of the southeastern part in which it is rated as “fair” (defined as 1,000 to 5,000 feet squared per day).

Thicknesses of the Gordo Formation in Prentiss County were determined for those locations at which borehole geophysical logs were available. Frequently, boreholes did not extend through the full thickness of the Gordo. It is apparent that the thickness of the Gordo Formation varies considerably from one location to another as a result of its deposition over the irregular topography of the eroded surface of the underlying Paleozoic rocks. There also appears to be a general trend of thinning of the formation from the southeast toward the northwest. At a few sites in the eastern part of the county, thicknesses of 100 to 200 feet of Gordo may be present, while at other locations just a few miles away in this same area, the formation is less than 100 feet thick. In boreholes in the central part of the county, the Gordo was estimated to be as little as 18 feet thick and as much as 78 feet in thickness. In three wells in the Jumpertown area, the Gordo Formation is about 25 feet thick. There could easily be some locations in these areas of Prentiss County in which the Gordo is thinner than is noted here or even missing altogether.

A total of 11 large-diameter wells have been issued permits to withdraw water from this aquifer. Nine of these are classified as public supply wells. The reported depths of these wells range from 262 to 637 feet. Casing diameters range from 10 to 18 inches and reported pump capacities range from 203 to 1,000 gpm. The average pump capacity is about 514 gpm. The screens of some wells appear to be set through both Eutaw-McShan and Gordo aquifers.

The public water systems in Prentiss County with wells classified by MDEQ as being screened in the Gordo aquifer (fig. 11) reported withdrawals of water for calendar year 2005. The City of Booneville maintained 3 wells, Holcut-Cairo Water Association used 2 wells, the Town of Jumpertown had 2 wells, and New Site Water Association operated 2 wells.

The most recently reported (2005) average withdrawals of water from the Gordo aquifer in Prentiss County were estimated to be 1,878,985 gallons per day from large-diameter permitted wells. All of this water was pumped by public water systems.

Non-pumping water levels were measured in 8 wells in this aquifer in 2008. Five of these wells were public supply wells. The average annual rate of change observed in most of these wells since the late 1980’s was generally less than 0.4 feet per year, with the exception of two wells. Water levels in one well have been declining at a rate of about 1.74 feet per year since 1978 and in the other well at approximately 0.6 feet per year since 2007. Water levels in this latter well have not been measured for a sufficient length of time to determine a valid rate of change. Observations in two wells showed water levels rising or essentially unchanged while the other six wells showed declines.

Comparison of non-pumping water levels to the tops of the aquifer units in which wells were screened generally showed available drawdown space increasing the further west in Prentiss County a well was located. This is to be expected since the Gordo Formation is dipping deeper into the subsurface to the west. However, as previously stated, the Gordo appears to generally thin from the southeast toward the northwest. Because the thickness of the Gordo Formation is so variable in the county, it would be necessary to collect site-specific data to ascertain the presence of sufficient aquifer thickness coupled with enough available drawdown space to allow construction of large-capacity wells.

Results of analyses of 36 water samples from wells screened in the Gordo aquifer in Prentiss County were reviewed. The total dissolved solids concentrations of available samples ranged from 24 to 216 ppm and averaged about 131 ppm. From the available water samples, the water is soft to hard. Hardness appears to generally increase with depth of wells. Overall, concentrations of iron reported ranged from 0.02 to 20 ppm and averaged about 3.4 ppm. Concentrations of manganese were reported to range from 0.01 to 1.96 ppm and averaged about 0.31 ppm. Values of pH reported ranged from 6.0 to 8.0. Carbon dioxide has been reported in a limited number of water samples in concentrations that could cause the water to be corrosive. Concentrations of iron in excess of the recommended limit were present in approximately two-thirds of the samples for which iron was reported, indicating that treatment to reduce iron and possibly manganese in solution may be necessary and in some cases, reduction of hardness may be desirable.

Eutaw and McShan Formations

Regarding the outcrop area of the Eutaw Formation, Parks (1960) stated: “In Prentiss County the formation is represented by an outcrop area of some 7 or 8 miles in width in the southeastern part of the county and by only a few miles of outcrop in the northeastern corner (fig. 3). The eastern limits of the formation are not within the county; the western extension is bounded by an irregular line extending from a point near the northeastern corner of the county to a point near where State Highway 363 crosses the Itawamba County line.” Parks stated that: “In Prentiss County the McShan Formation is at the surface only on the lower slopes of creek branches in the southeastern part of the county.”

Boswell (1963) stated that the Eutaw Formation furnished water to most of the wells in the eastern half of Prentiss County while the McShan Formation was probably the source of water to just a few wells. He added that wells in the Eutaw range in depth from a few feet in the outcrop area to a maximum of nearly 500 feet in the Booneville and Baldwyn areas. In the western part of the county he noted that few wells penetrated the Eutaw because shallower aquifers were available. Boswell thought that the McShan Formation is thin and may be discontinuous in the subsurface.

Results of two aquifer tests conducted on wells screened in this aquifer have been published. Transmissivity values published from these tests were 800 and 1,300 feet squared per day (Slack and Darden, 1991). A highly generalized map (fig. 8) showing regional trends of estimated aquifer transmissivity ratings for the Eutaw-McShan aquifer was published by the USGS (Wasson, 1986). In Prentiss County, this map shows the Eutaw-McShan rated as “poor” (defined as less than 1,000 feet squared per day) in the extreme southeastern corner of the county and “fair” (defined as 1,000 to 5,000 feet squared per day) in the remainder of the county.

Thicknesses of the Eutaw and McShan Formations were determined for wells in Prentiss County from which borehole geophysical logs were available. In the outcrop area of the Eutaw Formation, thicknesses were variable due to erosion of parts of the section, being as little as 100 feet or less in some wells. In the area west of a line from Marietta to the northeastern corner of Prentiss County, interpreted total thickness of the combined Eutaw and McShan Formations from available logs was generally about 200 feet or more. This interval appeared to thin somewhat toward the northwest, being slightly less than 200 feet in total thickness in the wells in the Jumpertown area from which geophysical logs were examined.

A total of 21 large-diameter wells have been issued permits to withdraw water from this aquifer. All of these are public supply wells that are in use or maintained in a standby status. The reported depths of these wells range from 150 to 566 feet. Casing diameters range from 8 to 12 inches and reported pump capacities range from 90 to 590 gpm. The average pump capacity is about 234 gpm. The screens of some wells appear to be set through Eutaw-McShan and Gordo sands and the character of these deposits displayed in some borehole geophysical logs suggests that the Eutaw-McShan and Gordo aquifers may be naturally hydraulically connected in some locations in Prentiss County. The part of the county in which most of the wells screened in the Eutaw-McShan were listed as having pump capacities of 200 gpm or more was in the area from Baldwyn to Booneville to the vicinity of the Thrasher community.

In 2005, most public water systems in Prentiss County with wells that were classified by MDEQ as being screened in the Eutaw-McShan aquifer (fig. 11) reported withdrawals of water. The Town of Baldwyn maintained 3 wells, Ingram Water System maintained 1 well, Big V Water Association had 3 wells, the City of Booneville had 1 well, Holcut-Cairo Water Association had 1 well, the Town of Marietta maintained 2 wells, New Candler Water Association had 2 wells in use and another as a standby, Thrasher Water Association had 3 wells, and Wheeler-Frankstown Water Association maintained 4 wells.

The most recently reported average withdrawals of water (2005) from the Eutaw-McShan aquifer in Prentiss County for the water systems that responded to the survey yielded an estimated total pumpage of 1,211, 373 gallons per day from large-diameter permitted wells.

Non-pumping water levels were measured in 13 wells screened in this aquifer in 2008. Ten of these were public supply wells. The average annual rate of change observed in most of these wells since the late 1980’s or a more recent period of record was generally small, less than 0.25 foot per year, with the exception of four wells. Water levels observed in one well have apparently been declining at a rate of about one foot per year since 1998 and in the other three wells at approximately 0.5 foot per year since 1995.

Observations in three wells showed water levels rising, all of the others showed declines. Water levels collected during this survey generally indicated that more drawdown space was available between non-pumping water levels and the tops of the sands in which the wells were screened in the area from Baldwin through Booneville to the vicinity of Thrasher than in wells to the east. Drawdown space should be more favorable west of this area as the Eutaw and McShan Formations dip deeper into the subsurface.

Results of analyses of about 90 water samples from wells screened in the Eutaw-McShan aquifer in Prentiss County were reviewed. The total dissolved solids concentrations of these samples ranged from 32 to 287 ppm and averaged about 156 ppm. From the available water samples, the water is generally moderately hard to hard. Overall, concentrations of iron reported ranged from 0 to 11.5 ppm and averaged about 0.9 ppm. Values of manganese were reported to range from 0.037 to 0.509 ppm and averaged approximately 0.142. Values of pH ranged from 5.7 to 8.3. In a limited number of samples, carbon dioxide was reported in concentrations sufficient to produce corrosive water. Concentrations of iron were higher than the recommended limit in about 45 percent of the samples, indicating that treatment to reduce iron in solution may be necessary in some cases and reduction of hardness may also be desirable

Coffee Sand Formation

The Coffee Sand crops out in the northeastern and central parts of Prentiss County (fig. 3) in a south-southwest trending belt that is about 8 to 10 miles wide (Parks, 1960). Parks stated that, “Its eastern limit can be marked by an irregular line from a point near the northeastern corner of the county at the Tishomingo County line to a point on the westward facing slope of Donivan Creek at the Itawamba County line. Its westward limit somewhat parallels the Gulf, Mobile and Ohio Railroad and is represented by an irregular line from a point about a mile east of U.S. Highway 45 at the Alcorn County line to a point on the Lee County line at Baldwyn.” This formation overlies the Eutaw Formation and, west of Booneville, is overlain by the Demopolis Chalk as it dips westward into the subsurface. It consists of fine to medium sand, clay, and shale.

Boswell (1963) stated that the Coffee Sand is probably the source of water for most of the domestic and farm wells in the central and western parts of Prentiss County. He noted that the depth of wells in this formation range from as little as 100 feet at Booneville to as much as 400 feet in the western part of the county.

Ellison and Boswell (1960) stated that the water from this aquifer in Prentiss County is low in dissolved solids, usually has high iron content, and ranges from moderately hard to very hard. They noted the presence of flowing wells in the valley of the tributaries of Twenty Mile Creek.

No aquifer test results have been published for this aquifer in Prentiss County. A highly generalized regional map (fig. 9) showing estimated transmissivity trends was included in a USGS publication prepared by Wasson (1986). This map depicts the Coffee Sand in its outcrop area having generally “poor” transmissivity, which was defined as less than 1,000 feet squared per day. In the area of the county to the west of the Coffee Sand outcrop area, the aquifer is shown as having “fair’ transmissivity, which was defined as 1,000 to 5,000 feet squared per day.

Thicknesses of the Coffee Sand Formation as interpreted from available borehole geophysical logs are highly variable. The formation is less than 100 feet thick in eastern Prentiss County near the updip edges of its outcrop area, with as little as 25 feet being noted in a well in the northeastern part of the county. In some parts of eastern and particularly southeastern Prentiss County, the Coffee Sand is not present at all and the Eutaw, McShan, or Gordo Formations are exposed at the surface. Although overall thickness of the formation varies in the area of outcrop as a result of erosion, the Coffee Sand generally thickens toward the west-northwest. Thicknesses of 200 feet or more were noted in central Prentiss County, generally from the vicinity of Wheeler through Booneville to the Thrasher area and further west in the area of Jumpertown. Conditions for development of wells in the Coffee Sand in Prentiss County are most favorable in the western part of the county, downdip from the outcrop area, where maximum saturated thickness and drawdown space should be available. Even in this area, it must be noted that the USGS considers the aquifer to be no better than “fair’ with regard to transmissivity.

No large-diameter wells have been issued permits to withdraw water from the Coffee Sand in Prentiss County, no pumpage information is available, and no public water systems are known to obtain water from this unit.

Recently measured (2008) non-pumping water levels were available from only two wells screened in the Coffee Sand in this county. Apart from normal seasonal fluctuations that could be expected for water levels from shallow wells located in or near the outcrop area, little long-term change has been observed. The maximum rate of change was only about 0.2 feet per year in one well since 1993. This is not unexpected given the proximity to recharge and the apparent lack of significant withdrawals of water.

Water quality information from the Coffee Sand in Prentiss County is limited because so few water samples have been analyzed. The total dissolved solids concentrations for the samples that were available for review ranged from 102 to 290 ppm and averaged approximately 205 ppm. The results of analysis of the few water samples available showed that the water ranged from soft to hard. Water from wells deeper than 300 feet tended to be hard, but sampling is not sufficient to establish a definite trend. Concentrations of iron ranged from 0.06 to 15 ppm and averaged about 4.9 ppm. No results for concentrations of manganese were available for any water samples. Excessive concentrations of iron in solution in water from the Coffee Sand aquifer appear to be the primary water quality issue of concern regarding this aquifer in Prentiss County.

Ripley Formation

The Ripley Formation is composed of sand, sandstone, clay, and shale. It is exposed at the surface in the northwestern corner of Prentiss County and southward near the western county line (fig. 3). It has been a source of water to shallow dug and bored wells in the outcrop area but is of no significance as a source of water in the county because of its limited extent and saturated thickness. Results of analysis of one water sample were available for review. The reported pH value was 5.6, total dissolved solids were 221 ppm, and iron was 0.07 ppm.

Ground Water Resources of Tishomingo County

Four geologic units contain fresh water as it is defined for the purposes of this report in parts of the county. These are, from the oldest to the youngest deposits: Paleozoic rocks, the Gordo Formation, the Eutaw and McShan Formations, and the Coffee Sand Formation.

Paleozoic Rocks

Tishomingo County is the only part of Mississippi in which Paleozoic rocks are exposed at the surface (fig. 3). Merrill, et al (1988) mapped the surface geology of the county, reporting the Devonian Ross Formation and Chattanooga Shale cropping out on the shore of parts of Pickwick Lake. They stated that the Fort Payne and Tuscumbia Formations of the Mississippian Iowa Group are exposed in the northern and central areas of Tishomingo County and the Pride Mountain Formation and Hartselle Sandstone are also present at the surface in central and southern parts of the county.

Paleozoic rocks also underlie the Cretaceous and younger deposits in Tishomingo County. Merrill, et al (1988) stated: “Because the Paleozoic rocks generally dip to the south at a greater rate than the slope of the eroded Paleozoic surface, progressively younger Paleozoic formations occur beneath the Cretaceous section from north to south.”

Jennings (1994) published a map showing that the Devonian chert, subcropping beneath younger Paleozoic rocks, might contain water with total dissolved solids of 1,000 ppm or less in the extreme western portions of Tishomingo County with the exception of the southernmost area of the county. This estimate was based upon interpretation of borehole geophysical logs since no wells are known to have obtained water from these rocks. The rocks are primarily chert and cherty limestone and are a significant source of water in parts of Alcorn County, particularly in the Corinth area. It is believed that fractures are a significant factor in the development of the aquifer potential of these rocks.

Jennings stated that the Devonian chert exhibits high porosity and permeability in downdip areas adjacent to Alcorn County and that water quality estimates, empirically derived from geophysical log calculations, indicate the potential for fresh water (less than 1,000 ppm TDS) in the chert in downdip areas to depths of about 300 feet below mean sea level and he included part of Tishomingo County in the area in which these rocks have significant aquifer potential. The City of Corinth operates a number of water wells screened in the Devonian chert with reported pump capacities of 500 to 1,000 gpm. It may be possible to develop wells of this size to pump water from these rocks at some locations in western Tishomingo County, but a drilling and testing program would be necessary at any location that would be selected to ascertain the quantity and quality of the water that might be available.

The Iowa Group is shown on Jennings' map to subcrop beneath freshwater-bearing Cretaceous and younger sediments in northern and central Tishomingo County. He stated that the Iowa Group is over 400 feet thick in part of Tishomingo County. Jennings described the Iowa in the following statements: "Outcrops of highly weathered, fractured, and porous Fort Payne and Tuscumbia chert beds are common in northern Tishomingo County, and the Fort Payne subcrops at relatively shallow depths in the Iuka area." He added: "The Iowa section is a significant aquifer in northern Tishomingo and eastern Alcorn counties, providing the principal water supply for Iuka, Short-Coleman Water Association, and the Alcorn Water Association wells near Glens and Jacinto. Groundwater withdrawn at Burnsville comes principally from the Iowa but probably also comes from the overlying Tuscaloosa gravels as evidenced by high dissolved iron content, a common characteristic of Tuscaloosa ground water. The wells at Iuka are probably screened in the upper part of the Fort Payne chert." He noted that the Fort Payne and Tuscumbia formations contain significant aquifers in northwestern Alabama in Colbert and Lauderdale counties. Jennings concluded that porosity and permeability in rocks of the Iowa Group are usually low or occur only in thin, discontinuous zones in areas downdip from the areas of outcrop and subcrop. Thus the Iowa apparently has the greatest potential for aquifer development primarily in these outcrop and subcrop areas.

Jennings' map shows the Pride Mountain Formation outcropping and subcropping across part of central and southern Tishomingo County, the Hartselle Sandstone outcropping and subcropping across the southern part of the county, and the Bangor Limestone subcropping across the southeastern corner. He described the Pride Mountain Formation as having poor aquifer potential because it mainly consists of shales and porous sandstone and limestone intervals occur sparsely. The Hartselle in Tishomingo County was described as tightly cemented sandstone with thin shale beds and it was considered to have limited potential as an aquifer in Mississippi. Jennings noted that the Hartselle was a source of water to a few low-yield wells (less than 5 gpm) in adjacent counties of northwestern Alabama. The Bangor was described as limestones interbedded with shales. Jennings stated that the Bangor Limestone is not known to be a source of water to wells in Mississippi but it does supply water to low-yield wells (less than 100 gpm) in Colbert and Franklin counties, Alabama. He stated that the greatest potential for development of significant fresh water-bearing intervals in the Bangor in Mississippi would probably be found where porous beds subcrop beneath Tuscaloosa gravels. There is a well owned by the Town of Belmont in southern Tishomingo County that reportedly has a pump capacity of 400 gpm and is thought to be screened in Paleozoic rocks. No cuttings or geophysical logs from this well have been available to verify this and determine the geologic unit in which the well is screened. It is possible that this well is screened in the Bangor Limestone or in fractured Hartselle Sandstone, or it may be in large gravel deposited in a Gordo channel.

The U. S. Geological Survey has published the results of three aquifer tests of wells in Tishomingo County that are screened in Paleozoic rocks (Slack and Darden, 1991). Transmissivity values derived from these tests were 5,630, 100, and 5 feet squared per day. This extreme variation in the ability of these rocks to transmit water is probably related to the degree to which the surface area of the rock adjacent to the screened interval of the well was cut by significant fractures. The extent of fracture development could vary considerably both laterally and vertically over a short interval. This illustrates the necessity of a program to drill and test target zones to be certain that a sufficient water supply is available before proceeding with an attempt to withdraw a substantial volume of water from Paleozoic rocks. Regarding the Paleozoic rocks, Wasson and Tharpe (1975) stated: “Test drilling in several areas of Tishomingo and Alcorn Counties has shown that original geologic deposition, or weathering, or both, can change abruptly between sites that lie no more than a thousand feet apart.”

A total of 13 large-diameter wells have been issued permits to withdraw water from Paleozoic rocks in this county. All of these wells were constructed for the purpose of public water supply. The reported depths of these wells range from 100 to 405 feet. Casing diameters range from 6 to 16 inches and reported pump capacities vary from 20 to 750 gpm. The average pump capacity is approximately 356 gpm.

Several public water systems reported withdrawals of water from wells in Paleozoic rocks in this county for 2005 (fig. 12). The Town of Belmont had 1 well, the Town of Burnsville maintained 2 wells, the City of Iuka used 5 wells, Short-Coleman Park Water Association had 3 wells in use, and Tishomingo State Park had 2 standby wells. The total reported average daily pumpage estimated for 2005 from large-diameter Paleozoic wells in Tishomingo County was approximately 1,815,000 gallons per day, all for public supply.

Non-pumping water levels were measured in 7 wells screened in Paleozoic rocks in 2008. Five of these were owned by public water systems, one was at Tishomingo State Park, and the other was a Corps of Engineers observation well near the Tennessee-Tombigbee Waterway. Water level trends were assessed for the period of record available for each of these wells since the late 1980’s. Water level trends observed in six of these wells showed average rates of decline ranging from about 0.17 to 0.68 feet per year and averaged approximately 0.44 feet per year. One well at Iuka showed a rate of decline of about 1.7 feet per year for the period from 1998 to 2008, but the most recently measured non-pumping water level in this well was more than 180 feet above the reported top of the well screen.

Results of analyses of more than 40 water samples from wells pumping water from Paleozoic rocks in Tishomingo County were reviewed. The total dissolved solids concentrations of these samples were low, ranging from 14 to 157 ppm and the water was generally soft. The pH values reported ranged from 5.2 to 7.8 and averaged about 6.1. Notable concentrations of carbon dioxide were reported in a number of samples analyzed. Concentrations of iron in solution varied. Many water samples had concentrations of iron of only 0.1 ppm or less but approximately one-third of available samples contained 1.0 ppm or more. The actual range observed was 0 to 17 ppm. As Jennings stated, iron may be moving into the Paleozoic rocks from the overlying Tuscaloosa deposits in the vicinity of some of these wells. In samples from some wells, manganese was present in excess of recommended concentrations. Excessive concentrations of iron and low pH appear to be the most common water quality issues of concern regarding the Paleozoic rocks in Tishomingo County.

Gordo Formation

Sediments of the Gordo Formation are exposed at the surface generally in the eastern part of Tishomingo County (fig. 3). Merrill et al (1988) found that the Gordo dips toward the west at a rate of 25 to 30 feet per mile and overall thickness of the formation is highly variable, ranging from 0 to 400 feet. This variability in thickness is the result of deposition of the Gordo over the irregular topography of the eroded surface of the Paleozoic rocks.

Boswell (1963) presented a summary of information regarding the Gordo Formation in Tishomingo County in the following paragraph: "The Gordo Formation is the oldest unit of Late Cretaceous age in the county and the sand and gravel crops out in many places. The lithology and thickness of the formation is extremely variable, but wells for several municipal water supplies in the county have been developed in the sand and gravel. The Gordo Formation contains the only Cretaceous aquifer in the eastern half of the county. Dug and bored wells are usual in the outcrop area of the Gordo Formation and drilled wells do not generally exceed a depth of 150 feet at any place. In the northwestern part of the county the Gordo Formation occurs irregularly in the subsurface and it is probably not present in the extreme northwest corner."

Merrill, et al (1988) noted that these sediments are composed mainly of fine to coarse gravel beds interbedded with fine- to coarse-grained sands and clay beds. In this report, the authors stated that lenses of gravel, sand, and clay occurred discontinuously throughout the Gordo Formation and bedding is irregular and the resulting heterogeneity coupled with the great local variation in thickness of this formation produces a wide range in aquifer hydraulic characteristics. They added that locally, thick beds of clay may hydraulically separate beds of sand and gravel resulting in the occurrence of more than one aquifer within the Gordo Formation.

The U. S. Geological Survey published the results of three aquifer tests of wells in Tishomingo County screened in the Gordo aquifer (Slack and Darden, 1991). Transmissivity values derived from these tests were 1,600, 360, and 350 feet squared per day. Merrill, et al stated that Simmons (1985), in his report on the Corps of Engineers' study of the Tennessee-Tombigbee Divide Cut, found that transmissivity values ranged from 1,800 to 14,000 gallons per day per foot which is approximately equivalent to 240 to 1,870 feet squared per day. Wasson (1986) included a regional map showing estimated general transmissivity trends for the Gordo aquifer in his report (fig. 7). This map rates the Gordo as having "poor" transmissivity (defined as being less than 1,000 feet squared per day) in most of its area of occurrence in Tishomingo County with the exception of a small area of the west-central part of the county in which it is rated as having "fair" transmissivity (defined as 1,000 to 5,000 feet squared per day).

A total of 27 large-diameter wells have been issued permits to withdraw water from the Gordo aquifer in this county. Of this number, 26 wells are owned by public water systems although not all are in use at the time of this writing. The depths of these wells range from 89 to 400 feet but only 3 wells are greater than 200 feet deep. Casing diameters range from 6 to 16 inches and reported pump capacities vary from 50 to 500 gallons per minute. The average pump capacity is about 128 gallons per minute.

Several public water systems reported withdrawals of water from the Gordo aquifer in this county for 2005 (fig. 12). The Town of Belmont maintained 1 active well, 4 standby wells, and 3 inactive wells, Dennis Water Association had 9 wells, the Town of Golden operated 3 wells, Midway-Pleasant Hill Water Association listed 1 well which was apparently unused, Short-Coleman Park Water Association maintained 1 well, and the Town of Tishomingo had 1 active well and 3 standby wells. The total reported average daily pumpage from this aquifer from large-diameter wells in 2005 was estimated to be approximately 872,690 gallons per day for public supplies and 1,767 gallons per day for industrial use.

Non-pumping water levels were measured in 13 wells screened in this aquifer in 2008. Seven of these were owned by public water systems and six were Corps of Engineers observation wells near the Tennessee-Tombigbee Waterway. Water level trends were assessed for the period of record available for each of these wells since the late 1980's. Observations of non-pumping water levels have shown a net rise in seven of the wells during the period reviewed. Water level trends observed in four of the other wells showed an average annual decline of less than one foot per year. In the other two wells, water levels declined at an average rate of about 1.5 feet per year since 2000 in one and approximately 1.0 foot per year since 1997 in the other. In one public supply well in southern Tishomingo County, the non-pumping water level was within the screened interval of the well. The rate of decline of the water level in this particular well was also the highest observed in the county. In two other public supply wells in the southern part of the county in which non-pumping water levels were measured in 2008, the level was less than 10 feet above the top of the screen in one and within 20 feet above the top in the other.

Results of analyses of more than 90 water samples from wells in the Gordo aquifer in Tishomingo County were reviewed. The total dissolved solids concentrations of these samples were very low, ranging from 12 to 87 ppm and the water was generally soft. The pH values reported ranged from 4.6 to 9.3, with most samples reviewed having a pH less than 7.0, averaging approximately 5.9. Notable concentrations of carbon dioxide were reported in samples from a number of wells. Concentrations of iron and manganese in solution were highly variable in analyses of the water samples reviewed. Iron ranged from 0 to 20 ppm and manganese ranged from 0.001 to 1.35 ppm. Manganese was present in excess of 0.05 ppm in only a few water samples while concentrations of iron reported in solution were less than 0.3 ppm in approximately three-quarters of the samples reviewed but were present in objectionable concentrations in the other samples. Generally low pH and excessive iron in solution in at least some locations appear to be the most noteworthy water quality issues of concern regarding the Gordo aquifer in Tishomingo County.

Eutaw and McShan Formations

Sediments of the Eutaw and McShan Formations are exposed at the surface over a large part of Tishomingo County (fig. 3) although Merrill, et al (1988) did not consider the McShan to be present in an area representing approximately the northern third of the county. These units dip generally toward the west beneath the Coffee Sand and are underlain by the Gordo Formation and Paleozoic rocks. Merrill, et al described these deposits as a unit consisting of fine sands and clays. The overall thickness of this interval ranges from 0 to more than 200 feet. In the outcrop area, erosion results in great variability in thickness from one location to another. A number of borehole geophysical logs from wells in Tishomingo County were examined as well as published records of test holes drilled by Merrill, et al. Generally, the greatest total thickness of the combined Eutaw and McShan section was found to occur in an area in the westernmost part of the county from the vicinity of Paden northward to Burnsville. Even in this area erosion can cause drastic thinning of this interval from one location to another.

Merrill, et al said, “The McShan is composed of light colored, glauconitic, fine-grained sands interbedded with abundant silt and clay lenses. Although the McShan is generally not considered a good aquifer because of its fine-grained texture, the formation locally is very sandy and probably stores and transmits significant quantities of ground water. The McShan thins northward, eventually pinching out in the northern part of the county.” Boswell (1963) stated that the Eutaw Formation crops out in the western half of the county and occurs at higher altitudes in the eastern part. The Eutaw Formation has been described as consisting of a lower unit composed of fine- to medium-grained, micaceous sands with abundant interbeds of medium gray clay and an upper unit, the Tombigbee Sand, composed of fine- to medium-grained, well sorted, massively bedded sand with minor silt and clay.

Boswell (1963) stated that the McShan Formation is too thin and irregular to contain an important aquifer although it may be a source of water for some shallow wells in the southern part of the county. At the time he wrote the report he thought that the basal sand of the Eutaw Formation was the most important aquifer in the part of the county west and northwest of Mackeys Creek and Yellow Creek and for shallow wells as far east as Paden and Iuka. He stated that the Tombigbee Sand was the source of water for shallow wells west of a line through Holcut and Burnsville.

In discussing the utilization of the Eutaw-McShan aquifer in Tishomingo County, Merrill, et al stated: “The Eutaw aquifer is not utilized by the large-yield, public-supply wells but is a significant source of water in many shallow (generally less than 200 feet depth) domestic wells.” They added, “Yields are generally low, averaging less than 10 gpm for most domestic wells. However, some yields of over 200 gpm have been recorded by the U. S. Corps of Engineers in test wells in the Eutaw. The generally lower quantitative aquifer coefficients of the Eutaw are primarily the result of the general fine-grained nature of the sediments and the complex intertonguing and lamination of clays and sands. Simmons (1985) concluded that the Eutaw and Tuscaloosa aquifers are locally hydraulically connected."

No published aquifer test data was available for this aquifer in Tishomingo County. Wasson (1986) published a highly generalized map showing estimated transmissivity ratings for the Eutaw-McShan aquifer in northeast Mississippi (fig. 8). In most of its area of occurrence in Tishomingo County the map rates this aquifer as having "poor' transmissivity, which is defined as less than 1,000 feet squared per day. In a small area of west-central Tishomingo County along the border with Alcorn and Prentiss Counties the map shows the Eutaw-McShan as having a transmissivity rating as "fair", which is defined as 1,000 to 5,000 feet squared per day.

No large-diameter wells are currently operating with permits from MDEQ in Tishomingo County and no public water systems withdraw water from this aquifer. Information regarding withdrawal of water from the Eutaw-McShan aquifer is not available but the total volume of water pumped from this aquifer is probably small.

Non-pumping water levels were measured in 2008 in 5 wells screened in this aquifer in Tishomingo County. All of these wells were maintained for observation by the U. S. Army Corps of Engineers. The average rate of change observed in these wells for the period of record available since the late 1980's is small. Water levels appear to be rising at rates from about 0.024 to 0.04 feet per year in 4 wells and declining at a rate of approximately 0.17 feet per year in the other. This represents a small sampling of wells in the Eutaw-McShan aquifer in the county and there is no way to be sure how representative this set of water level data could be. Because of the fact that the Eutaw and McShan Formations crop out in a large area of Tishomingo County and receive recharge from precipitation on the land surface and there are no known significant withdrawals of water from this aquifer in the county, it could be expected that very little long-term change in water levels would be occurring.

Data from 79 water samples of Tishomingo County wells screened in the Eutaw-McShan was reviewed. The total dissolved solids concentrations of the samples available for review ranged from 35 to 170 ppm and averaged approximately 66 ppm. The water was generally soft. Concentrations of fluoride determined for these water samples were normally 0.3 ppm or less but results reported for one sample showed a value of 4.8 ppm. This result appears to be anomalous and may be an error. The pH values determined for the available water samples ranged from 4.6 to 7.6 with an average value of about 5.8. Concentrations of iron reported in solution ranged from 0 to 25 ppm and averaged about 4.4 ppm. Excessive concentrations of iron in solution and low pH appear to be the most prevalent water quality issues of concern.

Coffee Sand Formation

Merrill, et al (1988) described the Coffee Sand Formation in Tishomingo County as thinly bedded, fine- to medium-grained sand and silty clay with thickness ranging from 0 to a maximum of 150 feet. It is exposed at the surface and is largely restricted to northwestern and west-central areas of the county (fig. 3). This aquifer is a source of water to shallow domestic wells in this part of Tishomingo County, but it is generally not a source of significant water supplies due to its limited extent and saturated thickness. An analysis of one water sample collected from a well screened in this aquifer was reviewed. Results reported for this sample were limited to just a few parameters, but found that the water was soft and pH was 5.2. Values of iron and manganese were not reported.

SELECTED REFERENCES

Bicker, A. R., Jr., 1969, Geologic map of Mississippi: Mississippi Geological Survey.

Boswell, E. H., 1963, Cretaceous aquifers of northeastern Mississippi: Mississippi Board of Water Commissioner's Bulletin 63-10, 202 p.

Boswell, E. H., 1977, The Eutaw-McShan aquifer in Mississippi: U.S. Geological Survey Water-Resources Investigations Map 76-134.

Boswell, E. H., 1978, The Tuscaloosa aquifer system in Mississippi: U.S. Geological Survey Water-Resources Investigations Map 78-98.

Boswell, E. H., 1979, The Coffee Sand and Ripley aquifers in Mississippi: U.S. Geological Survey Water-Resources Investigations Map 78-114.

Boswell, E. H., Moore, G. K., MacCary, L. M., and others, 1965, Cretaceous aquifers in the Mississippi embayment, with discussions of quality of the water by H. G. Jeffery: U.S. Geological Survey Professional Paper 448-C, 37 p.

Ellison, B. E., and Boswell, E. H., 1960, Groundwater resources of Prentiss County, Mississippi: Mississippi Geological Survey Bulletin 87, 44 p.

Gandl, L. A., 1982, Characterization of aquifers designated as potential drinking-water sources in Mississippi: U.S. Geological Survey Water-Resources Investigations Open-File Report 81-550, 90 p.

Jennings, S. P., 1994, Hydrogeology and aquifer potential of the Paleozoic rocks of northeastern Mississippi: Mississippi Department of Environmental Quality, Office of Land and Water Resources, Hydrologic Investigations Report 94-1, 54 p.

Jennings, S. P., 1996, Stratigraphic test hole drilling project in northeastern Mississippi – data and results: Mississippi Department of Environmental Quality, Office of Land and Water Resources, Open File Report 96-101, 27 p.

Lang, J. W., and Boswell, E. H., 1960, Public and industrial water supplies in a part of northern Mississippi: Mississippi Geological Survey Bulletin 90, 104 p.

Merrill, R. K., Gann, D. E., and Jennings, S. P., 1988, Tishomingo County geology and mineral resources: Mississippi Bureau of Geology Bulletin 127, 178 p.

Parks, W. S., 1960, Prentiss County geology: Mississippi Geological Survey Bulletin 87, 110 p.

Shows, T. N., 1970, Water resources of Mississippi: Mississippi Geological Survey Bulletin 113, 161 p.

Simmons, M. D., 1985, Unwatering the Divide Cut of the Tennessee-Tombigbee Waterway: a major challenge to construction: Environmental Geology and Water Sciences, v. 7, no. 1 and 2, p. 51-67.

Slack, L. J., and Darden, D., 1991, Summary of aquifer tests in Mississippi, June 1942 through May 1988: U. S. Geological Survey, Water Resources Investigations Report 90-4155, 40 p.

Strom, E. W., 1998, Hydrogeology and simulation of ground-water flow in the Cretaceous-Paleozoic aquifer system in northeastern Mississippi: U.S. Geological Survey Water-Resources Investigations Report 98-4171, 81 p.

U. S. Environmental Protection Agency, 1977, National secondary drinking water regulations: Federal Register, 42:17144, March 31, U.S. Government Printing Office, Washington, D.C.

U. S. Public Health Service, 1962, Drinking water standards, 1962: U. S. Public Health Service Pub. 956, 61 p.

Vestal, P. E., 1947, Itawamba County mineral resources: Mississippi Geological Survey Bulletin 64, 151 p.

Wasson, B. E., 1986, Sources for water supplies in Mississippi: Mississippi Research and Development Center Bulletin, 113 p.

Wasson, B.E., and Tharpe, E. J., 1975, Water for industrial development in Alcorn, Itawamba, Prentiss, and Tishomingo counties, Mississippi: Mississippi Research and Development Bulletin, 60 p.

OTHER SOURCES OF INFORMATION

Office of Land and Water Resources Water-Use Program data files.

Office of Land and Water Resources Groundwater Permitting files.

Office of Land and Water Resources Potentiometric Mapping Program water-level data files.

U.S. Geological Survey water quality files, geophysical log files, and well schedules.

APPENDICES

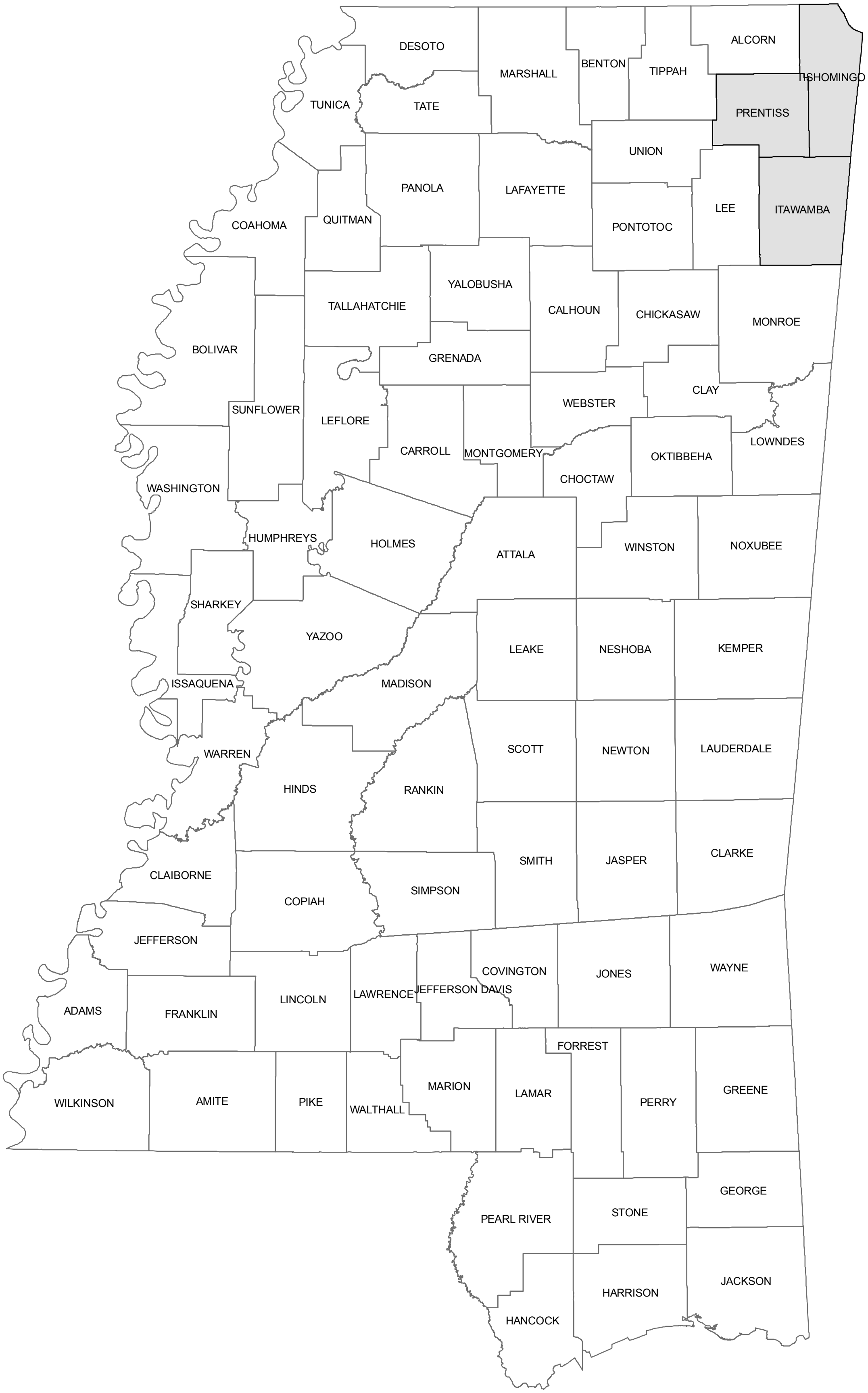


Figure 1: Location of Study Area

Figure 2: Geologic Units and Their Water-Bearing Character

(Modified from Wasson and Tharpe, 1975)

Era	System	Series	Group	Geologic unit	Thickness (ft)	Lithology and extent	Water-bearing character
Cenozoic	Quaternary	Holocene		Alluvium	0-30	Clay, silt, sand, and gravel; basal part generally coarser. Underlies flood plains of larger streams.	The alluvium generally will yield less than 100 gal/min to wells. Calcium bicarbonate water, low in dissolved solids.
		Pleistocene		Terrace deposits	0-50	Clay, silt, sand, and gravel;basal part generally coarser. Adjacent to flood plains. Caps some high hills.	Very poor aquifer. Calcium bicarbonate water, very low in dissolved solids.
Mesozoic	Cretaceous	Upper Cretaceous	Selma	Ripley Formation	0-200	Sand, fine- to coarse-grained, calcareous; interbedded with clay and silt. Crops out in western Prentiss County.	Shallow domestic and farm wells tap the Ripley.
				Demopolis Chalk	0-250	Chalk, compact, blue-gray, argillaceous. Crops out in a north-south belt in western Prentiss County.	Not an aquifer.
				Coffee Sand	0-250	Sand, fine- to medium-grained, calcareous, glauconitic; interbedded silt and clay. Crops out in the central part of the area.	Many shallow domestic and farm wells have used the Coffee Sand.
				Moorevile Chalk	0-100	Chalk and calcareous clay. Crops out in Itawamba County only. Interfingers with Coffee Sand in Prentiss County in subsurface.	Not an aquifer.
				Eutaw Formation (Includes McShan Formation in lower part)	0-300	Upper part, Tombigbee Sand Member of Eutaw Formation--Sand beds are massive-bedded, fine, glauconitic, calcareous. Middle part -- Sand beds are fine- to medium-grained, glauconitic, interbedded with clay. Lower part, McShan Formation -- Sand beds are fine, glauconitic, micaceous; with thin beds of gray clay. The McShan Formation thins northwestward.	Tapped by many domestic wells. Yields up to 500 gal/min to some public water-supply wells.
			Tuscaloosa	Gordo Formation	0-300	Gravel, chert, white to tan, mixed with quartz sand and white or pink clay; or interbedded with sand and clay. Crops out in eastern part of area. Thins to northwest across Prentiss County.	The source of water for many large-capacity wells in the area.
Paleozoic				Paleozoic rocks, undifferentiated		Limestone, chert, sandstone, and shale to undetermined depths.	Generally will not yield significant quantities of water except where highly weathered or fractured. Wells at Corinth and Iuka yield as much as1,000 gal/min.

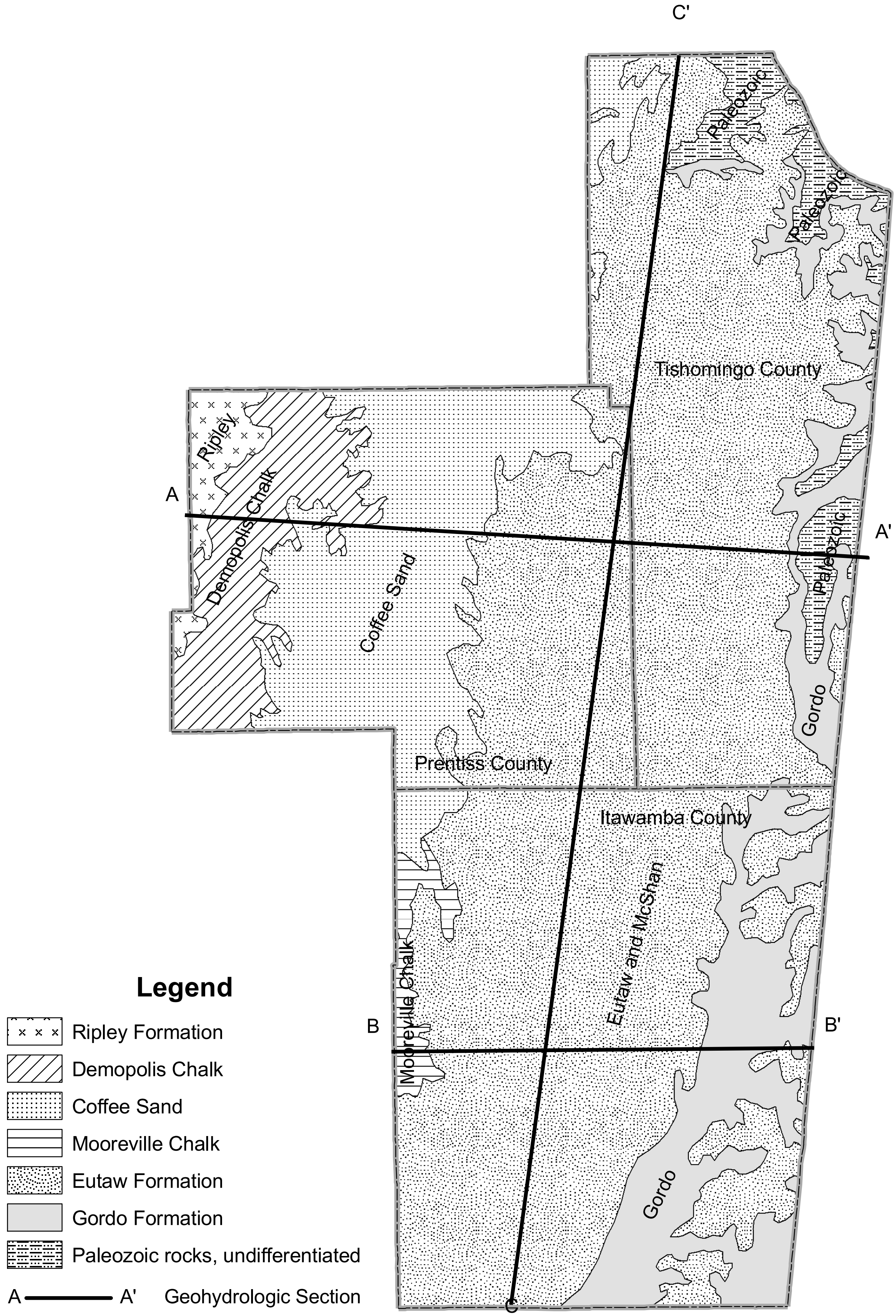


Figure 3: Areal Geology and Location of Geohydrologic Sections (from Wasson and Tharpe, 1975)

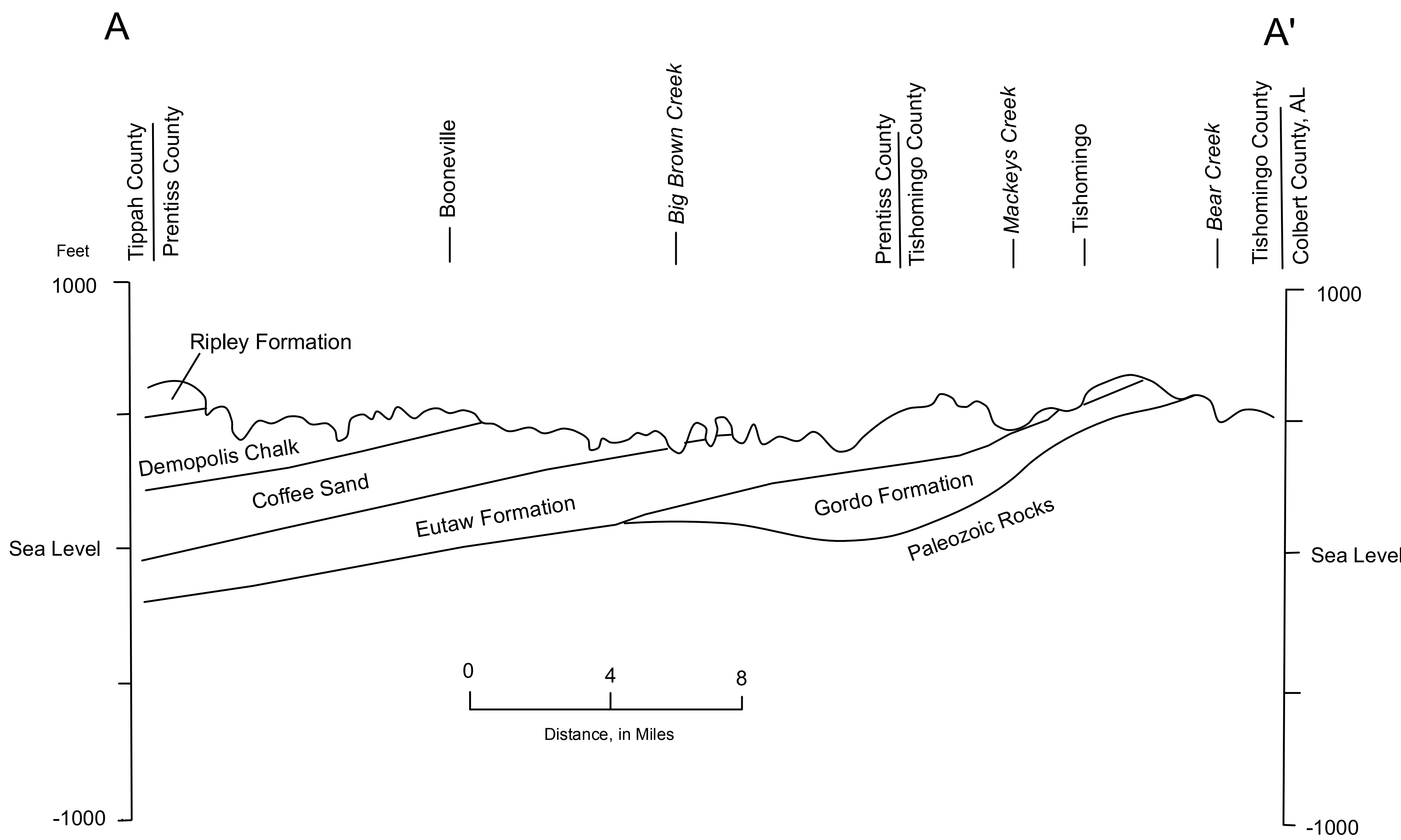


Figure 4: Geohydrologic Section Through Booneville and Tishomingo (from Wasson and Tharpe, 1975)

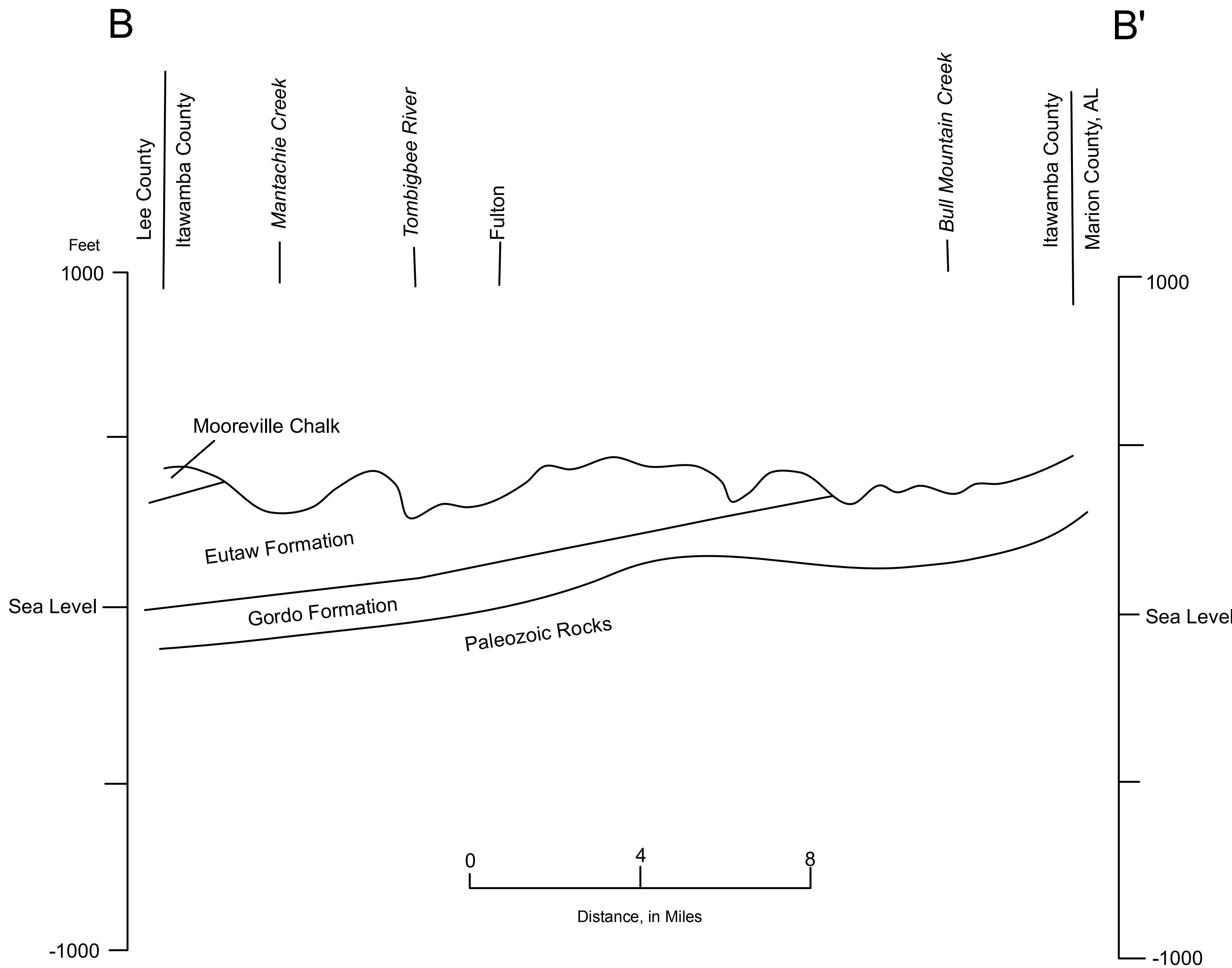


Figure 5: Geohydrologic Section East-West Through Fulton (from Wasson and Tharpe, 1975)

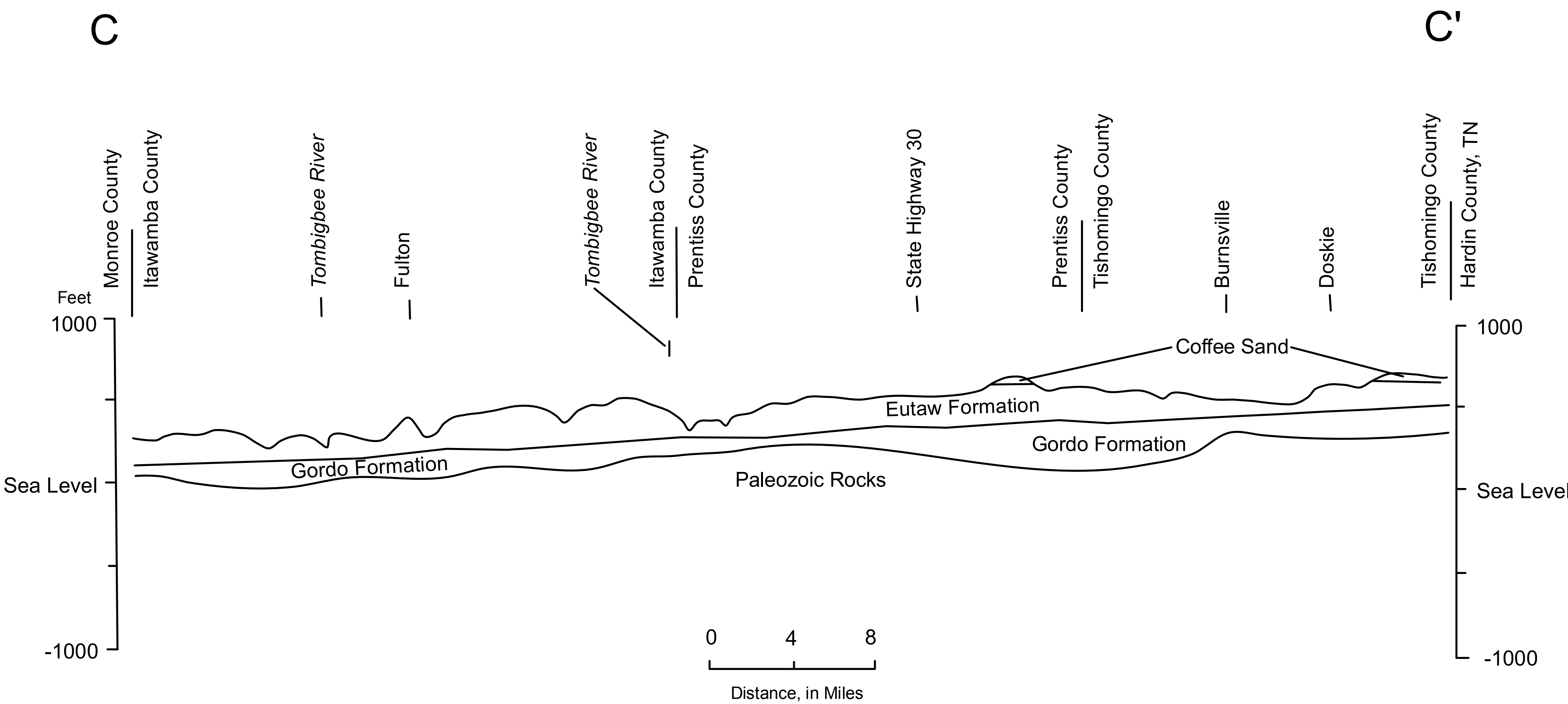


Figure 6: Geohydrologic Section North-South Through Fulton (from Wasson and Tharpe, 1975)

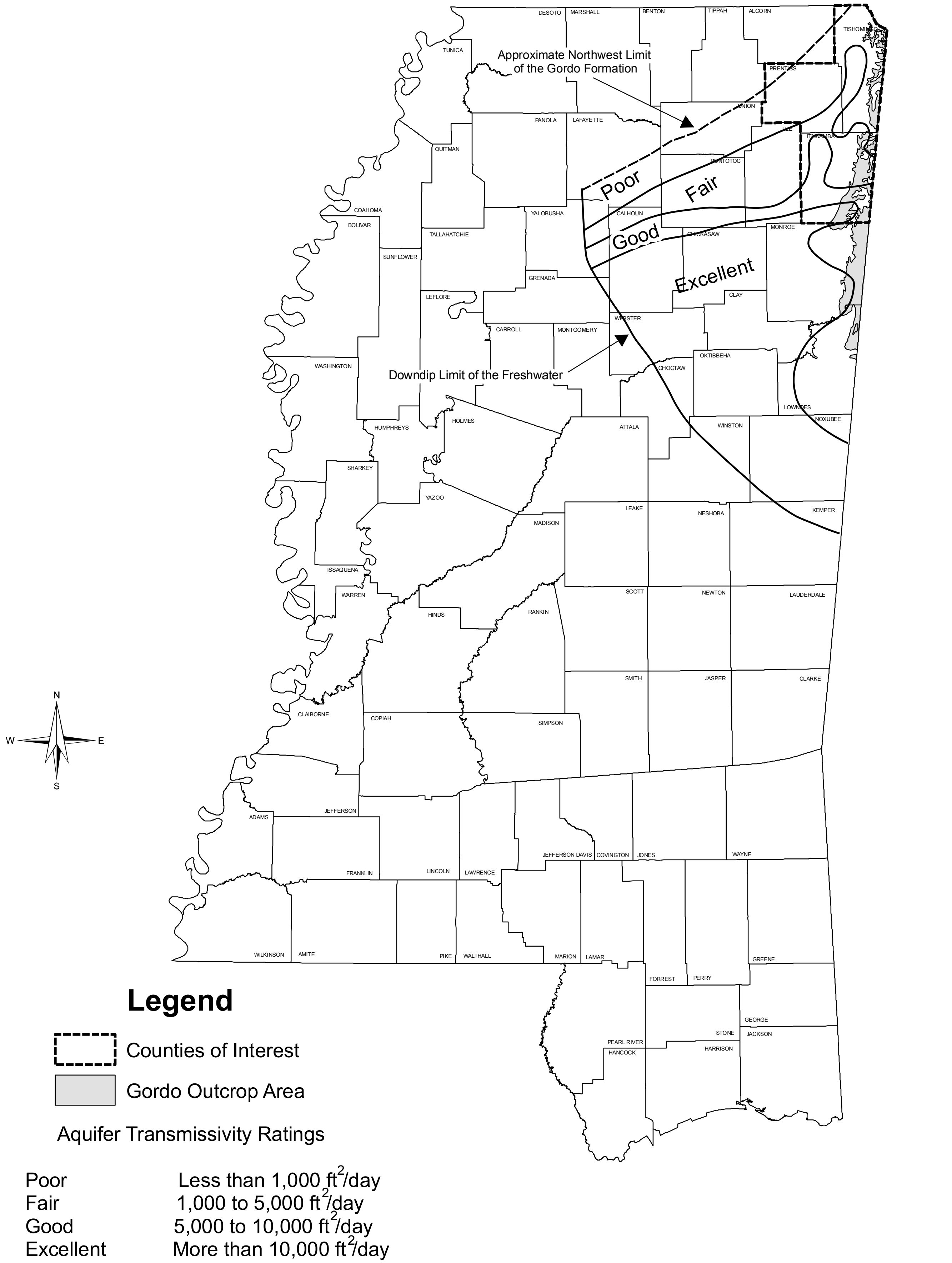


Figure 7: Transmissivity of the Gordo Aquifer (from Wasson, 1986)

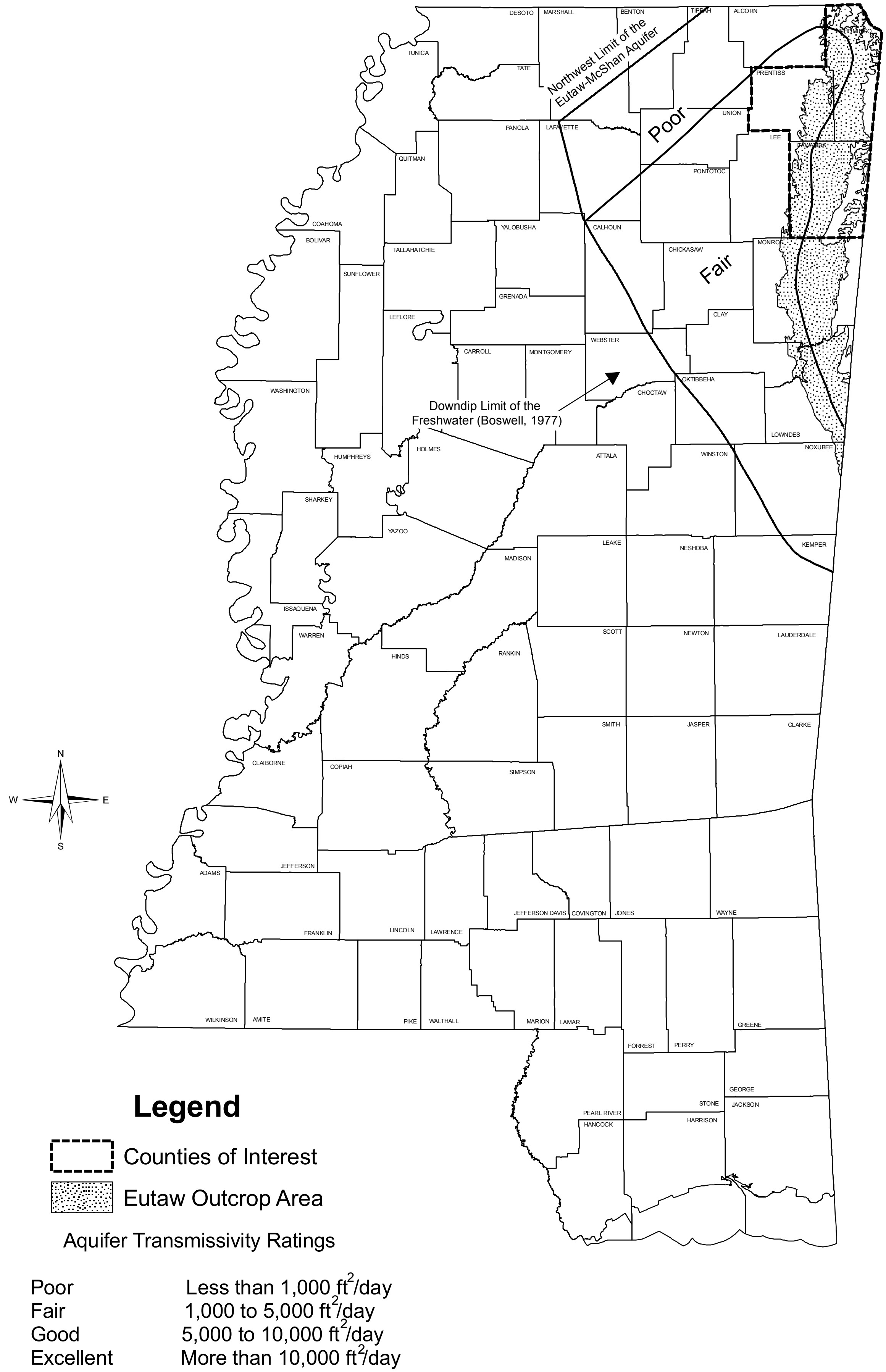
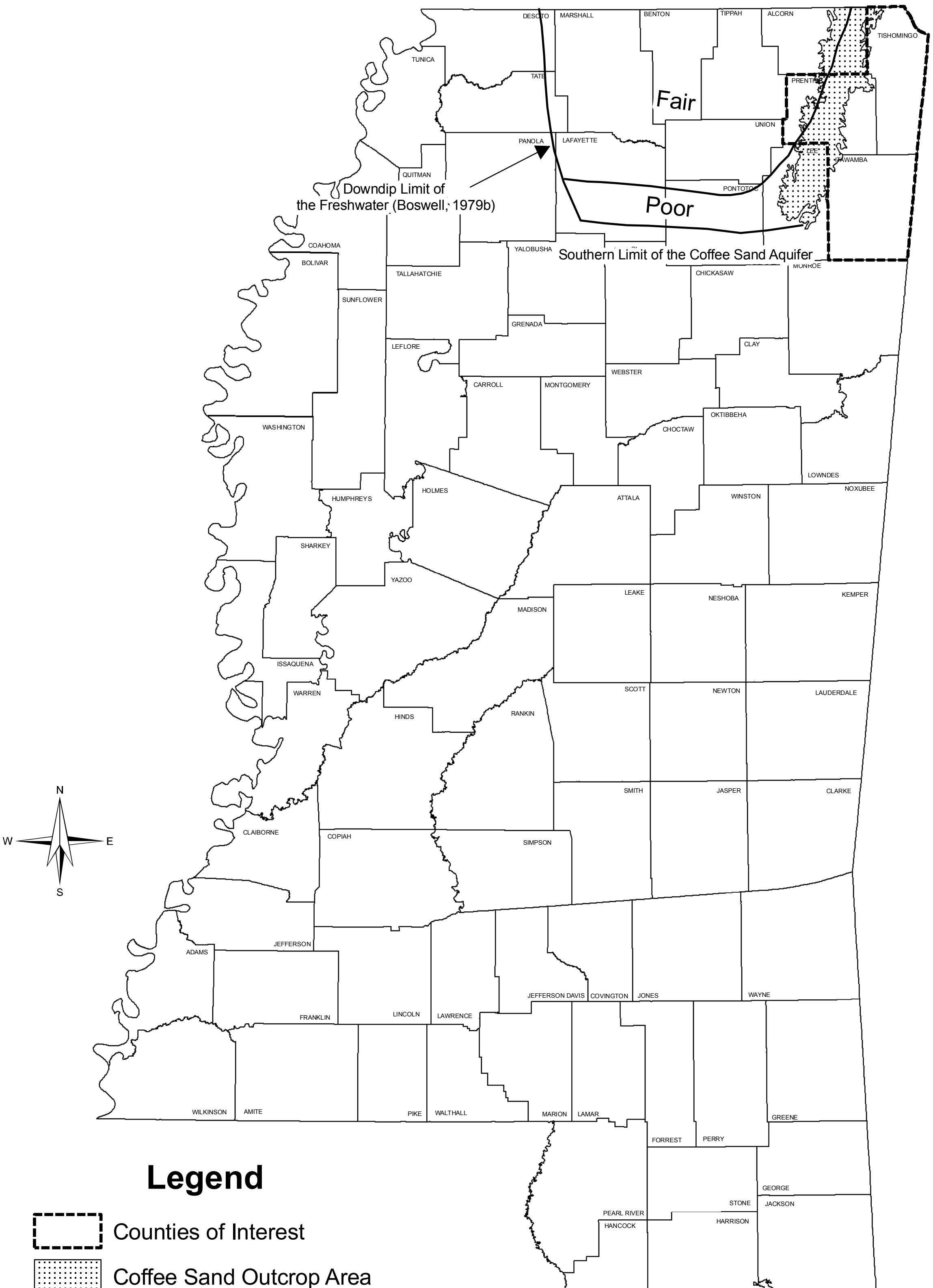


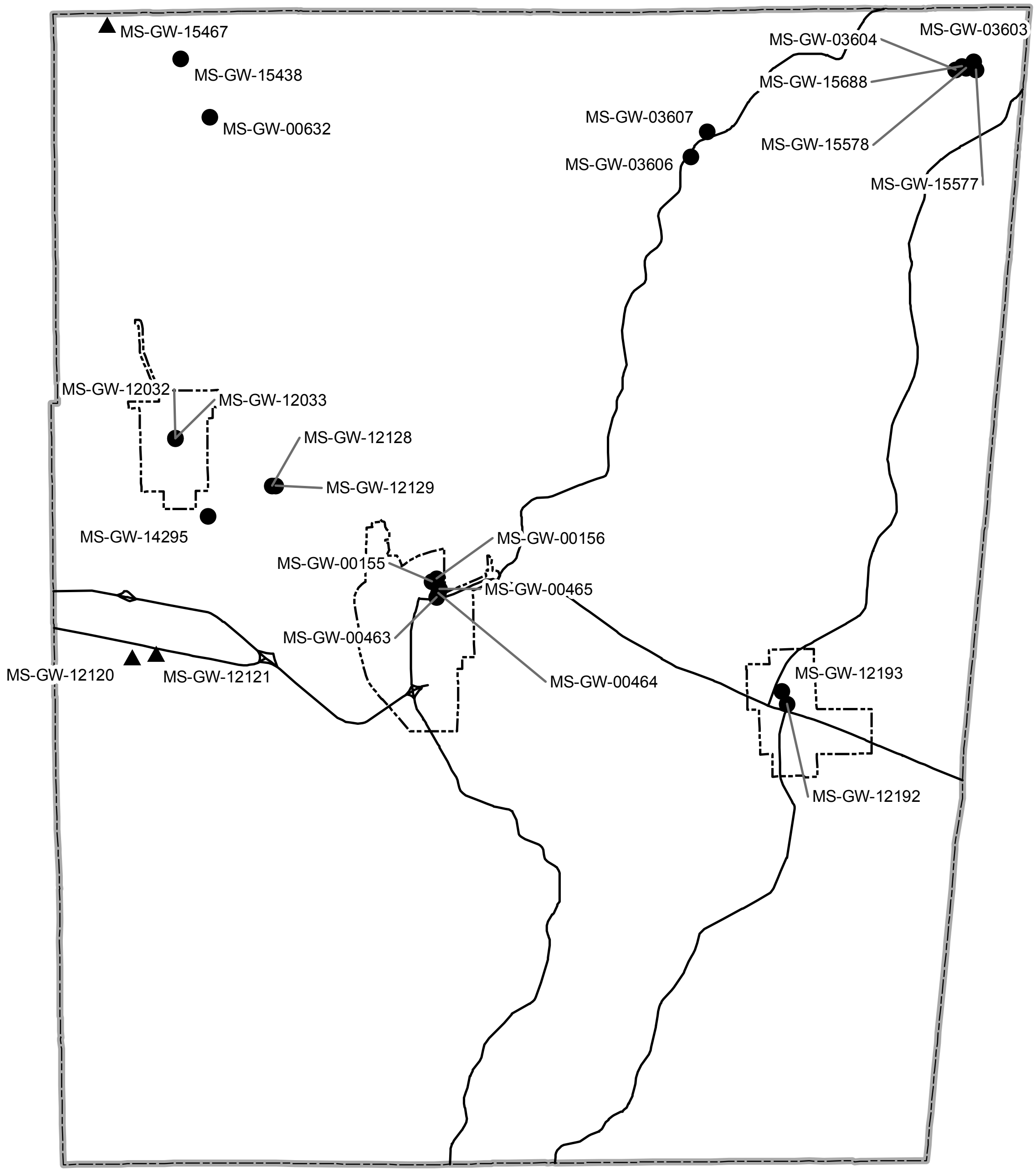
Figure 8: Transmissivity of the Eutaw-McShan Aquifer (from Wasson, 1986)



Aquifer Transmissivity Ratings

Poor	Less than 1,000 ft^2/day
Fair	1,000 to 5,000 ft^2/day
Good	5,000 to 10,000 ft^2/day
Excellent	More than 10,000 ft^2/day

Figure 9: Transmissivity of the Coffee Sand Aquifer (from Wasson, 1986)



Legend

Aquifer

▲ Eutaw-McShan Well

● Gordo Well

MS-GW-12121 OLWR Permit Number

Figure 10: Public Water Supply Wells in Itawamba County

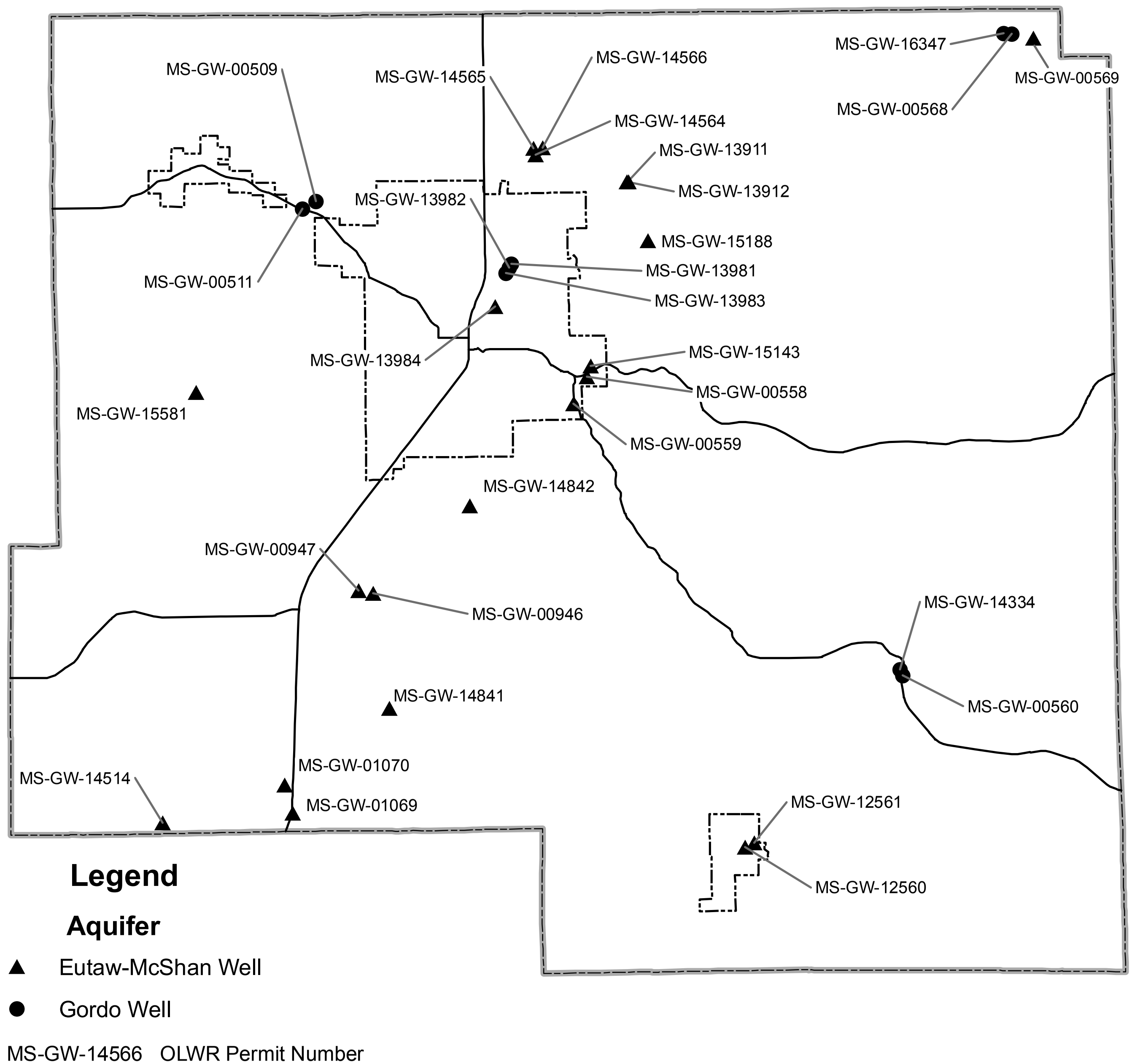


Figure 11: Public Water Supply Wells in Prentiss County

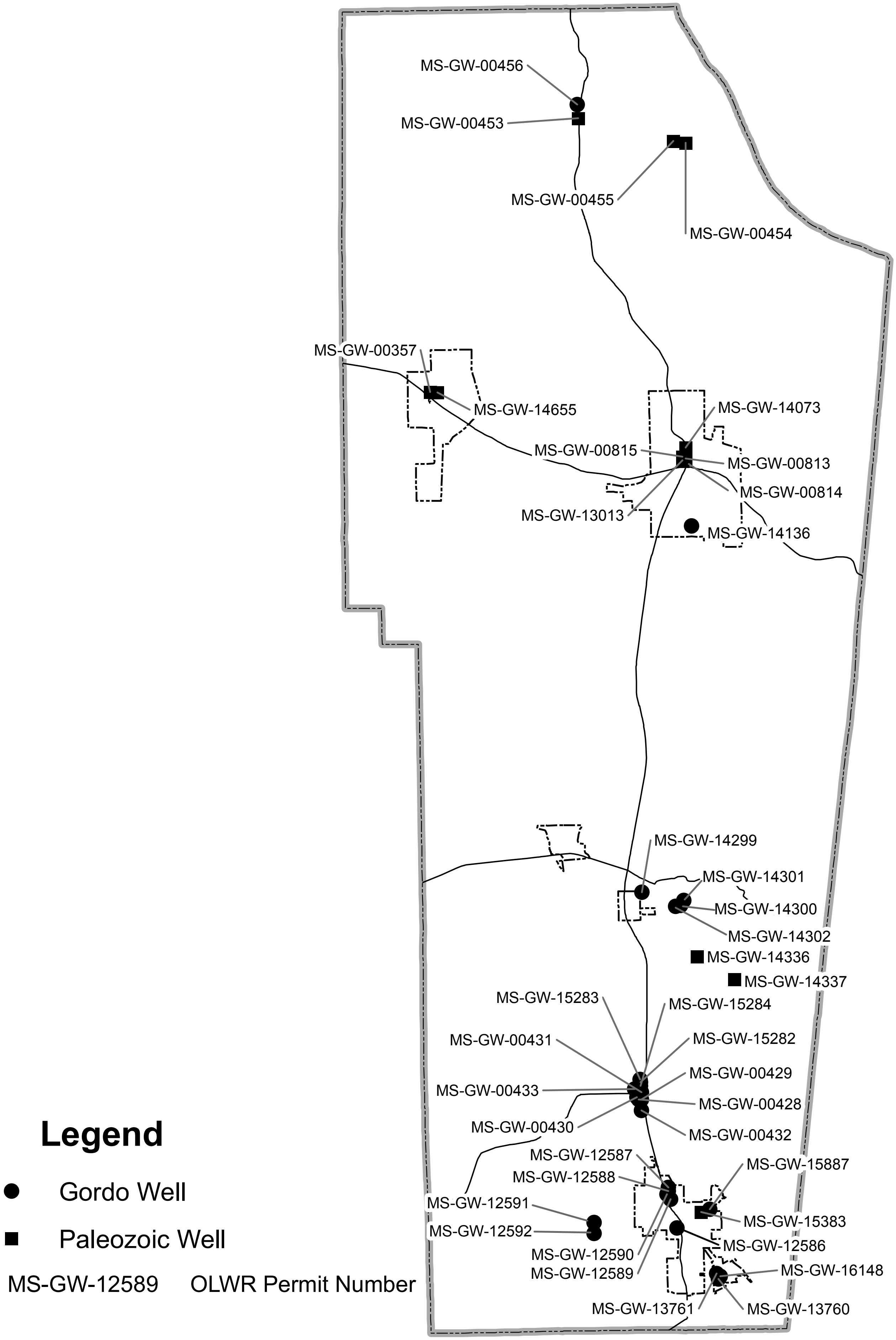


Figure 12: Public Supply Wells in Tishomingo County

Table 1

OLWR Permitted Wells in Itawamba, Prentiss, and Tishomingo Counties

Explanation of Tables:

"Date" means the expiration date of the term of the permit to withdraw water.

"Use" AB means "abandoned".
IN means "industrial".
NR means "not renewed" – assumed to be unused.
PS means "public supply".
SB means "standby".

"AFY" means rate water is permitted to be withdrawn in acre-feet per year.
"MGD" means rate water is permitted to be withdrawn in millions of gallons per day.

"Max R" means the maximum rate at which water is permitted to be pumped in gallons per minute.

"Depth" and "Elev" are well depth and land surface elevation in feet.

"Case" means maximum casing diameter in inches.

"Aquifer" means the aquifer in which the well is considered to be screened. Aquifer codes are:

"PLZC" - Paleozoic Rocks
"GORD" – Gordo
"ETMS" – Eutaw-McShan

Itawamba County Permitted Groundwater Withdrawals

Permit Number	Date	Use	Owner Name	Location	Withdrawn (MGD)	Withdrawn (AFY)	Maximum Rate	Well Depth	Casing Diameter	Quad	Elevation	Aquifer
MS-GW-12120	04/27/09	SB	DORSEY WATER ASSOCIATION	36 09S 07E	0	0	150	262	12	MOOREVILLE	383	ETMS
MS-GW-12121	04/27/09	SB	DORSEY WATER ASSOCIATION	36 09S 07E	0	0	150	305	10	MOOREVILLE	405	ETMS
MS-GW-00155	02/27/16	SB	FULTON, CITY OF	30 09S 09E	0	0	350	280	12	FULTON	370	GORD
MS-GW-00156	02/27/16	SB	FULTON, CITY OF	30 09S 09E	0	0	350	274	12	FULTON	365	GORD
MS-GW-00462	09/01/18	SB	FULTON, CITY OF	36 09S 08E	0	0	400	171	12	FULTON	296	GORD
MS-GW-00463	02/27/16	SB	FULTON, CITY OF	30 09S 09E	0	0	350	300	12	FULTON	404	GORD
MS-GW-00464	02/27/16	SB	FULTON, CITY OF	30 09S 09E	0	0	350	260	12	FULTON	370	GORD
MS-GW-00465	02/27/16	SB	FULTON, CITY OF	30 09S 09E	0	0	350	277	12	FULTON	410	GORD
MS-GW-00632	01/09/16	PS	HOUSTON-PALESTINE WATER ASSOCIATION	32 07S 08E	0.09	100.8287	225	353	8	KIRKVILLE	345	GORD
MS-GW-15438	08/03/19	PS	HOUSTON-PALESTINE WATER ASSOCIATION	30 07S 08E	0.1	112.0319	250	353	12	KIRKVILLE	372	GORD
MS-GW-15467	08/03/19	PS	HOUSTON-PALESTINE WATER ASSOCIATION	24 07S 07E	0.05	56.016	125	150	12	RATLIFF	341	ETMS
MS-GW-15367	11/10/08	NR	ITAWAMBA COUNTY, MISSISSIPPI	01 10S 08E	0	0	0	170	0	BEANS FERRY	255	GORD
MS-GW-12032	06/08/09	PS	MANTACHIE, TOWN OF	06 09S 08E	0.09	100.8287	150	343	8	FULTON	360	GORD
MS-GW-12033	06/08/09	PS	MANTACHIE, TOWN OF	06 09S 08E	0.09	100.8287	150	390	8	FULTON	360	GORD
MS-GW-14295	06/24/12	PS	MANTACHIE, TOWN OF	17 09S 08E	0.13	145.6415	224	383	10	FULTON	377	GORD
MS-GW-03603	10/01/17	PS	NORTHEAST ITAWAMBA WATER ASSOCIATION, INC	30 07S 11E	0.12	134.4383	118	163	10	RED BAY	610	GORD
MS-GW-03604	10/01/17	PS	NORTHEAST ITAWAMBA WATER ASSOCIATION, INC	30 07S 11E	0.09	100.8287	89	162	10	RED BAY	605	GORD
MS-GW-03605	10/01/17	SB	NORTHEAST ITAWAMBA WATER ASSOCIATION, INC	25 07S 10E	0	0	25	136	10	RED BAY	570	GORD
MS-GW-03606	10/01/17	PS	NORTHEAST ITAWAMBA WATER ASSOCIATION, INC	06 08S 10E	0.09	100.8287	91	239	10	FULTON NE	535	GORD
MS-GW-03607	10/01/17	PS	NORTHEAST ITAWAMBA WATER ASSOCIATION, INC	31 07S 10E	0.12	134.4383	116	210	10	FULTON NE	490	GORD
MS-GW-15577	08/22/10	PS	NORTHEAST ITAWAMBA WATER ASSOCIATION, INC	30 07S 11E	0.11	123.2351	100	143	10	RED BAY	613	GORD
MS-GW-15578	08/22/10	PS	NORTHEAST ITAWAMBA WATER ASSOCIATION, INC	30 07S 11E	0.11	123.2351	100	151	10	RED BAY	605	GORD
MS-GW-15688	04/24/11	PS	NORTHEAST ITAWAMBA WATER ASSOCIATION, INC	30 07S 11E	0.06	67.2192	60	152	10	RED BAY	600	GORD
MS-GW-16589	09/01/18	NR	TERRELL, GERALD	19 09S 11E	0	0	0	150	8	SHOTTSVILLE	410	GORD
MS-GW-12128	04/27/09	AB	TOMBIGBEE WATER ASSOCIATION	09 09S 08E	0	0	0	343	8	FULTON	380	GORD
MS-GW-12129	04/27/09	AB	TOMBIGBEE WATER ASSOCIATION	09 09S 08E	0	0	0	299	10	FULTON	361	GORD
MS-GW-12192	05/25/09	PS	TREMONT WATER ASSOCIATION	04 10S 10E	0.06	67.2192	150	168	10	TREMONT	420	GORD
MS-GW-12193	05/25/09	PS	TREMONT WATER ASSOCIATION	04 10S 10E	0.06	67.2192	150	150	10	TREMONT	410	GORD

Prentiss County Permitted Groundwater Withdrawals

Permit Number	Date	Use	Owner Name	Location			Withdrawn (MGD)	Withdrawn (AFY)	Maximum Rate	Well Depth	Casing Diameter	Quad Name	Elevation	Aquifer
MS-GW-01069	02/27/16	PS	BALDWYN, CITY OF	35	06S	06E	0.17	190.4543	183	420	10	BALDWYN	368	ETMS
MS-GW-01070	02/27/16	PS	BALDWYN, CITY OF	35	06S	06E	0.27	302.4862	289	380	10	BALDWYN	357	ETMS
MS-GW-14514	07/14/13	PS	BALDWYN, CITY OF	33	06S	06E	0.14	156.8447	300	566	12	BALDWYN	445	ETMS
MS-GW-00558	07/11/15	SB	BIG V WATER ASSOCIATION	13	05S	07E	0	0	200	503	8	BOONEVILLE	542	ETMS
MS-GW-00559	07/11/15	PS	BIG V WATER ASSOCIATION	23	05S	07E	0.16	179.2511	200	506	10	BOONEVILLE	550	ETMS
MS-GW-15143	06/09/18	PS	BIG V WATER ASSOCIATION	13	05S	07E	0.46	515.3468	590	470	12	BOONEVILLE	530	ETMS
MS-GW-15581	08/22/10	PS	BLACKLAND WATER ASSOCIATION	16	05S	06E	0.21	235.267	250	564	12	JUMPERTOWN	438	ETMS
MS-GW-13981	02/12/12	PS	BOONEVILLE, CITY OF WATER SYSTEM	03	05S	07E	0.93	1041.8969	1000	527	18	BOONEVILLE	505	GORD
MS-GW-13982	02/12/12	PS	BOONEVILLE, CITY OF WATER SYSTEM	03	05S	07E	0.57	638.5819	1000	513	18	BOONEVILLE	510	GORD
MS-GW-13983	02/12/12	PS	BOONEVILLE, CITY OF WATER SYSTEM	03	05S	07E	0.57	638.5819	1000	519	18	BOONEVILLE	518	GORD
MS-GW-13984	02/12/12	PS	BOONEVILLE, CITY OF WATER SYSTEM	10	05S	07E	0.1	112.0319	500	495	12	BOONEVILLE	495	ETMS
MS-GW-00244	08/12/07	SB	HEARTLAND BUILDING PRODUCTS, INC	03	05S	07E	0	0	450	471	12	BOONEVILLE	490	GORD
MS-GW-00568	05/23/15	PS	HOLCUT-CAIRO WATER ASSOCIATION	08	04S	09E	0.13	145.6415	250	450	12	PADEN	585	GORD
MS-GW-00569	05/23/15	SB	HOLCUT-CAIRO WATER ASSOCIATION	09	04S	09E	0	0	250	309	8	PADEN	585	ETMS
MS-GW-16347	12/11/16	PS	HOLCUT-CAIRO WATER ASSOCIATION	08	04S	09E	0.27	302.4862	500	575	18	PADEN	601	GORD
MS-GW-00509	05/09/15	PS	JUMPERTOWN, TOWN OF	25	04S	06E	0.13	145.6415	250	620	10	BOONEVILLE	508	GORD
MS-GW-00511	05/09/15	PS	JUMPERTOWN, TOWN OF	36	04S	06E	0.1	112.0319	203	637	10	JUMPERTOWN	520	GORD
MS-GW-12560	07/11/10	PS	MARIETTA, TOWN OF	04	07S	08E	0.05	56.016	133	196	12	MARIETTA	385	ETMS
MS-GW-12561	07/11/10	PS	MARIETTA, TOWN OF	04	07S	08E	0.04	44.8128	90	151	12	MARIETTA	340	ETMS
MS-GW-13911	02/24/13	SB	NEW CANDLER WATER ASSOCIATION	25	04S	07E	0	0	197	420	10	BOONEVILLE	530	ETMS
MS-GW-13912	02/24/13	PS	NEW CANDLER WATER ASSOCIATION	25	04S	07E	0.05	56.016	125	460	8	BOONEVILLE	538	ETMS
MS-GW-15188	10/10/17	PS	NEW CANDLER WATER ASSOCIATION	31	04S	08E	0.14	156.8447	200	442	12	BOONEVILLE	40	ETMS
MS-GW-00560	09/26/15	PS	NEW SITE WATER ASSOCIATION, INC	13	06S	08E	0.1	112.0319	250	275	10	MARIETTA	405	GORD
MS-GW-14334	08/12/12	PS	NEW SITE WATER ASSOCIATION, INC.	13	06S	08E	0.1	112.0319	250	262	10	MARIETTA	378	GORD
MS-GW-00682	11/13/16	SB	NORTH AMERICAN PIPE CORPORATION	03	05S	07E	0	0	500	477	10	BOONEVILLE	490	GORD
MS-GW-14564	04/14/13	PS	THRASHER WATER ASSOCIATION	23	04S	07E	0.08	89.6255	200	514	8	BOONEVILLE	523	GORD
MS-GW-14565	04/14/13	PS	THRASHER WATER ASSOCIATION	23	04S	07E	0.08	89.6255	200	495	10	BOONEVILLE	524	ETMS
MS-GW-14566	04/14/13	PS	THRASHER WATER ASSOCIATION	23	04S	07E	0.08	89.6255	200	483	10	BOONEVILLE	502	GORD
MS-GW-00946	06/12/16	PS	WHEELER-FRANKSTOWN WATER ASSOCIATION INC	07	06S	07E	0.12	134.4383	200	442	10	WHEELER	368	ETMS
MS-GW-00947	06/12/16	PS	WHEELER-FRANKSTOWN WATER ASSOCIATION INC	06	06S	07E	0.12	134.4383	200	405	10	WHEELER	360	ETMS
MS-GW-14841	11/08/14	PS	WHEELER-FRANKSTOWN WATER ASSOCIATION INC	19	06S	07E	0.12	134.4383	200	440	12	WHEELER	462	ETMS
MS-GW-14842	11/08/14	PS	WHEELER-FRANKSTOWN WATER ASSOCIATION INC	33	05S	07E	0.12	134.4383	200	415	12	WHEELER	503	ETMS
MS-GW-16648	04/06/19	PS	WHEELER-FRANKSTOWN WATER ASSOCIATION INC	33	05S	07E	0.12	134.4383	200	400	12	WHEELER	510	ETMS

Tishomingo County Permitted Groundwater Withdrawals

Permit Number	Date	Use	Owner Name	Location	Withdrawn (MGD)	Withdrawn (AFY)	Maximum Rate	Well Depth	Casing Diameter	Quad Name	Elevation	Aquifer
MS-GW-12586	07/23/01	NR	BELMONT, TOWN OF	02 07S 10E	0	0	0	200	10	BELMONT	580	GORD
MS-GW-12587	07/10/11	SB	BELMONT, TOWN OF	35 06S 10E	0	0	100	185	10	BELMONT	575	GORD
MS-GW-12588	07/10/11	SB	BELMONT, TOWN OF	35 06S 10E	0	0	100	120	10	BELMONT	575	GORD
MS-GW-12589	07/10/11	SB	BELMONT, TOWN OF	35 06S 10E	0	0	100	180	10	BELMONT	580	GORD
MS-GW-12590	07/10/11	SB	BELMONT, TOWN OF	35 06S 10E	0	0	100	185	10	BELMONT	580	GORD
MS-GW-12591	07/23/01	NR	BELMONT, TOWN OF	35 06S 10E	0	0	0	221	8	BELMONT	578	GORD
MS-GW-12592	07/23/01	AB	BELMONT, TOWN OF	01 07S 10E	0	0	0	150	10	BELMONT	575	GORD
MS-GW-15383	12/01/18	PS	BELMONT, TOWN OF	36 06S 10E	0.17	190.4543	400	180	14	BELMONT	535	PLZC
MS-GW-15887	08/12/12	PS	BELMONT, TOWN OF	36 06S 10E	0.29	324.8926	700	165	14	BELMONT	510	GORD
MS-GW-00357	04/24/16	PS	BURNSVILLE, TOWN OF	02 03S 09E	0.1	112.0319	350	285	10	BURNSVILLE	523	PLZC
MS-GW-14655	08/25/13	PS	BURNSVILLE, TOWN OF	02 03S 09E	0.1	112.0319	350	240	12	BURNSVILLE	479	PLZC
MS-GW-15282	06/02/18	PS	DENNIS WATER ASSOCIATION INC	15 06S 10E	0.04	44.8128	50	145	10	BELMONT	585	GORD
MS-GW-15283	06/02/18	PS	DENNIS WATER ASSOCIATION INC	15 06S 10E	0.07	78.4223	100	153	10	BELMONT	602	GORD
MS-GW-15284	06/02/18	PS	DENNIS WATER ASSOCIATION INC	15 06S 10E	0.11	123.2351	150	162	10	BELMONT	602	GORD
MS-GW-00428	06/27/15	PS	DENNIS WATER ASSOCIATION, INC	15 06S 10E	0.056	56.016	76	172	10	BELMONT	622	GORD
MS-GW-00429	06/27/15	PS	DENNIS WATER ASSOCIATION, INC	15 06S 10E	0.052	56.016	71	140	10	BELMONT	580	GORD
MS-GW-00430	06/27/15	PS	DENNIS WATER ASSOCIATION, INC	15 06S 10E	0.062	56.016	84	169	10	BELMONT	620	GORD
MS-GW-00431	06/27/15	PS	DENNIS WATER ASSOCIATION, INC	15 06S 10E	0.064	56.016	87	161	10	BELMONT	579	GORD
MS-GW-00432	06/27/15	PS	DENNIS WATER ASSOCIATION, INC	15 06S 10E	0.052	56.016	71	145	10	BELMONT	610	GORD
MS-GW-00433	06/27/15	PS	DENNIS WATER ASSOCIATION, INC	15 06S 10E	0.052	56.016	71	150	12	BELMONT	602	GORD
MS-GW-13760	05/22/11	PS	GOLDEN WATER DEPARTMENT, TOWN OF	12 07S 10E	0.11	123.2351	150	120	16	RED BAY	562	GORD
MS-GW-13761	05/22/11	PS	GOLDEN WATER DEPARTMENT, TOWN OF	12 07S 10E	0.11	123.2351	150	110	16	RED BAY	558	GORD
MS-GW-16148	11/08/14	PS	GOLDEN WATER DEPARTMENT, TOWN OF	12 07S 10E	0.07	78.4223	100	115	8	RED BAY	558	GORD
MS-GW-15296	09/29/18	IN	HANKINS FOREST PRODUCTS INC	23 06S 10E	0.05	56.016	75	135	6	BELMONT	590	GORD
MS-GW-00813	04/24/16	PS	IUKA, CITY OF	13 03S 10E	0.32	358.5021	600	360	12	IUKA	578	PLZC
MS-GW-00814	04/24/16	SB	IUKA, CITY OF	13 03S 10E	0	0	400	378	6	IUKA	579	PLZC
MS-GW-00815	04/24/16	PS	IUKA, CITY OF	13 03S 10E	0.32	358.5021	600	405	12	IUKA	598	PLZC
MS-GW-13013	04/24/16	PS	IUKA, CITY OF	13 03S 10E	0.4	448.1277	750	377	16	IUKA	581	PLZC
MS-GW-14073	04/24/16	PS	IUKA, CITY OF	13 03S 10E	0.4	448.1277	750	386	16	IUKA	610	PLZC
MS-GW-14336	01/02/12	SB	MDWFP	25 05S 10E	0	0	20	100	6	BELMONT	500	PLZC
MS-GW-14337	01/02/12	SB	MDWFP	31 05S 11E	0	0	60	150	6	BELMONT	461	PLZC
MS-GW-14136	04/28/02	NR	MIDWAY-PLEASANT HILL WATER ASSOC.	25 03S 10E	0	0	0	400	16	IUKA	680	GORD
MS-GW-00453	08/08/15	PS	SHORT COLEMAN PARK WATER ASSOCIATION	33 01S 10E	0.066	73.9411	100	100	10	YELLOW CREEK	460	PLZC
MS-GW-00454	08/08/15	PS	SHORT COLEMAN PARK WATER ASSOCIATION	01 02S 10E	0.04	44.8128	60	290	8	YELLOW CREEK	626	PLZC
MS-GW-00455	08/08/15	PS	SHORT COLEMAN PARK WATER ASSOCIATION	01 02S 10E	0.122	136.6789	185	321	6	YELLOW CREEK	530	PLZC
MS-GW-00456	08/08/15	PS	SHORT COLEMAN PARK WATER ASSOCIATION	33 01S 10E	0.33	369.7053	500	226	16	YELLOW CREEK	437	GORD
MS-GW-14299	09/23/12	PS	TISHOMINGO, TOWN OF	14 05S 10E	0.15	168.0479	200	0	0	TISHOMINGO	500	GORD
MS-GW-14300	09/23/12	SB	TISHOMINGO, TOWN OF	24 05S 10E	0	0	60	91	10	TISHOMINGO	600	GORD
MS-GW-14301	09/23/12	SB	TISHOMINGO, TOWN OF	24 05S 10E	0	0	55	89	10	TISHOMINGO	605	GORD
MS-GW-14302	09/23/12	SB	TISHOMINGO, TOWN OF	24 05S 10E	0	0	102	120	10	TISHOMINGO	625	GORD

Table 2

Water Level Data for Itawamba, Prentiss, and Tishomingo Counties

"USGS #/ FIP Code" is a unique identification number for each well that incorporates a USGS well number with a code identifying the county in which the well is located.

"Health #" is the State Board of Health identification number for each public water supply well.

"Aquifer" is the aquifer in which each well is considered to be screened.

Aquifer codes are: "PLZC" means Paleozoic rocks.
"GORD" means Gordo.
"ETMS" means Eutaw-McShan.
"COFF" means Coffee Sand.

"LS Elev." means land surface elevation of the well in feet relative to mean sea level.

"Depth of Screen (LS)" means depth to reported top and bottom openings of the well screen in feet below land surface.

"Elevation of Screen (MSL)" means the elevation of the reported top and bottom openings of the well screen relative to mean sea level. A negative sign means the elevation is below sea level.

"Level (LS)" means the depth of the non-pumping water level measured on the date listed in the preceding column in feet relative to land surface. A negative number means the water level was below land surface and a positive number means that the water level was above land surface.

Water Level Data By County And Owner

ITAWAMBA

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
DORSEY W.A.	G0064-057	290002-02	ETMS	383	NE SE S36 T9S R7E	203 to 262	180 to 121	11/01/1975	-88.00
DORSEY WA	G0035-057	290002-01	ETMS	405	NE SW NE SW S36 T9S R7E	245 to 305	160 to 100	09/18/2008	-126.15
								09/22/2004	-124.27
								01/05/1999	-124.30
								11/03/1992	-136.41
								05/23/1989	-132.60
								10/11/1978	-134.00
								11/01/1966	-125.00
FULTON, CITY OF	H0012-057	290003-01	GORD	404	SW NE S30 T9S R9E	250 to 300	154 to 104	07/01/1977	-132.00
FULTON, CITY OF	H0014-057	290003-03	GORD	410	SW NE S30 T9S R9E	227 to 277	183 to 133	09/17/1981	-164.00
								07/01/1977	-132.00
FULTON, CITY OF	H0021-057	290003-04	GORD	365	NW NE S30 T9S R9E	180 to 270	185 to 95	04/01/1986	-106.00
FULTON, TOWN OF	G0053-057		GORD	296	SE NE SW SE S36 T9S R8W	115 to 171	181 to 125	09/16/2008	-13.99
								07/07/2004	-10.15
								01/11/1999	-20.17
								11/04/1992	-22.38
								05/15/1989	-18.88
								09/17/1981	-53.00
								01/01/1974	-26.00
								01/01/1970	-10.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
FULTON, TOWN OF	H0020-057	290003-05	GORD	370	SW NW NW NE S30 T9S R9E	228 to 280	142 to 90	09/16/2008	-86.90
								07/07/2004	-84.92
								01/12/1999	-116.49
								04/01/1986	-106.00
GRAHAM LUMBER CO.	H0008-057		ETMS	480	NW SW SW NE S11 T9S R9E	47 to 117	433 to 363	09/16/2008	-60.90
								12/13/2006	-58.33
								06/16/2004	-56.10
								01/12/1999	-54.32
								11/05/1992	-54.19
								05/23/1989	-54.60
								08/19/1987	-55.40
								11/16/1982	-55.80
								10/12/1978	-54.00
								02/01/1974	-50.00
HOUSTON WA	A0018-057	290004-01	GORD	345	SW NE NE SW S32 T7S R8E	292 to 353	53 to -8	09/18/2008	-52.05
								07/08/2004	-50.90
								01/05/1999	-53.30
								12/15/1992	-52.34
								05/01/1989	-53.30
								01/01/1987	-55.90
								10/09/1985	-57.00
								01/01/1982	-63.90
								10/11/1978	-51.00
								04/01/1973	-45.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
HOUSTON-PALESTINE WA	A0026-057	290004-02	ETMS	341	SW NW S24 T7S R7E	130 to 148	211 to 193	09/18/2008	-58.06
								07/08/2004	-54.95
								04/05/2000	-62.85
								07/14/1988	-48.00
MANTACHIE WA	G0061-057	290005-02	GORD	364	SE SE S6 T9S R8E	325 to 355	39 to 9	06/01/1973	-93.00
MANTACHIE WA	G0085-057	290005-03	GORD	377	NW NE NW NW S17 T9S R8E	332 to 383	45 to -6	01/05/1999	-99.36
								04/06/1992	-100.00
MANTACHIE WA.	G0030-057	290005-01	GORD	360	NW SE SE S6 T9S R8E	313 to 343	47 to 17	09/16/2008	-86.80
								07/08/2004	-87.55
								01/05/1999	-96.37
								11/04/1992	-95.04
								05/23/1989	-93.70
								11/17/1982	-123.25
								10/11/1978	-93.00
								12/01/1972	-88.00
								01/01/1965	-85.00
NE ITAWAMBA WA	C0009-057	290016-01	GORD	580	NW SW NW NE S30 T7S R11E	141 to 163	439 to 417	04/05/2000	-133.40
								02/12/1979	-114.00
NE ITAWAMBA WA	C0010-057		GORD	570	NE NW NE NE S36 T7S R10E	116 to 136	454 to 434	09/17/2008	-103.20
								05/17/2004	-101.80
								10/16/2000	-102.70
								07/05/2000	-101.80
								01/12/1999	-99.29
								11/05/1992	-99.04
								05/23/1989	-112.40
								12/10/1987	-110.45

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
NE ITAWAMBA WA	C0011-057	290016-02	GORD	600	NW SW SW NW S30 T7S R11E	141 to 162	459 to 438	10/16/2000	-143.50
								07/05/2000	-145.19
								04/05/2000	-140.10
								10/11/1978	-112.00
NE ITAWAMBA WA	C0012-057	290017-02	GORD	490	NW SE S31 T7S R10E	154 to 175	336 to 315	02/12/1979	-95.00
NE ITAWAMBA WA	C0014-057	290016-03	GORD	600	SW NW S30 T7S R11E	132 to 152	468 to 448		
NE ITAWAMBA WA	C0016-057	290016-04	GORD	613	SW NE S30 T7S R11E	123 to 143	490 to 470		
NE ITAWAMBA WA	C0017-057	290016-05	GORD	605	SE NW S30 T7S R11E	131 to 151	474 to 454		
NE ITAWAMBA WA	F0004-057	290017-01	GORD	535	NE NW SW NW S6 T8S R10E	219 to 239	316 to 296	09/17/2008	-152.70
								01/12/1999	-150.83
								11/05/1992	-146.94
								05/31/1989	-152.60
								08/20/1987	-148.32
								01/17/1982	-156.93
								10/12/1978	-151.00
TREMONT WA	M0005-057	290010-01	GORD	420	SE NW SE SW S4 T10S R10E	125 to 155	295 to 265	09/18/2008	-86.60
								06/24/2004	-85.06
								04/05/2000	-85.70
								01/12/1999	-84.30
								11/05/1992	-85.09
								05/23/1989	-84.90
								08/19/1987	-85.42
								11/16/1982	-85.24
								10/12/1978	-84.50
								01/01/1973	-84.00
								06/01/1971	-85.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
TREMONT WA	M0007-057	290010-02	GORD	402	SW NW NE SW S4 T10S R10E	118 to 140	284 to 262	04/05/2000	-73.75
								12/28/1979	-76.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	E0005-057		GORD	310	NE SE NE SE S18 T8S R9E	110 to 130	200 to 180	09/17/2008	3.65
								02/07/2007	4.71
								02/09/2006	5.30
								06/16/2004	4.88
								10/01/2003	4.43
								09/04/2002	3.27
								06/27/2001	3.10
								09/19/2000	1.60
								04/13/1999	3.96
								01/12/1999	3.11
								03/20/1998	4.17
								09/24/1997	3.27
								04/09/1997	3.75
								11/19/1996	2.91
								06/26/1996	3.14
								11/08/1995	2.51
								05/17/1995	3.77
								01/01/1992	0.31
								05/23/1989	2.40
								01/01/1987	1.19
								12/11/1986	1.56
								01/29/1985	-0.44
								05/16/1984	-36.49
								05/31/1983	-34.73
								05/20/1982	-43.73
								05/14/1981	-13.94
								05/27/1980	-4.48

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
								05/17/1979	-0.22
								06/08/1978	0.45
								05/18/1977	2.39
								03/10/1976	3.50
								06/26/1975	3.02
								04/10/1974	2.36
								04/26/1973	3.52
								10/01/1972	1.77

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)			Elevation of Screen (MSL)			Year	Level (LS)
USACE	K0039-057		GORD	266	NE NE NW S24 T10S R8E	150	to	170	116	to	96	07/08/2008	-8.12
												12/13/2006	-7.47
												06/22/2004	-6.82
												01/05/1999	-8.96
												12/15/1992	-9.91
												08/07/1989	-8.61
												08/10/1988	-11.20
												08/18/1987	-10.35
												01/30/1985	-9.62
												08/29/1984	-14.04
												08/09/1983	-12.70
												11/17/1982	-15.88
												08/11/1981	-16.54
												08/27/1980	-16.40
												08/09/1979	-10.09
												08/31/1978	-8.45
												08/02/1977	-8.31
												08/26/1976	-7.48
												09/23/1975	-5.47
												10/16/1974	-7.16
												07/12/1973	-6.45
												10/16/1972	-8.24

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)

PRENTISS

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
BALDWYN, TOWN OF	J0068-117	590001-02	ETMS	368	NE SW NE SE S35 T6S R6E	350 to 420	18 to -52	08/24/1998	-87.40
								10/20/1992	-89.50
								08/18/1987	-87.30
								10/17/1978	-60.00
								08/01/1967	-41.00
BALDWYN, TOWN OF	J0090-117	590001-03	ETMS	357	SE SE S26 T6S R6E	310 to 380	47 to -23	10/20/1992	-82.70
								08/18/1987	-72.90
								11/29/1982	-66.78
								10/17/1978	-55.10
								09/30/1974	-40.00
BALDWYN, TOWN OF	J0093-117	590008-01	ETMS	445	NE SW SW S33 T6S R6E	506 to 566	-61 to -121	06/15/2004	-166.75
								08/24/1998	-164.45
								06/01/1994	-165.00
BIG V WA	F0044-117	590002-01	ETMS	540	NW SW S13 T5S R7E	423 to 503	117 to 37	01/01/1967	-201.00
BIG V WA	F0059-117	590002-02	ETMS	545	NW SW NE NE S23 T5S R7E	459 to 500	86 to 45	08/25/1998	-241.65
								10/21/1992	-238.80
								05/11/1988	-236.46
								01/23/1981	-227.00
BIG V WA	F0066-117	590002-03	ETMS	530	NW SW SW NW S13 T5S R7E	420 to 470	110 to 60	09/25/2008	-227.50
								07/22/2004	-224.83
								08/25/1998	-226.90
								07/31/1996	-224.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
BLACKLAND WA	E0061-117	590003-01	ETMS	438	NE SE SE S16 T5S R63	504 to 564	-66 to -126	09/25/2008	-141.60
								06/15/2004	-139.15
								08/28/2001	-138.00
BOONEVILLE, CITY OF	F0058-117	590004-03	GORD	505	NW NE S3 T5S R7E	527 to 587	-22 to -82	06/23/1978	-184.00
BOONEVILLE, CITY OF	F0062-117	590004-04	GORD	510	SW SW NW NE S3 T5S R7E	453 to 513	57 to -3	09/26/2008	-202.60
								08/26/1998	-202.85
								10/21/1992	-216.75
								05/11/1988	-204.08
								09/28/1984	-198.00
HEARTLAND BUILDING PRODUCTS	F0064-117		GORD	510	NW NW SE S3 T5S R7E	420 to 471	90 to 39	09/26/2008	-183.80
								04/19/2000	-184.44
								04/15/1999	-182.82
								03/19/1998	-182.34
								09/24/1997	-182.67
								04/24/1997	-182.39
								03/12/1997	-182.51
								10/21/1992	-184.30
								03/02/1987	-179.00
HOLCUT CAIRO WA	D0018-117	590007-01	ETMS	585	NE SW S4 T4S R9E	255 to 305	330 to 280	09/24/2008	-169.80
								08/19/1987	-200.40
								11/30/1982	-174.50
								10/18/1978	-166.00
								09/01/1969	-146.00

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
HOLCUT CAIRO WA	D0038-117	590007-02	GORD	585	SW NE NE SW S8 T4S R9E	400 to 450	185 to 135	09/22/2004	-228.20
								03/03/1999	-234.90
								11/05/1992	-226.50
								05/11/1988	-202.39
								11/30/1982	-188.00
								12/22/1981	-182.00
HOLCUT CAIRO WA	D0045-117	590007-03	GORD	601	NE SW S9 T4S R9E	495 to 575	106 to 26	09/24/2008	-235.60
								09/10/2007	-235.00
HOWELL, ROBERT	J0010-117		COFF	424	SE SW SW S31 T6S R6E	42 to 300	382 to 124	07/09/2008	-103.70
								02/08/2006	-102.30
								06/14/2004	-102.56
								08/26/1998	-101.10
								02/24/1993	-100.80
								07/20/1973	-120.00
								01/01/1956	-90.00
JUMPERTOWN WA	A0063-117	590009-01	GORD	508	SW SW SE S25 T4S R6E	560 to 620	-52 to -112	09/25/2008	-206.70
								10/17/1978	-172.00
								12/01/1975	-160.00
JUMPERTOWN WA	A0064-117	590009-02	GORD	518	NE NE NW NW S36 T4S R6E	597 to 637	-79 to -119	09/25/2008	-223.00
								06/15/2004	-208.32
								08/25/1998	-210.90
								10/21/1992	-210.20
								01/01/1987	-214.60
								09/10/1980	-210.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
MARIETTA WA	L0091-117	590010-01	ETMS	340	SW NE SE NW S4 T7S R8E	120 to 150	220 to 190	09/25/2008	-40.67
								09/22/2004	-39.50
								04/04/2000	-40.80
								08/25/1998	-41.40
								11/17/1992	-37.90
								09/10/1986	-39.00
MARIETTA WA	L0094-117	590010-02	ETMS	385	S4 T7S R8E	155 to 196	230 to 189	11/17/1992	-77.90
								08/02/1988	-78.00
NEW CANDLER WA	B0035-117	590011-01	ETMS	515	NE SE S25 T4S R7E	373 to 460	142 to 55	12/02/1982	-198.90
								10/18/1978	-210.00
								02/01/1968	-208.00
NEW CANDLER WA	B0057-117	590011-02	ETMS	535	NE NE NE SE S25 T4S R7E	360 to 420	175 to 115	09/25/2008	-211.60
								08/25/1998	-210.60
								10/28/1992	-215.60
								12/01/1987	-208.60
								12/01/1976	-195.00
NEW CANDLER WA	C0028-117	590011-03	ETMS	540	SE SW S31 T4S R8E	337 to 442	203 to 98	09/25/2008	-241.45
								02/06/1998	-231.00
NEW SITE WA	L0092-117		GORD	370	NE SE SW S13 T6S R8E	222 to 262	148 to 108	11/17/1992	-65.60
								10/27/1986	-66.00
NEW SITE WA.	L0090-117	590018-01	GORD	405	SW NW SW SE S13 T6S R8E	239 to 279	166 to 126	09/25/2008	-93.60
								08/25/1998	-92.10
								12/17/1992	-91.78
								08/19/1987	-87.60
								09/01/1978	-88.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
S. PRENTISS MISSIONARY BAPTIST	K0089-117		ETMS	355	NE SW NE NW S1 T7S R7E	210 to 220	145 to 135	07/09/2008	-49.70
								11/02/2006	-49.33
								04/21/2004	-47.88
								08/24/1998	-48.30
								04/16/1991	-51.00
THRASHER WA	B0034-117	590013-01	ETMS	523	SW SW SW S23 T4S R7E	to	to	01/01/1987	-183.60
								08/02/1973	-192.10
								12/01/1966	-176.00
THRASHER WA	B0058-117	590013-02	ETMS	524	NE NW SW SW S23 T4S R7E	435 to 495	89 to 29	09/25/2008	-218.40
								08/25/1998	-211.55
								07/01/1988	-214.00
THRASHER WA	B0059-117	590013-03	ETMS	502	NE NE SW SW S23 T4S R7E	430 to 480	72 to 22	10/28/1992	-186.10
								01/02/1990	-190.00
USACE	D0027-117		ETMS	510	SE SE NW NE S33 T4S R9E	240 to 242	270 to 268	04/21/2004	-90.15
								08/25/1998	-90.62
								02/25/1993	-90.65
								08/23/1985	-90.10
								05/29/1985	-89.49
								02/22/1985	-89.84
								11/30/1982	-91.10
								09/06/1977	-84.00

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	D0028-117		ETMS	518	NW NE S33 T4S R9E	156 to 158	362 to 360	07/09/2008	-73.29
								02/08/2006	-72.56
								04/21/2004	-72.61
								08/27/2003	-73.10
								09/05/2002	-74.12
								06/27/2001	-73.97
								09/18/2000	-75.39
								04/19/2000	-74.27
								04/13/1999	-73.24
								08/25/1998	-74.00
								03/19/1998	-73.10
								09/24/1997	-73.28
								04/24/1997	-73.32
								03/13/1997	-73.60
								02/25/1993	-76.38
								05/03/1988	-73.80
								08/11/1987	-74.38
								12/09/1986	-73.96
								08/23/1985	-73.90
								05/29/1985	-73.43
								02/22/1985	-80.76
								11/30/1982	-77.37
								09/06/1977	-30.00

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	D0029-117		ETMS	510	NW NE S33 T4S R9E	61 to 63	449 to 447	08/25/1998	-45.35
								02/25/1993	-44.83
								08/23/1985	-42.47
								05/29/1985	-49.40
								02/22/1985	-45.68
								11/30/1982	-47.31
								09/06/1977	-48.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	D0030-117		GORD	518	SE SE NW NE S33 T4S R9E	280 to 285	238 to 233	07/09/2008	-98.26
								02/08/2006	-97.11
								04/21/2004	-97.02
								08/27/2003	-97.23
								09/05/2002	-98.02
								06/27/2001	-98.21
								09/18/2000	-98.70
								04/19/2000	-97.97
								04/13/1999	-96.70
								08/25/1998	-96.50
								03/19/1998	-96.34
								09/24/1997	-96.47
								04/24/1997	-93.13
								03/13/1997	-96.48
								02/25/1993	-96.65
								01/01/1987	-95.97
								12/09/1986	-95.50
								11/19/1985	-93.93
								08/23/1985	-94.32
								05/29/1985	-93.90
								02/22/1985	-94.26
								10/18/1978	-82.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	M0021-117		GORD	472	SW SE SE NW S28 T6S T9E	206 to 226	266 to 246	07/09/2008	-156.79
								02/08/2006	-154.52
								04/21/2004	-156.22
								08/27/2003	-156.15
								09/05/2002	-157.19
								02/22/2001	-158.75
								09/18/2000	-158.88
								04/19/2000	-157.33
								04/13/1999	-156.09
								08/24/1998	-155.85
								03/26/1998	-155.39
								09/24/1997	-155.89
								04/24/1997	-155.43
								03/13/1997	-155.62
								12/17/1992	-156.99
								05/05/1988	-156.76
								08/13/1987	-156.10
								12/11/1986	-155.13
								01/30/1985	-151.96
								05/16/1984	-150.98
								06/01/1983	-150.09
								11/17/1982	-150.75
								05/20/1981	-146.76
								05/27/1980	-144.40
								05/17/1979	-143.45
								06/09/1978	-142.00
								05/18/1977	-141.06

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
								03/09/1976	-139.36
								06/26/1975	-139.10
								04/10/1974	-137.26
								04/25/1973	-136.16
								05/23/1972	-136.05

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	M0022-117		ETMS	471	SW SE SE NW S28 T6S R9E	166 to 176	305 to 295	07/09/2008	-76.47
								02/08/2006	-72.72
								04/21/2004	-71.65
								08/27/2003	-68.47
								09/05/2002	-69.82
								02/22/2001	-73.13
								09/18/2000	-72.56
								08/24/1998	-69.00
								12/16/1992	-74.54
								05/05/1988	-76.60
								08/13/1987	-75.46
								02/26/1987	-75.70
								12/11/1986	-76.56
								01/30/1985	-74.19
								05/16/1984	-73.50
								06/01/1983	-74.52
								11/17/1982	-77.60
								05/20/1982	-76.76
								05/20/1981	-74.99
								05/27/1980	-71.57
								05/17/1979	-73.10
								06/09/1978	-73.70
								05/18/1977	-73.27
								06/09/1976	-71.95
								06/26/1975	-71.76
								04/10/1974	-72.72
								04/25/1973	-74.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
								05/23/1972	-76.31
WADDLE, O. L.	F0030-117		COFF	501	SE NE NE SW S2 T5S R7E	50 to 149	451 to 352	07/09/2008	-61.66
								11/02/2006	-61.70
								07/22/2004	-61.87
								08/26/1998	-61.70
								02/25/1993	-61.50
								10/17/1978	-62.00
								01/01/1956	-75.00
WHEELER FRANKSTOWN	F0065-117	590014-04	ETMS	500	SW NE S33 T5S R7E	375 to 415	125 to 85	09/26/2008	-210.70
								07/22/2004	-211.93
								02/01/1996	-204.00
WHEELER-FRANKSTON WA	K0090-117	590014-03	ETMS	460	SE SW SE NE S19 T6S R7E	399 to 440	61 to 20	09/26/2008	-173.70
								06/14/2004	-179.00
								08/25/1998	-175.65
								02/02/1995	-166.00
WHEELER-FRANKSTOWN WA	K0086-117	590014-02	ETMS	360	SE SE SW SW S6 T6S R7E	333 to 405	27 to -45	09/26/2008	-69.10
								06/14/2004	-66.37
								08/25/1998	-67.20
								10/21/1992	-74.10
								08/19/1987	-69.90
								02/26/1975	-50.00

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
TISHOMINGO									
BELMONT, TOWN OF	L0018-141	710001-02	GORD	580	NW SW NE NE S2 T7S R10E	110 to 200	470 to 380	09/17/2008	-92.80
								04/22/2004	-89.54
								04/15/1969	-45.00
BELMONT, TOWN OF	L0067-141	710001-07	PLZC	535	SE SE NE SW S36 T6S R10E	150 to 180	385 to 355	09/17/2008	-60.02
								09/18/2003	-58.10
								04/05/2000	-59.70
								08/12/1999	-55.30
BELMONT, TOWN OF	L0068-141	710001-08	GORD	510	NW SE S36 T6S R10E	140 to 170	370 to 340	10/01/2008	-39.33
								02/13/2004	-41.60
BURNSVILLE, TOWN OF	D0052-141	710002-01	PLZC	520	SW SE SE SW S2 T3S R9E	230 to 280	290 to 240	09/30/2008	-95.55
								08/25/1998	-87.75
								01/21/1993	-93.25
								08/03/1987	-91.15
								11/18/1982	-101.30
								10/19/1978	-85.00
								08/02/1977	-81.00
BURNSVILLE, TOWN OF	D0077-141		PLZC	470	SE SW SW SE S2 T3S R9E	197 to 247	273 to 223	06/15/1994	-49.00
DENNIS WA	L0014-141	710003-01	GORD	622	SW NE SE S15 T6S R10E	102 to 172	520 to 450	04/05/2000	-90.30
								01/19/1993	-99.80
								10/01/1976	-88.00
DENNIS WA	L0019-141	710003-02	GORD	580	NE SE S15 T6S R10E	81 to 131	499 to 449	05/01/1976	-57.00
DENNIS WA	L0025-141	710003-03	GORD	620	NE SE S15 T6S R10E	120 to 160	500 to 460	10/20/1978	-93.00
								09/28/1971	-79.23

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)			Elevation of Screen (MSL)			Year	Level (LS)
DENNIS WA	L0045-141	710003-04	GORD	579	NE SE S15 T6S R10E	131	to	161	448	to	418	01/01/1992	-112.00
												08/01/1980	-103.00
DENNIS WA	L0046-141	710003-05	GORD	630	SE SE SE S15 T6S R10E	83	to	145	547	to	485	10/01/2008	-108.97
												04/22/2004	-108.73
												04/05/2000	-106.30
												08/01/1980	-65.00
DENNIS WA	L0049-141	710003-06	GORD	602	SE SW NE S15 T6S R10E	125	to	150	477	to	452	05/04/2000	-68.30
												12/01/1983	-68.00
DENNIS WA	L0064-141	710003-08	GORD	602	SE NE NE S15 T6S R10E	138	to	153	464	to	449	07/29/1999	-72.00
DENNIS WA	L0065-141	710003-07	GORD	585	NE SE NE S15 T6S R10E	130	to	145	455	to	440	08/02/1999	-67.00
DENNIS WA	L0066-141	710003-09	GORD	602	NE SE NE S15 T6S R10E	140	to	160	462	to	442	10/01/2008	-69.26
												04/22/2004	-64.25
												04/05/2000	-63.30
												08/05/1999	-64.00
GOLDEN WA	L0027-141		GORD	553	NE NE NE SE S12 T7S R10E	65	to	115	488	to	438	09/17/2008	-27.40
												04/08/2004	-23.78
												04/06/2000	-24.00
												08/24/1998	-23.32
												01/19/1993	-24.12
												10/20/1978	-28.00
												11/20/1973	-27.74
												11/01/1965	-40.00
GOLDEN WA	L0047-141	710005-01	GORD	558	SW SE SE NE S12 T7S R11E	82	to	107	476	to	451	04/06/2000	-35.80
												01/19/1993	-35.89
												06/20/1980	-33.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
GOLDEN WA	L0048-141	710005-02	GORD	562	NE SE S12 T7S R10E	92 to 117	470 to 445	08/19/1980	-40.00
GOLDEN WA	L0069-141	710005-03	GORD	556	NE SE S12 T7S R10E	95 to 115	461 to 441	04/12/2001	-38.00
IUKA, TOWN OF	E0006-141	710006-01	PLZC	578	SE NE SE SW S13 T3S R10E	285 to 360	293 to 218	10/01/2008	-98.00
								08/25/1998	-80.85
								04/04/1965	-73.00
IUKA, TOWN OF	E0049-141	710006-04	PLZC	580	SW SE S13 T3S R10E	277 to 377	303 to 203	06/01/1991	-101.00
IUKA, TOWN OF	E0053-141	710006-05	PLZC	615	NE SW S13 T3S R10E	304 to 385	311 to 230	07/18/1994	-126.00
MIDWAY PLEASANT HILL WA	E0039-141	710007-01	GORD	680	NW SE S25 T3S R10E	347 to 400	333 to 280	09/30/2008	-121.00
								08/01/1984	-126.00
PARKER, JAMES	E0051-141		GORD	470	NE SW S17 T3S R10E	80 to 100	390 to 370	10/05/1992	-2.00
SHORT COLEMAN PARK WA	B0005-141	710029-02	PLZC	626	SW NW NW NE S1 T2S R10E	210 to 234	416 to 392	10/01/2008	-157.80
								01/21/1993	-155.11
								07/01/1973	-145.90
								04/01/1968	-155.85
SHORT COLEMAN PARK WA	B0016-141	710029-03	PLZC	530	NE NW S1 T2S R10E	46 to 133	484 to 397	07/18/1973	-47.00
								11/01/1970	-53.00
SHORT COLEMAN PARK WA	B0031-141	710008-01	PLZC	460	NW SW SW NE S33 T1S R10E	68 to 98	392 to 362	10/01/2008	-23.52
								04/06/2000	-15.30
								08/25/1998	-18.10
								01/21/1993	-16.00
								09/11/1979	-12.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
TISHOMINGO STATE PARK	K0001-141		PLZC	461	SW NE S31 T5S R11E	21 to 150	440 to 311	07/09/2008	-20.70
								02/08/2006	-15.11
								04/08/2004	-19.65
								08/27/2003	-19.60
								08/22/2002	-20.64
								02/22/2001	-13.84
								09/19/2000	-21.11
								04/19/2000	-14.66
								04/13/1999	-17.89
								03/26/1998	-17.70
								09/24/1997	-20.81
								04/24/1997	-19.36
								03/13/1997	-14.50
TISHOMINGO, TOWN OF	J0062-141	710010-02	GORD	625	NE NE S24 T5S R10E	100 to 120	525 to 505	10/16/2000	-72.20
								04/05/2000	-71.00
								05/01/1978	-72.00
TISHOMINGO, TOWN OF	J0065-141	710010-03	GORD	605	NE NE S24 T5S R10E	69 to 89	536 to 516	10/01/2008	-60.42
								10/16/2000	-59.35
								04/05/2000	-57.50
								11/18/1982	-66.34
								05/01/1978	-54.00

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)			Elevation of Screen (MSL)			Year	Level (LS)
USACE	A0019-141		ETMS	500	NE SW NW SE S35 T2S R9E	106	to	108	394	to	392	09/30/2008	-57.55
												08/25/1998	-54.38
												01/20/1993	-56.50
												08/02/1988	-59.15
												08/12/1987	-57.80
												12/09/1986	-58.44
												11/19/1985	-58.74
												08/22/1985	-58.21
												05/23/1985	-57.35
												02/21/1985	-58.54
USACE	A0020-141		GORD	500	NE SW NW SE S35 T2S R9E	117	to	119	383	to	381	09/30/2008	-57.49
												08/25/1998	-54.16
												01/20/1993	-56.45
												08/02/1988	-59.05
												08/12/1987	-58.09
												12/09/1986	-58.64
												11/19/1985	-58.55
												08/22/1985	-58.17
												05/23/1985	-57.83
												02/21/1985	-58.47
USACE	A0021-141		GORD	500	NE SW NW SE S35 T2S R9E	136	to	138	364	to	362	01/20/1993	-56.30
												02/21/1985	-58.25

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	D0040-141		GORD	484	SE SW SE NE S34 T3S R9E	160 to 190	324 to 294	09/30/2008	-66.03
								11/01/2006	-66.80
								04/08/2004	-65.30
								08/25/1998	-65.45
								01/21/1993	-68.60
								08/03/1987	-67.34
								11/18/1982	-89.90
								03/11/1980	-26.13
								05/15/1979	-42.96
								02/14/1978	-32.18
								02/16/1977	-24.34
								03/09/1976	-22.96
								02/08/1975	-23.54
								03/13/1974	-24.71
								03/01/1973	-22.04
								03/22/1972	-22.00

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	D0041-141		ETMS	484	SE SW SE NE S34 T3S R9E	100 to 150	384 to 334	09/30/2008	-63.40
								11/01/2006	-63.52
								04/08/2004	-62.24
								08/25/1998	-62.60
								01/20/1993	-64.45
								08/03/1987	-63.93
								01/31/1985	-65.13
								11/18/1982	-78.86
								03/11/1980	-25.78
								02/14/1978	-29.86
								03/09/1976	-23.15
								03/12/1974	-23.34
								03/01/1972	-23.00
USACE	D0042-141		ETMS	484	SW WE NE S34 T3S R9E	78 to 88	406 to 396	08/03/1987	-57.09
								02/18/1984	-56.13
								11/18/1982	-61.88
								05/15/1979	-35.10
								05/19/1977	-24.64
								03/12/1974	-24.26
								03/28/1972	-23.04

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	E0015-141		GORD	540	NE NE NW SW S31 T3S R10E	184 to 204	356 to 336	09/30/2008	-65.79
								04/07/2004	-43.20
								08/25/1998	-63.80
								01/20/1993	-65.00
								01/20/1993	-65.00
								05/04/1988	-66.12
								08/03/1987	-66.58
								12/10/1986	-66.30
								01/31/1985	-65.64
								05/17/1984	-64.19
								03/08/1983	-69.38
								11/18/1982	-69.84
								05/19/1981	-57.85
								03/11/1980	-53.38
								05/15/1979	-56.72
								02/15/1978	-53.82
								02/16/1977	-52.48
								03/09/1976	-51.48
								02/08/1975	-51.92
								03/12/1974	-51.67
								03/01/1973	-51.84
								02/01/1972	-51.08

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	E0016-141		ETMS	540	NE NE NW SW S31 T3S R10E	120 to 130	420 to 410	09/30/2008	-57.08
								04/07/2004	-54.95
								08/25/1998	-55.45
								01/20/1993	-56.00
								05/04/1988	-57.93
								12/02/1987	-57.80
								08/12/1987	-57.59
								12/10/1986	-57.04
								01/31/1985	-56.42
								05/17/1984	-55.56
								06/01/1983	-56.93
								11/18/1982	-58.15
								05/19/1981	-51.48
								05/27/1980	-47.10
								05/15/1979	-50.43
								06/08/1978	-46.65
								05/19/1977	-46.60
								03/09/1976	-45.80
								06/25/1975	-46.50
								03/12/1974	-46.20
								03/01/1973	-46.25
								03/02/1972	-47.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	E0032-141		PLZC	580		to	to	07/09/2008	-90.59
								02/08/2006	-84.61
								11/11/2004	-83.72
								08/27/2003	-86.38
								08/22/2002	-88.37
								06/27/2001	-88.43
								09/19/2000	-91.70
								04/17/2000	-86.10
								04/13/1999	-82.32
								03/19/1998	-81.94
								09/24/1997	-85.21
								04/09/1997	-82.91
USACE	E0033-141		GORD	580		to	to	07/09/2008	-69.97
								02/08/2006	-68.27
								11/11/2004	-68.42
								08/27/2003	-66.47
								08/22/2002	-65.29
								06/27/2001	-63.80
								09/19/2000	-62.45
								04/17/2000	-61.55
								04/13/1999	-59.64
								03/19/1998	-57.89
								09/24/1997	-57.08
								04/09/1997	-58.20

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	E0034-141		ETMS	580		to	to	07/09/2008	-95.34
								02/08/2006	-94.10
								11/11/2004	-94.20
								08/27/2003	-94.36
								08/22/2002	-94.49
								06/27/2001	-94.26
								09/19/2000	-95.85
								04/17/2000	-93.80
								04/13/1999	-93.33
								03/19/1998	-93.34
								09/24/1997	-93.51
								04/09/1997	-93.42
USACE	G0015-141		GORD	610	NW SW S20 T4S R10E	230 to 235	380 to 375	01/20/1993	-99.40
								01/01/1992	-99.40
								08/03/1987	-117.11
								11/18/1982	-121.74

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	G0016-141		ETMS	610	NW SW S20 T4S R10E	190 to 200	420 to 410	01/20/1993	-113.40
								05/04/1988	-108.45
								08/13/1987	-106.83
								12/10/1986	-104.90
								01/31/1985	-103.92
								05/17/1984	-103.82
								03/08/1983	-107.10
								11/18/1982	-108.57
								05/13/1981	-105.49
								03/12/1980	-97.80
								05/16/1979	-98.73
								06/08/1978	-92.90
								05/19/1977	-92.38
								03/04/1976	-90.38
								06/25/1975	-89.88
								03/13/1974	-89.94
								03/01/1973	-91.27
								03/01/1972	-92.42
								08/03/1971	-92.56

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	G0017-141		GORD	561	NE NE SE S20 T4S R10E	210 to 250	351 to 311	07/09/2008	-49.38
								11/01/2006	-50.32
								04/07/2004	-47.14
								08/24/1998	-47.59
								01/20/1993	-48.25
								05/04/1988	-52.30
								08/13/1987	-53.04
								12/10/1986	-52.72
								01/31/1985	-53.37
								05/17/1984	-53.53
								06/01/1983	-55.07
								11/18/1982	-58.08
								05/20/1981	-57.50
								08/28/1980	-54.48
								05/15/1979	-50.08
								06/08/1978	-44.60
								05/19/1977	-41.67
								06/10/1976	-39.65
								06/25/1975	-40.55
								03/13/1974	-40.53
								03/01/1973	-41.40
								03/01/1972	-42.00
								08/04/1971	-43.21

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	G0018-141		ETMS	561	NE NE SE S20 T4S R10E	122 to 127	439 to 434	07/09/2008	-45.23
								11/01/2006	-43.75
								04/07/2004	-42.57
								08/24/1998	-41.27
								01/20/1993	-41.87
								05/04/1988	-45.12
								08/13/1987	-45.57
								01/31/1985	-44.12
								08/30/1984	-44.88
								06/01/1983	-44.61
								11/18/1982	-47.41
								08/12/1981	-46.03
								05/27/1980	-39.09
								05/15/1979	-41.62
								06/08/1978	-38.40
								08/03/1977	-38.61
								06/10/1976	-36.53
								06/25/1975	-36.75
								03/13/1974	-36.50
								03/01/1973	-37.40
								03/01/1972	-38.00
								08/04/1971	-38.96

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	G0019-141		ETMS	565	NE NE SE S20 T4S R10E	67 to 72	498 to 493	01/20/1993	-40.37
								05/04/1988	-43.50
								08/13/1987	-44.04
								12/10/1986	-43.20
								01/31/1985	-42.50
								05/17/1984	-42.36
								03/08/1983	-43.69
								11/18/1982	-45.76
								05/20/1981	-43.08
								03/12/1980	-37.62
								05/15/1979	-40.16
								06/08/1978	-37.20
								05/19/1977	-36.69
								03/09/1976	-35.24
								06/25/1975	-35.67
								03/13/1974	-35.44
								03/01/1973	-36.30
								03/07/1972	-37.07
								08/04/1971	-37.87

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	J0018-141		GORD	482	SW SE NW SE S1 T5S R9E	158 to 178	324 to 304	07/09/2008	-35.65
								11/01/2006	-34.83
								04/08/2004	-34.22
								08/24/1998	-33.69
								01/20/1993	-35.00
								05/03/1988	-35.89
								08/13/1987	-35.69
								12/10/1986	-35.64
								01/31/1985	-35.30
								05/17/1984	-35.05
								03/08/1983	-37.15
								11/18/1982	-38.53
								05/19/1981	-36.93
								04/07/1980	-31.46
								05/16/1979	-38.78
								02/15/1978	-34.33
								02/16/1977	-33.90
								03/04/1976	-20.48
								02/08/1975	-21.12
								03/13/1974	-19.98
								03/01/1973	-21.51
								03/21/1972	-21.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.

Owner	USGS # / FIP Code	Health #	Aquifer	LS Elev.	Map Location	Depth of Screen (LS)	Elevation of Screen (MSL)	Year	Level (LS)
USACE	J0019-141		ETMS	482	SW SE NW SE S1 T5S R9E	64 to 74	418 to 408	04/08/2004	-10.70
								08/24/1998	-10.13
								01/20/1993	-10.15
								05/03/1988	-12.85
								08/13/1987	-12.98
								12/10/1986	-12.10
								01/31/1985	-11.51
								05/17/1984	-10.83
								03/08/1983	-11.41
								11/18/1982	-13.16
								05/19/1981	-10.51
								04/07/1980	-7.83
								05/16/1979	-8.96
								06/08/1978	-7.80
								05/19/1977	-8.05
								03/04/1976	-6.08
								06/25/1975	-6.39
								03/13/1974	-6.13
								03/01/1973	-6.83
								03/01/1972	-8.00

The information included in this report is preliminary and has not been checked for discrepancies at this time.