

INFLUENCE OF WATER AVAILABILITY ON SETTLEMENT PATTERNS

Darrel W. Schmitz and Charles L. Wax
Department of Geosciences
Mississippi State University

Jonathan W. Pote
Water Resources Research Institute
Mississippi State University

INTRODUCTION

The type of water source available to support life is strongly connected to human's use of the landscape. Settlement patterns and densities are related to the accessibility of a stable and potable water resource to support domestic use. As technologies for providing more stable and higher quality water sources have emerged through time, populations and settlement distributions have grown and changed. Earliest settlements used primarily surface water, with wells generally not becoming commonplace until the late 1800s. The use of groundwater, with the exception of spring water, was unusual throughout most of the nineteenth century until pollution and disease in surface waters forced people to develop groundwater (Kazmann 1972).

While conducting a base line water resources inventory for the Red Hills generation facility and mine in Choctaw County, Mississippi, it was noticed that the development of water resources in the area appeared to fall into several discrete time categories, each associated with identifiable technological innovations. It was also evident that each of the categories of technology provided certain constraints or opportunities for settlement in the region. Further investigation showed that, in fact, each progressively higher level of technology allowed greater opportunity for a less limiting arrangement of house sites and settlement distribution in the county. The purpose of this study is to document the different levels of water resource technology that were used to support humans as they occupied the land of this region from prehistoric times to the present.

BACKGROUND INFORMATION AND METHOD OF ANALYSIS

The importance of water to the earliest inhabitants and settlers in the Red Hills region is indicated by place names such as Clear Springs, Double Springs, Slate Springs, and Black Wells. Locations of these and others are shown on the 1860 map of the area (Figure 1). A 1905 map (Figure 2) shows an increase in the

number of communities in the study area, encompassing Bankston, Bywy, and French Camp, compared to the 1860 map (Figure 1). It is also illuminating to note that counties surrounding this study area take their names from Choctaw Indian words relating to water resources. For example, "Oktibbeha" is derived from a word that means "pure water," whereas "Noxubee" comes from a word meaning "stinking water" (University Press of Mississippi, 1997). The importance of water is also reflected in the prominently mapped streams (Figure 3).

When the town of Ackerman was 33 years old, a 1916 article in the Jackson Daily News stated "Our water supply comes from springs high up on the rock hillside and is as clear as crystal and about 100% pure. Consequently, no people in any community have better health than our citizens." An article in the Choctaw Plain Dealer in 1949 similarly gave tribute to the water resources by declaring "This area is covered by the greatest of hardwood forests, fed by swift creeks and rushing spring branch water." Local residents report that cotton farmers from Louisville, Mississippi, hauled cotton on wagons to the railroad at Ackerman early in the 1900s, always stopping to camp at Five Mile Springs, located about halfway between the two settlements. These examples illustrate the point that water sources were limiting to habitation patterns early in the settlement of this region, but at the same time provided opportunities for humans.

Advancing technology of water supply development allowed for expansion of the populace. Four main stages of development are noted. First was the utilization of natural springs. This was followed by the construction of dug wells and cisterns as a second stage. The availability of equipment to access greater depths than dug wells provided the third major stage of development--augered wells. The fourth stage identified is that of rotary drilled wells. Rotary drilling technology and changes in supply demands resulted in three different types of drilled wells: 1) initially, domestic wells at individual homesites; 2) public supply wells providing water via pipelines to numerous households; and 3) most recently, larger industrial

wells. Each of the newer technologies increasingly removed constraints of location, resulting in greater choice of home sites not limited by water sources.

SPRINGS

Native Americans utilized springs as water sources, and their camping sites were thus often geographically restricted to the locations of the springs. When Europeans began to settle the area, they also initially utilized springs as their water source. The first European settlers off the Natchez Trace homesteaded at the same springs the Native Indians had used. Figure 4 shows a spring at a location known as the Edwards homesite, one of the first European homesites in the county. The Edwards' homestead first showed up on the 1837 property rolls in Choctaw County and is representative of this level of technology which began in prehistoric times and is still in use today in a few cases.

DUG WELLS AND CISTERNS

As springs were finite, additional growth in settlement required a different method of obtaining fresh water. The first of the new methods was that of dug wells and cisterns. Hand-dug wells have been excavated since the late 1800s even until relatively recent years. They achieved depths of up to about 36 feet. Earlier wells were lined with rock, followed in time by brick, and finally, in more recent years, with concrete cylinders. Dug wells are usually 30 to 36 inches in diameter as the one shown in Figure 5 and are open at the base to allow groundwater to seep into the well. Cisterns were bricked and enclosed at the base to hold rain water runoff from rooftops of houses, as opposed to dug wells. However, cisterns are often similar in appearance to dug wells.

AUGURED WELLS

Just after World War II, military surplus equipment allowed wells to be bored or augured to greater depths. Augured wells allowed homes to have a more stable fresh water supply or to replace shallow, dug wells or spring sources which were more susceptible to pollution and forms of water-borne disease. Eight to nine inch concrete culverts were commonly used to case the hole. These augured wells reached depths to 50 -60 feet normally, but several were in excess of 100 ft. Water was obtained with a narrow bailer and crank, as shown on the ground next to the augured well in Figure 6.

DRILLED WELLS

Domestic

Technology again entered the picture, allowing for even deeper access to fresh water by drilling with a rotary and fluid system. Drilled wells for domestic supplies proliferated in the late 1950s and into the 1960s. The casings in these drilled wells are commonly 2 inch diameter galvanized pipe and for the first time utilized electricity for power to a rod-type, above-ground pump. The depths are up to about 400 feet, although most are from 100 feet to 300 feet in depth. Figure 7 shows an example of such a well that is still in use today.

Essentially any location in the area could now have its own fresh-water source as long as electricity was available. Pumps have also been added to some springs, dug wells, and augured wells to provide a more convenient water supply. Some of each are also still in use today.

Public

Due to the availability of federal grant monies during the 1970s, rural water associations were created in an attempt to provide almost everyone with dependable and good quality water via a water line. Due to a large source of funds that most individuals did not have available, these wells could be drilled deeper, reaching over 400 feet. They also utilized larger diameter ten-inch steel casings with submersible pumps to provide larger amounts of water to a larger population segment. Individual well maintenance and water treatment was no longer necessary. This is the primary source for all domestic water used in the region today, replacing all other sources because of convenience, dependability, and health reasons. The associations' water lines cover nearly all parts of the region, allowing unlimited expansion of house sites and settlement distribution.

Industrial

Due to the industrial needs of the Red Hills development, greater quantities of water are needed. This resulted in wells drilled to depths of around 3000 feet, with even larger diameter steel casings and submersible pumps to obtain water from previously untapped aquifers. Although these aquifers have poorer quality, they provide the greater quantity needed, and are not competing with domestic and public potable sources.

SUMMARY

During the base line water resources inventory, all existing and former sources of water were located as far as possible. About 90 springs were located, a few of which are in use today. Around thirty dug wells and several cisterns were located. A few of the dug wells are still in use today, but no in-use cisterns were found. About forty augered wells were located, of which a few still are in use. Of the nearly 90 domestic rotary drilled wells, only about 10 are still in use. However, all four public supply wells located are still in use and water supply lines from wells outside the study area supplied water to some area residents. Two industrial wells have been drilled, with more planned.

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