



Aquifers, Groundwater, and Their Importance From the Beginning

When studying the use of wells to supply groundwater, you will find many stories that date back to about 2100 B.C. Many of our ancient civilizations were based on ample supplies of groundwater. General interest in drilling rather than digging wells developed in the 12th Century with the successful drilling of a well at Artois, France in 1126. The term "artesian" is derived from the name of this community.

Here in the Lowcountry, the groundwater found in the aquifers beneath the surface have played a vital role in supplying water since the first settlers arrived in Charleston in 1668. From 1668 through the early 1800s, Charlestonians obtained drinking water from rain water in cisterns and groundwater withdrawn from shallow wells. It is believed, the first artesian well in America was drilled on Queen Street near King Street in 1820 in Charleston, SC. It was not until 1823 that the first flowing well was constructed.

The 1,260-foot deep artesian well flowed 28 feet above ground at Meeting and Wentworth Streets. Although City officials held high hopes that this well would successfully flow enough water for the city, they were disappointed when it yielded only small amounts of water. It took fifty years of trial and error, engineering ingenuity, and advances in the field of well construction before artesian wells would successfully provide enough water to become the primary source of water in Charleston. These wells were used for years and provided water to Charleston's residences. Understanding the importance and need for water, officials continued to search for more water from the aquifers beneath the Lowcountry. In 1876, a 1,970 foot well was drilled at Marion Square. This was the first well to be drilled into the Middendorf Aquifer. The well naturally flowed over 100 feet above ground. After producing 700,000 gallons of water per day, it was thought to be the first successful artesian well in the region. However, it seemed the demand was always greater than the supply.

After seven years of construction, a third well located on Lee Street came online and produced one million gallons per day. Although it appeared the water problem was solved, it was found necessary to construct another well at Nassau and Stewart Streets. While these wells were naturally producing about 2 million gallons of water per day, only 1 million gallons of water per day flowed to the reservoir. The downside was that each time a new well was brought online, the pressure in the aquifer declined and so did the flow.

From 1878 to 1904 the city's water supply came from private wells, cisterns, and the artesian well supply which withdrew groundwater. When water production began to decline in the 1920s, Charleston was forced to abandon use of the aquifer and switch to a surface-water source to ensure a sufficient supply of water for Charleston's growing population.

The Middendorf Aquifer is the primary source of water for many upper and lower Coastal Plain communities.

Mount Pleasant Waterworks began formal operation of a water distribution system from three shallow wells in 1935, but it was not until 1969 that MPW began withdrawing groundwater from the Middendorf Aquifer. The groundwater from the Middendorf Aquifer is obtained by six deep wells that MPW has installed or operated since 1969. Other important Middendorf Aquifer water uses in Charleston, Berkeley, and Dorchester County area include Kiawah Island, Isle of Palms, and Seabrook Island, and for industrial use in Berkeley County.

In 2015, it was noted by USGS that groundwater levels had declined from about 126 feet above land surface in downtown Charleston prior to pumpage to approximately 40 feet below land surface. Over time, the decline in pressure reduced the natural flow from the wells and created the need to utilize pumps to withdraw groundwater from the aquifer. There are presently a number of users of Middendorf Aquifer groundwater who utilize high tech wells with pumps to remove millions of gallons of water per day.

Looking back, history has proven that we have and will continue to depend on the groundwater from the Middendorf Aquifer. It is up to the current users, regulators, and you to work together to protect and sustain this precious natural resource.

Stay tuned next week and learn about the capacity use areas, plans, and laws established to protect and sustain groundwater.