Google

South Carolina Groundwater Fact Sheet

Google's proposed groundwater usage is deemed sustainable, representing less than 1% of total McQueen Branch aquifer flow in the data center area.

As we seek to expand our data center in Berkeley County, South Carolina, we anticipate needing more power to run the servers, and more water to cool them.

From the start, we've been committed to saving water in the broader region by operating our data centers in a highly energy efficient manner. Since power generation typically requires using water for cooling purposes, being energy efficient translates to greatly reduced embedded water usage. We've also developed a Best Management Practices (BMP) for using groundwater document with the South Carolina Department of Health and Environmental Control Bureau of Water.

In 2016, we applied for a permit to withdraw groundwater from the McQueen Branch/Middendorf aquifer, one major water-bearing component of the Coastal Plain groundwater resource system accessible in the data center vicinity. We expended thorough due diligence efforts to confirm that the proposed groundwater usage would be sustainable and not harm the aquifer and other users. As part of this effort, we incorporated the results of tests and projections made available to the public by the U.S. Geological Survey.

The results indicate that over 200 million gallons per day (MGD) of naturally recharged groundwater flows through the McQueen Branch aquifer in the data center area[1]. Furthermore, any groundwater that is not withdrawn by the pumping of wells from the McQueen Branch will naturally discharge through shallower aquifers and into the Atlantic Ocean.This is the case even with established users – such as the Town of Mount Pleasant [Mount Pleasant Water (MPW)] and Nucor Steel – also pumping groundwater to meet their respective needs. Our proposed groundwater withdrawal of 1.5 MGD is less than 1% of that flow.

Additional justification for Google's conclusion that its proposed withdrawal of 1.5 MGD is supportable by the available aquifer recharge, and will have minimal impact on other existing users is provided by the recent USGS study (SIR 2017-5128, v.1.1) focused on evaluating the impacts from increasing pumping at over 10 MGD from the Middendorf aquifer by MPW (dated November 2017, but released in Spring of 2018). MPW subsequently submitted a groundwater withdrawal permit application for increasing its current pumping from the Middendorf aquifer (the lower portion identified as the Charleston aquifer) to 10.8 MGD (3,953,000,000 gallons per year) on September 20, 2018.

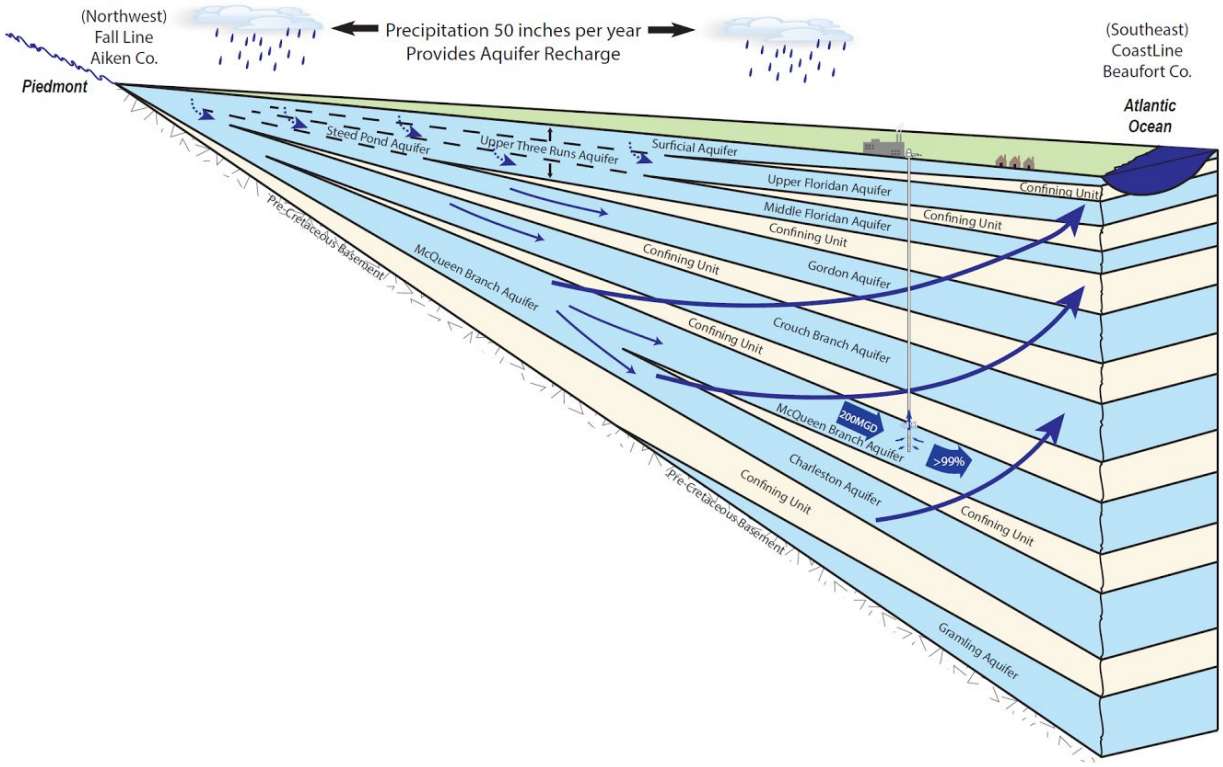
The recent USGS study assumed a "background" average total pumpage from the Middendorf (McQueen Branch) lower than Google's more conservative background condition – so our projections would basically project a worse-case scenario than the USGS did. The recent USGS model projected the drawdown at the MPW wells resulting from the pumping of a "theoretical well" at Moncks Corner at 0.5 MGD and 1.5 MGD,

[1] When modeling the groundwater being pumped by other well users, we used data from 2004 because it was the best available data at the time. That data is conservative, because more groundwater was being pumped from this McQueen Branch aquifer in 2004 than is being pumped today.

which were about 3 feet and 8 feet, respectively. Google's model results indicated respective drawdown values of 4 and 12 feet, respectively, reflecting more conservative conditions and assumptions. The initial USGS projection assumes that simultaneous to the theoretical Moncks Corner well being pumped, that the MPW Wells are pumping cumulatively at 8.58 MGD (USGS Scenario 1). Relatively speaking, these amounts reflect an insignificant impact relative to the MPW wells. The USGS report does not cast a negative characterization of the potential impact from the increased pumping of the MPW wells or the theoretical Moncks Corner/ Google's Well. Given the corroboration by the USGS model of our evaluation results, there is no basis to conclude that the pumping of MNK Well TW-1 at 1.5 MGD would adversely impact the current or future needs of MPW, nor that MPW's proposed increase is not supportable by the Middendorf aquifer.

The full results are summarized in the groundwater withdrawal permit application that was submitted to the South Carolina Department of Health & Environmental Control. Based on these results, Google believes that our proposed groundwater use will be sustainable.

NATURAL GROUNDWATER MOVEMENT SHOWING INSIGNIFICANCE OF GOOGLE'S PROPOSED GROUNDWATER USAGE



Increased water usage at the Google data center in Berkeley County, South Carolina, would amount to 1.5 MGD, less than 1% of the McQueen Branch aquifer flow in the area.[2]

[2] Source: Modified by Leggette, Brashears, & Graham, Inc. from Figure B37 of United States Geological Survey Professional Paper 1773.