



Groundwater Study Frequently Asked Questions (FAQs)

The LCPCC Groundwater Study references private well drillers' data called "static water level" which are based on individually drilled wells and hydrostudy reports which are based on subdivision development requirements that reference "safe yield." (Q9 and Q10 provide an explanation of each term).

Q.9 Loudoun County requires a hydrostudy when permitting any subdivision larger than 9 lots. A hydrostudy aims to answer the question of whether there's enough groundwater to serve the development based on "Safe Yield." What does the term "Safe Yield" mean?

A: The term "Safe Yield" refers to the maximum long-term rate at which groundwater can be withdrawn without causing a persistent decline in water levels or damaging the aquifer system. It's essentially the "sustainable pumping limit" for a well, aquifer, or water supply system.

The Loudoun County Facilities Standards Manual, states that a "Safe Yield" estimate shall include the extent of the 1-foot drawdown contour based on 150 gallons per day being pumped at all proposed wells.

It is difficult to estimate safe yield. In western Loudoun, the groundwater geology of fractured bedrock is very complex making it difficult to create an accurate model by just looking at one part of the groundwater basin. There simply aren't enough test wells. And hydrologic studies done for building projects in western Loudoun aren't sufficient to assess the region's groundwater problem.

When proposing a new development requiring household wells, a hydrologist typically will look at how much pumped well water is returned through the septic drainfield. Then he calculates an estimate using a proxy well (meant to reflect all wells for the proposed subdivision) or a numerical model to predict what happens after 90 days without any rainfall. Some studies address the variability of the aquifer characterization by including ranges in the values of transmissivity and storativity. This results in ranges in the drawdown predictions adding to the uncertainty is the safe yield estimate.

The safe yield estimate from a hydrostudy report may be more or less accurate depending on when it was produced and the relative well density at the time. It may not even address drawdown since it was for agricultural purposes or a municipal well. In general, safe yield estimates offer a caution about overpumping a well as opposed to cautioning against impact on other wells.

More details on hydrostudy reports may be found at https://loudoungroundwater.org/wp-content/uploads/2026/02/Appendix_Safe_Yield_Reduced.pdf