ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Determining the Reliable Capacity of a Private Water Supply Well and Pumping System

The State of New Hampshire does not regulate how much water a private well shall yield. Some towns have adopted ordinances requiring private wells produce a specific amount of water prior to issuing occupancy or building permits; check with your local authority to find out more. In general, people use 75 gallons of water per day for domestic water uses (washing, drinking, cleaning, etc.) and high volumes of water in short durations (ex. 30 gallons during one 6-minute shower). If your well can produce the amount of water needed for each person in a short period of time, and groundwater recovers back into the well fast enough to be able to provide that water every day, your wells capacity should reliably meet your water needs.

The New Hampshire Water Well Board suggests that a minimum water supply capacity for domestic indoor household use should be at least 600 gallons of water within a two-hour period once each day. This is equivalent to a flow rate of 5 gallons per minute (gpm) for two hours. In addition, the New Hampshire Water Well Association recommends a flow rate of 4 gpm for a period of four hours as an optimum water supply capacity for a private domestic supply. This volume is equivalent to 960 gallons of water within a four-hour period and should be adequate for all indoor domestic use as well as a modest amount of outdoor use. Although it may be considered a hardship by many homeowners, homes can run off wells with water supply capacities less than the suggested amounts above. When using a low-yield water supply, homeowners may need to space-out when water is used, follow water conservation measures, and install protection devices on pump systems to prevent damage if the water level drops below the pump.

When a well is installed, the driller reports a well yield. This reported yield is very useful, however, the amount of water that can be reliably produced by the well is affected by several conditions, such as:

1) Static groundwater level measured in the well.
2) Depth of well.
3) Pump depth setting, pump controls, pump efficiency and pump horsepower rating.
4) Storage/pressure tank size and performance.
5) Condition of plumbing system.

To determine whether a well and associated water system meets the water supply capacity recommendations above, a short pumping test can be performed where the well is discharging at a known rate and the groundwater level is monitored before, during and after the pumping period. Licensed water well contractors and pump installers have the experience and equipment to thoroughly

assess the capacity of a well. The procedures described below are meant to provide a homeowner with general guidance on how to assess the capacity of a well using the installed water system.

☠ **CAUTION**: To prevent electrical shock, turn off the power to the well pump before the well cap is taken off and when it is reinstalled. Do not let the well pump run dry. If the well pump beings pumping air or higher than usual amounts of sediment, or the pumped water is greatly discolored, shut off the pump immediately.

1) After the well has not been used for several hours **estimate the initial depth to water** in the well. Homeowners do not typically own devices that accurately measure the depth of groundwater in a well. The water level can be estimated by taking off the well cap and dropping an ice cube in the well and measuring the time it takes it to land in water. Do not drop anything other than ice in the well. For example, if it takes 4 seconds for an ice cube to fall into the well water, the depth to water would be calculated as: 16 x (4 seconds) x (4 seconds) = 256 feet.

   16 x (time measured in seconds) x (time measured in seconds) = approx. depth to water in feet

2) Using an outdoor water spigot, a hose, a 5-gallon bucket and a stopwatch, begin to pump water from the well and **measure the flow / discharge rate**. It is best to use a spigot that does not go through water treatment devices and has a nozzle or valve so flow can be adjusted. Turn on the well pump. Measure the flow rate as the time it takes to fill up the 5-gallon bucket. Discharge water at a rate of five gallons per minute for two hours (for a total of 600 gallons) or discharge water at a rate of four gallons per minute for four hours (for a total of 900 gallons).

3) Once the desired volume of water has been pumped and immediately after the well pump is turned off **estimate the stressed (pumping) depth to water** using the procedure described in Step 1. The well pump should turn off after the hose spigot is closed and pressure builds back up in the system. Keep the well pump off as you monitor recovery of the water level (Step 4).

4) **Estimate the recovery depth to water** in the well 30 minutes and 1 hour after the pump is turned off. Then, estimate the depth to water in the well again two hours and again in four hours (if the four-hour test was conducted).

5) **Calculate the percent of water recovery** in the well using the estimated initial depth to water and the stressed depth to water recorded just after the pump turned off and the recovery depth to water recorded at the time period equal to the duration of pumping. This calculation is completed using the formula:

(stressed depth to water – recovery depth to water) ÷ (stressed depth to water – initial depth to water) x 100%

If the depth to water exhibits no or slow recovery after pumping (less than 75%recovery over a period equal to the duration of pumping), this indicates that the capacity of the water system may significantly diminish after several days of use. Talk with a license water well contractor to discuss mitigation options for a low-yielding well.

For More Information

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or dwgbinfo@des.nh.gov or visit our website at www.des.nh.gov.

Note: This fact sheet is accurate as of September 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.