



Rural Water Note

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Simple Pumping Tests for Farm Water Bores □ September 2007

Ground water supplies are derived from deep bores, shallow bores, wells and soaks.

The available supply from a bore is usually assumed to be the same as the driller's estimate when it was first drilled.

The safe yield of the supply needs to be estimated by conducting a simple pump test after the bore is completed.

Once the bore has been in service for a while, most people estimate the supply by observing how many stock it can support and converting this to a daily flow.

Supplies from other bores may be limited by the size of pump used to extract the water.

If you have a new bore or are unsure of the safe yield of an existing bore, a driller's estimate is a poor way to estimate the available supply from the bore. Many people confuse this estimate with the long-term supply or safe yield of the bore, which could vary by as much as 50 per cent from the original estimate. The only true method of assessing a bore is to conduct a simple pump test on it.

How to do a pump test

A pump test measures changes in the water level of a bore during long-term pumping. By looking at the response, you can determine a safe pumping rate.

Measure the water level in the bore before you start the pump test. If the bore has been in recent use, let it recover to a static or stable level before proceeding. The driller's records should tell you

the depth of water when drilled, along with the bore and casing depths.

Set up a pump and pump the supply at the estimated rate for at least eight hours at a continuous rate equal to either the driller's estimate or the rate at which you hope to extract water from the bore.

After the start of pumping, measure the drawdown (water level in the bore) every five minutes for the first half hour, every half hour for the next two hours and hourly for the rest of the test. Record the results carefully; you can draw them on graph paper to view the response.

If this pumping rate can be maintained without using more than two-thirds of the available drawdown then this is a reasonable estimate. If the drawdown is more than or less than two-thirds of the available drawdown, adjust the pumping rate accordingly. This will give a reasonable estimate of the amount of water you can safely draw from a ground water supply (bore, well or soak).

If you have a supply you have been drawing on for some time, you will already have a good idea of the volume of water you can draw based on experience. Just be sure the capacity of the pump is not the limiting factor.

Measuring water levels in bores and recording results during the pump test

This can be difficult during a pump test, particularly at the beginning of the test or if pumping equipment is of a similar diameter to the casing.



Record times as close to the recommended intervals if possible and use a stopwatch if available to record the exact time you measure the water level.

Try to measure the depth as accurately as possible. Plotting the results on a graph (time vs depth) will allow you to visually interpret the results.

The depth to water in the bore can be measured using a tape measure with an attachment that will make a noise signal or gives some indication when it touches the water surface. Try a bath plug, flat circular disc such as a fox whistle or an indicator stick. If possible, measure and record the depth of water from ground level.

During the test, make sure that any water pumped from the bore is disposed of as far away as possible from the bore. If water can re-enter the system being pumped, the results will not be meaningful.

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