ISSUE 7

Measuring Well Water Levels

Measuring the water level in your well is an important part of maintaining your well.

Why should I measure the water level in my well?

Measuring and recording water level readings over time ensures you will have enough data to catch any water shortages long before your well goes dry. It will also help you determine the cause of a decline in water production.

The **non-pumping (static) water level** (Figure 1) in your well will move up and down on a seasonal basis, rising in the winter and spring when precipitation levels are higher and dropping in summer and fall when precipitation rates go down and your water use is higher. What you don't want to see is a steady decline in the non-pumping water level over time.

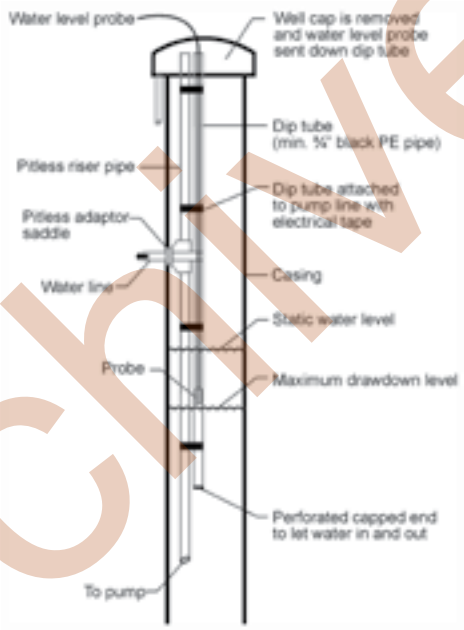
Being consistent when you take water level measurements ensures you have reliable data to compare. The non-pumping water level should always be measured in the early morning, before the pump has turned on and the water level in the well has been allowed to fully recover from the previous day's use.

The pumping water level is the level the water lowers to when pumping is in progress. It is best to take pumping water level measurements at the same time of the day, when the pump is operating and there has been significant water use. Then you are sure to have comparable data.

> Measuring the water level in your well can help you prevent over-pumping. See the *Over-pumping Your Well* fact sheet for more information.

Figure 1:

Well diagram showing static water level, dip tube and maximum drawdown level



You should take all water level measurements on a monthly or quarterly basis. The more data points you have the more likely you are to be alerted to any changes.

What will the well water level readings tell me?

A steady decline in the non-pumping water level over time means the amount of water available in the aquifer is declining. This can be caused naturally by periods of drought. It can also happen when the volume of water being pumped from a well exceeds the rate at which the aquifer is capable of naturally replenishing itself.

Sometimes when landowners share the same aquifer for their water supply there is insufficient water to meet everyone's demand. Multiple withdrawals of groundwater from a single aquifer have a cumulative effect; so, when pumping in the area collectively exceeds the natural recharge rate to the aquifer, each well owner will experience a decline in the non-pumping water level in their well.

Changes in the pumping water level indicate a decline in well efficiency and the ability of your well to produce water. When the non-pumping water level remains steady but the pumping water level is dropping, there is usually something blocking the perforations or screened section of the well, preventing water from entering.

Plugging of the intake portion of the well can be caused by build-up of biological slimes and nuisance (i.e. iron or sulphate-reducing) bacteria. It can also be caused by mineral incrustation or sediment.

A lower discharge rate from the pump and a higher pumping water level could mean a problem with the pump in your well.

You will need to hire a licensed water well contractor to assess what is causing the reduced efficiency of the well and how to rehabilitate it, if possible. Generally speaking, the production capacity of a well should not be allowed to decline by more than twenty percent of its original capacity or it will likely be too costly to repair.

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How do I take proper well water level measurements?

Have a licensed water well contractor install a dip tube (Figure 1) in your well. A dip tube can be constructed using a minimum 18 mm (3/4 in) plastic pipe or hose that is lowered into the well to below the pumping water level. It should be taped to the pump line with electrical tape and have a capped bottom with two, 6 mm (1/4 in) holes perforated on the bottom to let water in and out, allowing it to fluctuate identically to the water inside of the well.

The dip tube should extend 1.5 m (5 ft) above the top of the pump. You will also need a water level sounder (Figure 2) to be able to monitor water levels.

Figure 2:

Water level sounder

A sounder (also called a "water tape") is available for sale or rent from licensed water well contractors or water treatment equipment suppliers. It is a good investment as it is an accurate tool for taking water level measurements. The well sounder can be lowered inside the dip tube to measure the water level, with no threat of getting it entangled in the pumping equipment.

An alternative method to the dip tube and traditional water level sounder is the non-intrusive, but more expensive, sonic water level sounder (Figure 3).

Figure 3:

Sonic water level sounder

Collecting and reviewing water level measurements over a number of years will reveal any seasonal variations in the amount of water available in the aquifer and show trends on how your well performs when the pump is running.

Without regularly monitoring your well changes can go unnoticed until it is too late and repairs become too costly or the well goes dry.

Whenever your well is serviced by a licensed water well contractor be sure to have them measure the water level in your well. These measurements should be kept in your records.

These measurements can be recorded on the *Water Well Management Log Sheet*.

Always disinfect your well after any repair work or alterations are done to your well and pumping equipment. See the *Shock Chlorinating Your Well* fact sheet for more information.

Contact your licensed water well contractor to discuss options for increasing the capacity of an inadequate water supply.

FOR MORE INFORMATION:

Working Well
www.workingwell.alberta.ca

Water Wells That Last
A comprehensive water well management guide
http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/wwg404

Alberta Water Well Drilling Association
For a list of licensed water well drillers in your area, visit the Association's website at www.awwda.com

CONTACT US:

General Questions?
Alberta Environment and Parks
Information Centre
Phone: 310-3773 toll free

Technical Questions?
Ag-Info Centre
Phone: 310–FARM (3276) toll free