

wellcare[®] information for you about: Determining Static Water Level in a Well

If your household is one of the millions that depend upon private water wells, you and your well rely on groundwater. An adequate, dependable supply of ground water, replenished throughout the year by rainfall and melted snow is essential to make sure your well provides you with the water you need. Drought and other weather conditions can influence the amount of water in your well. This information sheet explains what is involved in determining the static level of water in your well. WSC recommends you contact a qualified water well contractor for this and whenever you need well maintenance.

What is Static Water Level?

Static water level refers to the level of water in a well under normal, undisturbed, no-pumping conditions. Static water level is best determined when the well has not been pumped for several hours prior to measuring. You may get a false reading if the well was pumped just before the static water level is measured.

How is Static Water Level Measured?

There are several ways to measure the static water level including: an electric sounder or electric depth gauge, wetted tape or an air line.

Electric Sounder or Electric Depth Gauge

An electric sounder or depth gauge is the most practical method for measuring well water levels. It consists of a weight suspended on stranded insulated wire with depth markings and an ammeter to indicate a closed circuit. Current flows through the circuit when the end of the wire touches the water surface. Current is supplied by a small 9 or 12-volt battery.

To collect a reading, the contractor lowers the electric wire or sounding line until the needle deflects then reads the distance from the water to the top of the casing on the line. He marks the reference point on the casing where he measured the depth. And, then he uses a standard tape measure to measure the distance between the marks on the line.

Wetted Tape

This method is accurate for measuring water levels to depths up to about 90 feet. To use this method, you must know the approximate depth to water in your well.

In this method, a lead weight is attached to the end of a 100 foot steel measuring tape. Eight to ten feet of tape end is dried and coated with carpenter's chalk before each measurement. The tape is lowered into the well until a part of the chalked section is below the water. The contractor will align and note an even foot mark on the tape exactly at the top of the casing or some other measuring point. Then, the tape is pulled up to read the mark where the line is wet. He can determine the actual depth from the top of the casing to water level by subtracting the wetted mark from the mark he held at the top of the casing.

Air Line

An air line may be the best method for repeated testing of deep wells over 300 feet.

This method consists of a small diameter pipe or tube long enough to extend from the top of the well to a point about 20 feet below the lowest anticipated water level. Air is pumped into the line and excess air bubbles are forced out the end, equalizing the pressure in the line with the pressure created by the depth of water outside the line. Quarter-inch copper or brass tubing, or ¼-inch steel or plastic pipe are commonly used for this method.

For this method, the exact length of air line is measured as it is placed in the well. The contractor makes sure the air line is airtight by hanging it vertically, taking care that it doesn't spiral inside the well casing. The best way is to attach the air line securely to a known point on the pump column. The end of the air line is attached low enough so that it's submerged when the pump operates at full discharge. **NOTE: The air line has to be at least 5 feet above the suction intake of the pump to avoid pulling air through the pump.**

By noting the number of pipe joints, the contractor will know the depth of the air line tip. He will fit the upper end with a tee and pressure gauge plus a valve to which a hand pump is attached. Then he can calibrate the gauge to indicate pressure directly in feet of water or pounds per square inch (psi). Once installed with the pressure gauge connected, the contractor will pump air into the air line until the pressure shown by the gauge levels off at a constant maximum indicating that all water has been forced out of the line. At this point, air pressure in the tube (as shown by the gauge) just supports the column of water from water level in the well to the bottom of the tube. This water column length is equal to the amount of air line submerged.

Deduct this pressure, converted to feet (pounds pressure x 2.31 = feet), from the known length of the air line to determine the amount of submergence.

For more information about Determining Static Water Level

Oregon State Extension Services. Measuring Water Well Levels.
<http://extension.oregonstate.edu/catalog/pdf/ec/ec1368.pdf>

Ohio Department of Natural Resources Division of Water. Water Efficiency for Private Well Owners.
<http://www.dnr.state.oh.us/portals/7/pubs/pdfs/fctsht03.pdf>

Ministry of Agriculture, Food, and Rural Affairs. Private Water Well Owners – Dealing With Water Shortages. Retrieved June 14, 2011 from <http://www.omafr.gov.on.ca/english/engineer/facts/99-025.htm#q8>

For more information about wells and other wellcare® publications



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Well owners and others with questions about wells or groundwater can also contact the FREE wellcare® Hotline at 1-888-395-1033 or visit www.wellcarehotline.org.

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