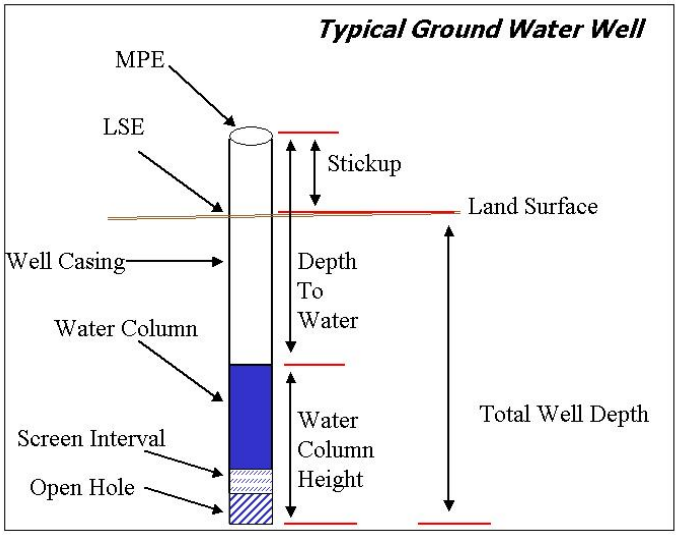
Updated August 26, 2015

Ground Water Well Definitions



Depth to Water: (DTW) Distance from measuring point elevation (MPE) to the top of the water column.

Total Well Depth: Distance from LSE to the bottom of the well.

Casing Depth: Distance from LSE to the bottom of the well casing.

MPE: Measuring Point Elevation. A fixed mark on the well casing where depth to water measurements are taken. Usually reported in feet above mean sea level.

LSE: Land Surface Elevation. The general land surface elevation of the ground around the wellhead. Usually reported in feet above mean sea level.

Water Column Height (WCH): Height (measured in feet) in the well from the bottom of the well to the top of the water column.

Stickup (SU): Distance between MPE and LSE.

Well Screen: A perforated section of the well casing designed to keep formation sediments from collapsing into the borehole while allowing water to enter the casing.

Screen Interval: Distance (measured in feet) from the top to the bottom of the well screen.

Open Hole: The drilled area below casing and screen interval where the well continues in the rock.

Equations

Potentiometric: Total Depth – (DTW-SU)= WCH, WCH x volume constant = purge volume
Tape/chalk: Total Depth –((Held at – Wetted at) – SU) = WCH

WCH x well volume constant* = 3 purge volumes

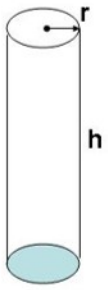
*Well volume constants are calculated for 3 purge volumes.
NOTE: These equations must be worked in the proper order according to the parentheses.

Updated August 26, 2015

Well Volume Constants

Radius: r
Volume: V
Height: h
$V = \pi r^2 h$

$\pi = 3.141592$ r = diameter ÷ 2



For Wells, the units for r will be inches and the units for h are feet. Therefore, you must convert in such a way that both variables are in the same unit. Typically one would convert feet into inches.

Example: How many gallons are in a 4 inch well with 10 feet of water in it?

r = 2 inches (Diameter = 4", so 4 ÷ 2 = 2)
h = 10 feet
$\pi = 3.141592$
V = ? gallons

$V = 3.141592 \times (2 \text{ inches})^2 \times (10 \text{ ~~feet~~} \times \frac{12 \text{ inches}}{1 \text{ ~~feet~~}}) \rightarrow V = 3.141592 \times 4 \text{ inches}^3 \times 120 \text{ inches}$

$\therefore$ V = 1507.96 cubic inches of water

1 cubic inch = 0.004329004 gallons

$\therefore 1507.96 \text{ ~~cubic inches~~} \times \frac{0.004329004 \text{ gallons}}{1 \text{ ~~cubic inch~~}} = 6.53 \text{ gallons}$

So, a 4 inch well with 10 feet of water contains 6.53 gallons of water.

Multiply 6.53 by 3 to calculate the three purge volumes

6.53 gallons x 3 = 19.6 gallons to be purged.

The above math can be reduced by using the following **well volume constants** for 3 well volumes:

1" well = 0.12 gallons/ft. 2" = 0.48 3" = 1.10 4" = 1.96 6" = 4.41 8" = 7.83

12" = 17.63 14" = 23.99