Solution to drawdown problem

Radius of influence (R) for a well may be calculated using the following equation:

$$R = b*(SQRT(K/(2*N))),$$

where b is the thickness (100m), K is hydraulic conductivity (1e-5 m/sec), and N is the recharge (0.75 m/yr or 2.378e-8 m/sec).

$$R = 100*(SQRT(1e-5/(2*2.378e-8))) = 1450 \text{ m}$$

The drawdown at 5 m may be calculated using the following equation:

$$s_2-s_1 = (Q/(2\pi*K*b))*\ln(r_1/r_2)$$

Since we know that at the radius of influence for the well (R) drawdown is zero, the equation becomes

$$s_2 = (Q/(2\pi*K*b))*\ln(R/r_2),$$

where Q is flow rate (1 m^3/minute or 0.0167 m^3/sec), K is hydraulic conductivity (1e-5 m/sec), b is the thickness (100m), R is radius of influence (1450 m), and r_2 is 5 m.

$$s_2 = (0.0167/(2*3.1416*1e-5*100))*\ln(1450/5) = 15 \text{ m}$$