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Characteristic Well Losses Formulas

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List of 16 Characteristic Well Losses Formulas

Characteristic Well Losses

Aquifer Loss

1) Aquifer Loss Coefficient

Open Calculator

fx $$B = \frac{\log\left(\left(\frac{R}{r}\right), e\right)}{2 \cdot \pi \cdot k \cdot b_w}$$

ex $$30.0852 = \frac{\log\left(\left(\frac{100m}{2.94m}\right), e\right)}{2 \cdot \pi \cdot 0.01cm/s \cdot 15.0m}$$

2) Aquifer Loss given Aquifer Loss Coefficient

Open Calculator

fx $$BQ = B \cdot Q$$

ex $$28.5325m = 28.25 \cdot 1.01m^3/s$$

3) Aquifer Loss given Drawdown

Open Calculator

fx $$BQ = s_t - CQ^n$$

ex $$27.48m = 28.0m - 0.52m$$

4) Coefficient of Permeability given Aquifer Loss Coefficient

Open Calculator

fx $$k = \frac{\log\left(\left(\frac{R}{r'}\right), e\right)}{2 \cdot \pi \cdot B \cdot b_w}$$

ex $$0.01065\text{cm/s} = \frac{\log\left(\left(\frac{100\text{m}}{2.94\text{m}}\right), e\right)}{2 \cdot \pi \cdot 28.25 \cdot 15.0\text{m}}$$

5) Discharge given Aquifer Loss

Open Calculator

fx $$Q = \frac{BQ}{B}$$

ex $$0.976991\text{m}^3\text{/s} = \frac{27.60\text{m}}{28.25}$$

6) Drawdown given Well Loss

Open Calculator

fx $$s_t = BQ + CQ^n$$

ex $$28.12\text{m} = 27.60\text{m} + 0.52\text{m}$$

7) Radius of Well given Aquifer Loss Coefficient

Open Calculator

fx $$r' = \frac{r_i}{\exp(B \cdot 2 \cdot \pi \cdot k \cdot b_w)}$$

ex $$2.237443\text{m} = \frac{2.92\text{m}}{\exp(28.25 \cdot 2 \cdot \pi \cdot 0.01\text{cm/s} \cdot 15.0\text{m})}$$

Specific Capacity of Well

8) Aquifer Loss Coefficient given Specific Capacity

Open Calculator

fx $$B = \frac{\left(\frac{Q}{S_c}\right) - CQ^n}{Q}$$

ex $$26.51218 = \frac{\left(\frac{1.01\text{m}^3/\text{s}}{0.037\text{m}^2/\text{s}}\right) - 0.52\text{m}}{1.01\text{m}^3/\text{s}}$$

9) Aquifer Loss given Specific Capacity

Open Calculator

fx $$BQ = \left(\frac{Q}{S_c}\right) - CQ^n$$

ex $$26.7773\text{m} = \left(\frac{1.01\text{m}^3/\text{s}}{0.037\text{m}^2/\text{s}}\right) - 0.52\text{m}$$

10) Discharge given Specific Capacity

Open Calculator

fx $$Q = S_c \cdot s_t$$

ex $$1.036\text{m}^3/\text{s} = 0.037\text{m}^2/\text{s} \cdot 28.0\text{m}$$

11) Drawdown given Specific Capacity of Well

Open Calculator

fx $$s_t = \frac{Q}{S_c}$$

ex $$27.2973\text{m} = \frac{1.01\text{m}^3/\text{s}}{0.037\text{m}^2/\text{s}}$$

12) Specific Capacity given Aquifer Loss

Open Calculator

fx $$S_c = \left(\frac{Q}{CQ^n + BQ}\right)$$

ex $$0.035917\text{m}^2/\text{s} = \left(\frac{1.01\text{m}^3/\text{s}}{0.52\text{m} + 27.60\text{m}}\right)$$

13) Specific Capacity given Drawdown

Open Calculator

fx $$S_c = \frac{Q}{s_t}$$

ex $$0.036071\text{m}^2/\text{s} = \frac{1.01\text{m}^3/\text{s}}{28.0\text{m}}$$

14) Well Discharge given Specific Capacity

Open Calculator

fx $$Q = S_c \cdot (CQ^n + BQ)$$

ex $$1.04044\text{m}^3/\text{s} = 0.037\text{m}^2/\text{s} \cdot (0.52\text{m} + 27.60\text{m})$$

Well Loss

15) Well Loss given Drawdown

Open Calculator

fx $$CQ^{n} = s_{t} - BQ$$

ex $$0.4\text{m} = 28.0\text{m} - 27.60\text{m}$$

16) Well Loss given Specific Capacity

Open Calculator

fx $$CQ^{n} = \left(\frac{Q}{S_{c}}\right) - BQ$$

ex $$-0.302703\text{m} = \left(\frac{1.01\text{m}^3/\text{s}}{0.037\text{m}^2/\text{s}}\right) - 27.60\text{m}$$

Variables Used

- **B** Aquifer Loss Coefficient
- b_w Aquifer Thickness *(Meter)*
- **BQ** Aquifer Loss *(Meter)*
- CQ^n Head Loss in Well *(Meter)*
- **k** Coefficient of Permeability *(Centimeter per Second)*
- **Q** Discharge *(Cubic Meter per Second)*
- **R** Radius of Investigation *(Meter)*
- r_i Radius of Influence *(Meter)*
- r' Radius of Well *(Meter)*
- S_c Specific Capacity *(Square Meter per Second)*
- s_t Total Drawdown *(Meter)*

Constants, Functions, Measurements used

- Constant: **pi**, 3.14159265358979323846264338327950288
  Archimedes' constant
- Constant: **e**, 2.71828182845904523536028747135266249
  Napier's constant
- Function: **exp**, exp(Number)
  n an exponential function, the value of the function changes by a constant factor for every unit change in the independent variable.
- Function: **log**, log(Base, Number)
  Logarithmic function is an inverse function to exponentiation.
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Speed** in Centimeter per Second (cm/s)
  Speed Unit Conversion
- Measurement: **Volumetric Flow Rate** in Cubic Meter per Second (m^3/s)
  Volumetric Flow Rate Unit Conversion
- Measurement: **Kinematic Viscosity** in Square Meter per Second (m^2/s)
  Kinematic Viscosity Unit Conversion

Check other formula lists

- **Basic Definitions Formulas**
- **Characteristic Well Losses Formulas**
- **Confined Aquifers Formulas**
- **Unsteady Flow Formulas**

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