# Important Open Wells Formulas PDF

Formulas
Examples
with Units

**List of 12**
**Important Open Wells Formulas**

## 1) Depression Head for Flow Discharge into Well Formula

Evaluate Formula

Formula

$$H = \frac{Q_f}{K_0}$$

Example with Units

$$7.0012\,\text{m} = \frac{30.0\,\text{m}^3/\text{s}}{4.285}$$

## 2) Flow Discharge into Well Formula

Evaluate Formula

Formula

$$Q_f = K_0 \cdot H$$

Example with Units

$$29.995\,\text{m}^3/\text{s} = 4.285 \cdot 7\,\text{m}$$

## 3) Proportionality Constant for Flow Discharge into Well Formula

Evaluate Formula

Formula

$$K_0 = \frac{Q_f}{H}$$

Example with Units

$$4.2857 = \frac{30.0\,\text{m}^3/\text{s}}{7\,\text{m}}$$

## 4) Recuperation Test Formulas

### 4.1) Area of Well given Specific Capacity per unit Well Area of Aquifer Formula

Evaluate Formula

Formula

$$A = \frac{K_0}{K_s}$$

Example with Units

$$5.7133\,\text{m}^2 = \frac{4.285}{0.75}$$

### 4.2) Area of Well given Time Interval Formula

Evaluate Formula

Formula

$$A = K_0 \cdot \frac{T_r}{\ln\left(\frac{H_1}{H_2}\right)}$$

Example with Units

$$21.1362\,\text{m}^2 = 4.285 \cdot \frac{2\,\text{s}}{\ln\left(\frac{15.0\,\text{m}}{10.0\,\text{m}}\right)}$$

## 4.3) Area of Well when Discharged from Open Well is Considered Formula

Evaluate Formula

Formula

$$A = \frac{Q_Y}{K_s \cdot H}$$

Example with Units

$$20\,\text{m}^2 = \frac{105\,\text{m}^3/\text{s}}{0.75 \cdot 7\,\text{m}}$$

## 4.4) Depression Head when Discharge from Open Well is Considered Formula

Evaluate Formula

Formula

$$H = \frac{Q_Y}{K_s \cdot A}$$

Example with Units

$$7\,\text{m} = \frac{105\,\text{m}^3/\text{s}}{0.75 \cdot 20\,\text{m}^2}$$

## 4.5) Discharge from Open Well under Depression Head Formula

Evaluate Formula

Formula

$$Q_Y = K_s \cdot A \cdot H$$

Example with Units

$$105\,\text{m}^3/\text{s} = 0.75 \cdot 20\,\text{m}^2 \cdot 7\,\text{m}$$

## 4.6) Equation for Time Interval Formula

Evaluate Formula

Formula

$$T_r = \left(\frac{A}{K_0}\right) \cdot \ln\left(\frac{H_1}{H_2}\right)$$

Example with Units

$$1.8925\,\text{s} = \left(\frac{20\,\text{m}^2}{4.285}\right) \cdot \ln\left(\frac{15.0\,\text{m}}{10.0\,\text{m}}\right)$$

## 4.7) Proportionality Constant given Specific Capacity per unit well Area of Aquifer Formula

Evaluate Formula

Formula

$$K_0 = A \cdot K_s$$

Example with Units

$$15 = 20\,\text{m}^2 \cdot 0.75$$

## 4.8) Proportionality Constant per unit Well Area of Aquifer Formula

Evaluate Formula

Formula

$$K_0 = A \cdot \left(\left(\frac{1}{T_r}\right) \cdot \ln\left(\frac{H_1}{H_2}\right)\right)$$

Example with Units

$$4.0547 = 20\,\text{m}^2 \cdot \left(\left(\frac{1}{2\,\text{s}}\right) \cdot \ln\left(\frac{15.0\,\text{m}}{10.0\,\text{m}}\right)\right)$$

## 4.9) Specific Capacity per unit Well Area for Discharge from Open Well Formula

Evaluate Formula

Formula

$$K_s = \frac{Q_f}{A \cdot H}$$

Example with Units

$$0.2143 = \frac{30.0\,\text{m}^3/\text{s}}{20\,\text{m}^2 \cdot 7\,\text{m}}$$

## Variables used in list of Open Wells Formulas above

- **A** Area of the Well *(Square Meter)*
- **H** Depression Head *(Meter)*
- $H_1$ Drawdown at the Start of Recuperation *(Meter)*
- $H_2$ Drawdown at a Time *(Meter)*
- $K_0$ Proportionality Constant
- $K_s$ Specific Capacity
- $Q_f$ Flow Discharge *(Cubic Meter per Second)*
- $Q_Y$ Yield from an Open Well *(Cubic Meter per Second)*
- $T_r$ Time Interval *(Second)*

## Constants, Functions, Measurements used in list of Open Wells Formulas above

- Functions: **ln**, ln(Number)
  *The natural logarithm, also known as the logarithm to the base e, is the inverse function of the natural exponential function.*
- Measurement: **Length** in Meter (m)
  *Length Unit Conversion*
- Measurement: **Time** in Second (s)
  *Time Unit Conversion*
- Measurement: **Area** in Square Meter (m²)
  *Area Unit Conversion*
- Measurement: **Volumetric Flow Rate** in Cubic Meter per Second (m³/s)
  *Volumetric Flow Rate Unit Conversion*

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