Important Distance Drawdown Analysis Formulas PDF

Formulas
Examples
with Units

List of 10
Important Distance Drawdown Analysis Formulas

1) Drawdown across One Log Cycle from Distance Drawdown Graphs given Transmissivity Formula

Evaluate Formula

Formula

$$\Delta s_D = 2.3 \cdot \frac{q}{T \cdot 2 \cdot \pi}$$

Example with Units

$$0.2329 = 2.3 \cdot \frac{7\,\text{m}^3/\text{s}}{11\,\text{m}^2/\text{s} \cdot 2 \cdot 3.1416}$$

2) Drawdown across One Log Cycle given Transmissivity for Inconsistent Units Formula

Evaluate Formula

Formula

$$\Delta s = 70 \cdot \frac{q}{T}$$

Example with Units

$$44.5455 = 70 \cdot \frac{7\,\text{m}^3/\text{s}}{11\,\text{m}^2/\text{s}}$$

3) Pumping Rate from Distance Drawdown Graphs Formula

Evaluate Formula

Formula

$$q = T \cdot 2 \cdot \pi \cdot \frac{\Delta s_D}{2.3}$$

Example with Units

$$7.0017\,\text{m}^3/\text{s} = 11\,\text{m}^2/\text{s} \cdot 2 \cdot 3.1416 \cdot \frac{0.233}{2.3}$$

4) Pumping Rate given Transmissivity for Inconsistent Units from Distance-Drawdown Graphs Formula

Evaluate Formula

Formula

$$q = T \cdot \frac{\Delta s}{70}$$

Example with Units

$$7.0007\,\text{m}^3/\text{s} = 11\,\text{m}^2/\text{s} \cdot \frac{44.55}{70}$$

5) Storage Coefficient for Inconsistent Units from Distance Drawdown Graphs Formula

Evaluate Formula

Formula

$$S = T \cdot \frac{s_t}{640} \cdot r_o^2$$

Example with Units

$$0.0096 = 11\,\text{m}^2/\text{s} \cdot \frac{0.035\,\text{m}}{640} \cdot 4.0\,\text{m}^2$$

6) Storage Coefficient from Distance-Drawdown Graphs Formula

Evaluate Formula

Formula

$$S = 2.25 \cdot T \cdot \frac{s_t}{r_o^2}$$

Example with Units

$$0.0541 = 2.25 \cdot 11\,\text{m}^2/\text{s} \cdot \frac{0.035\,\text{m}}{4.0\,\text{m}^2}$$

7) Time at which Drawdowns are measured for Storage Coefficient Formula

Evaluate Formula

Formula

$$s_t = S \cdot \frac{r_o^2}{2.25 \cdot T}$$

Example with Units

$$0.0352\,\text{m} = 0.0545 \cdot \frac{4.0\,\text{m}^2}{2.25 \cdot 11\,\text{m}^2/\text{s}}$$

8) Transmissivity for Inconsistent Units from Distance Drawdown Graphs Formula

Evaluate Formula

Formula

$$T = 70 \cdot \frac{q}{\Delta s}$$

Example with Units

$$10.9989\,\text{m}^2/\text{s} = 70 \cdot \frac{7\,\text{m}^3/\text{s}}{44.55}$$

9) Transmissivity from Distance Drawdown Graphs Formula

Evaluate Formula

Formula

$$T = 2.3 \cdot \frac{q}{2 \cdot \pi \cdot \Delta s_D}$$

Example with Units

$$10.9974\,\text{m}^2/\text{s} = 2.3 \cdot \frac{7\,\text{m}^3/\text{s}}{2 \cdot 3.1416 \cdot 0.233}$$

10) Transmissivity given Storage Coefficient from Distance Drawdown Formula

Evaluate Formula

Formula

$$T = \frac{S \cdot r_o^2}{2.25 \cdot s_t}$$

Example with Units

$$11.073\,\text{m}^2/\text{s} = \frac{0.0545 \cdot 4.0\,\text{m}^2}{2.25 \cdot 0.035\,\text{m}}$$

Variables used in list of Distance Drawdown Analysis Formulas above

- **q** Pumping Rate *(Cubic Meter per Second)*
- r_o Distance from Pumping Well to Point Intersection *(Meter)*
- **S** Storage Coefficient
- s_t Total Drawdown *(Meter)*
- **T** Transmissivity *(Square Meter per Second)*
- **Δs** Drawdown Across One Log Cycle
- Δs_D Drawdown Across Log Cycle

Constants, Functions, Measurements used in list of Distance Drawdown Analysis Formulas above

- constant(s): **pi**, 3.14159265358979323846264338327950288 *Archimedes' constant*
- Measurement: **Length** in Meter (m)
  Length 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

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