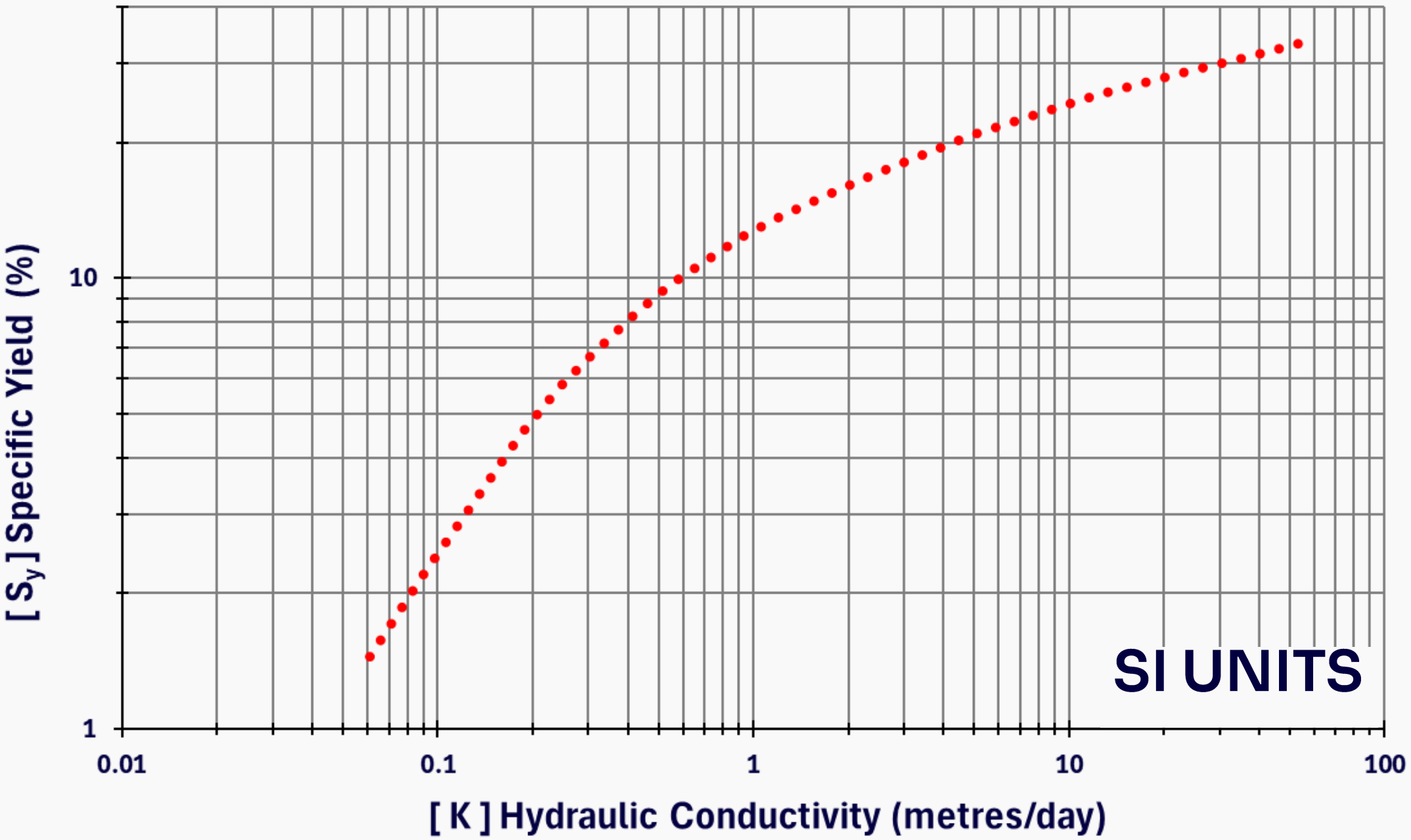
Estimating Specific Yield from Hydraulic Conductivity



$$S_y = 24.991K - 0.0614, \qquad 0.06 < K \leq 0.2 \text{ m/d}$$

$$S_y = 5.0734 \ln(K) + 12.707, \qquad 0.2 < K < 61 \text{ m/d}$$

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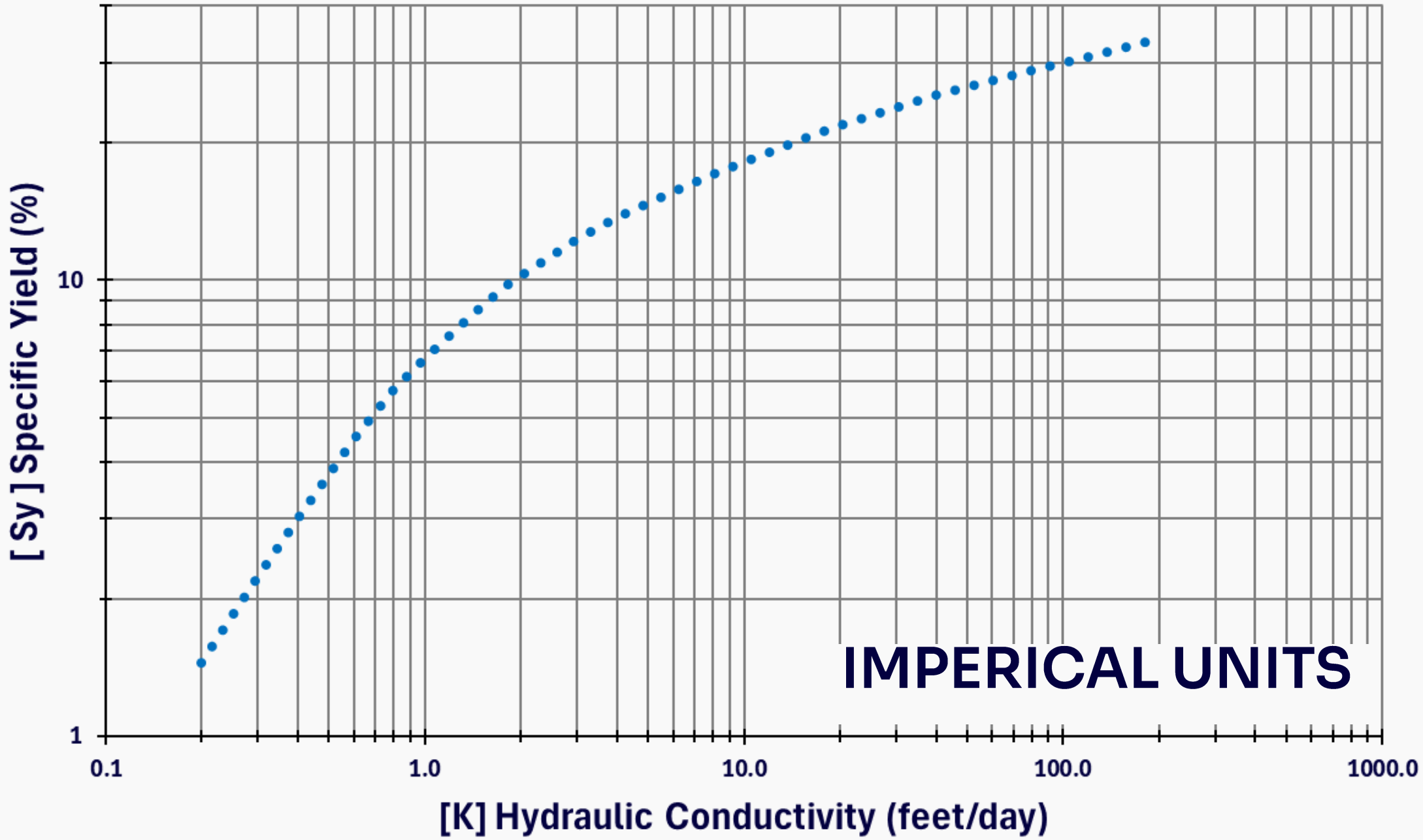

$$S_y = 7.6191K - 0.0614, \qquad 0.20 < K \leq 0.70 \text{ ft/d}$$

$$S_y = 5.0734 \ln(K) + 6.6808, \qquad 0.70 < K < 200 \text{ ft/d}$$

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When to use this

Use this graph to estimate specific yield from hydraulic conductivity when site-specific specific yield data is not available.

Use it as an estimate, not as a substitute for site-specific testing.

Limitations

- This empirical relationship is valid only for hydraulic conductivity values between 0.061 m/d (0.2 ft/d) and 61 m/d (200 ft/d).
- It is intended for unconsolidated earth materials such as silt, sand, and gravel, not consolidated rock or fractured bedrock.

Curve Info

This curve is an empirical correlation between specific yield and hydraulic conductivity published in the U.S. Bureau of Reclamation *Drainage Manual*.

It was developed from about 2,000 laboratory tests on undisturbed samples, together with about 100 in-place hydraulic conductivity tests. The underlying data covered a wide range of unconsolidated earth materials.

Reading the Graph

You can read the graph directly, but because it is plotted on a log-log scale this requires some visual interpretation.

Alternatively, you can use the fitted equations by entering your known K values.

Two equations are needed because the curve changes shape across the range shown. It is linear at lower hydraulic conductivity values and logarithmic at higher values.