# Program Description

This program Calculates the required pumping discharge quantity Q, to succeed

the desirable water drawdown, modeling the rectangular excavation as one big well

# Input Values

Permeability index (K): 1.90e-06 m/s

Hydraulic head of the original water table (H): 90.00 m

Excavation depth from surface-lower water table (hd0): 7.60 m

Ground water table depth, from surface (hwl): 0.90 m

Length of excavation area (a): 60.00 m

Width of excavation area (b): 25.00 m

# Formulas and Operations

Required flow drawdown (hd) = hd0 - hwl

hd = 7.60 - 0.90 = 6.70 m

Hydraulic head at maximum dewatering (hw) = H - hd

hw = 90.00 - 6.70 = 83.30 m

Radius of influence of Well or Point Source (r1) = 3000 \* (H - hw) \* sqrt(K)

r1 = 3000 \* (90.00 - 83.30) \* sqrt(1.90e-06) = 27.71 m

Equivalent radius of the well (rw) = sqrt(a \* b / pi)

rw = sqrt(60.00 \* 25.00 / pi) = 21.85 m

Total Radius of influence of Well (R) = r1 + rw

R = 27.71 + 21.85 = 49.56 m

Pumping rate (Q) = (pi \* K \* (H^2 - hw^2)) / ln(R / rw)

Q = (pi \* 1.90e-06 \* (90.00^2 - 83.30^2)) / ln(49.56 / 21.85) = 0.0085 m3/s

Pumping rate (Qls) = Q \* 1000

Qls = 0.0085 \* 1000 = 8.46 l/s