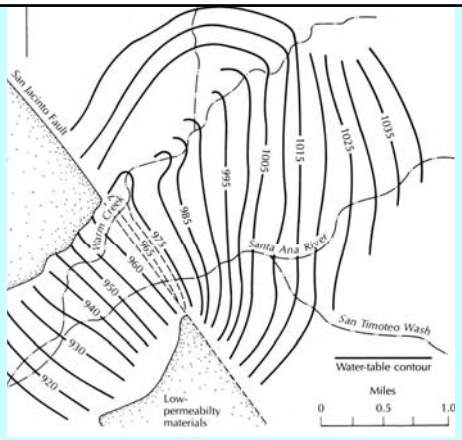
Estimate the flux through Colton Narrows in the 1940s

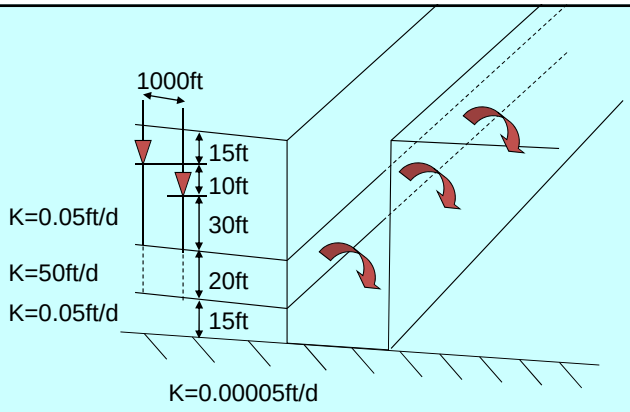
Average K ~$5x10^{-6}$ ft/sec

Sediment thickness ~1400 ft

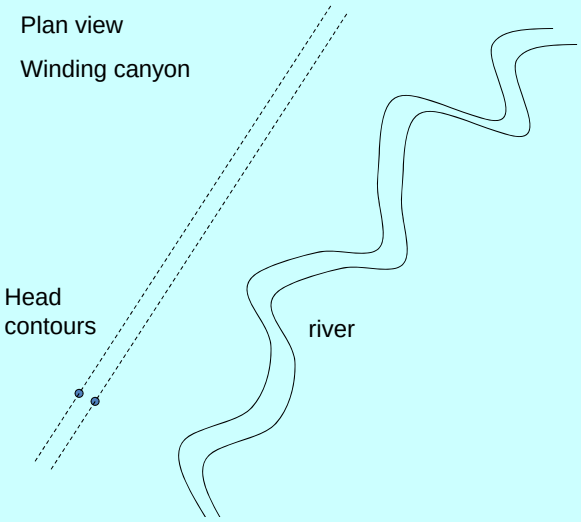



$$Q = KiA = 5x10^{-6}\ \frac{ft}{sec}\ \frac{15\ ft}{0.25mi\ \frac{5280ft}{1\ mi}}\ 1mi\ \frac{5280ft}{1\ mi}\ 1400ft = \sim 0.4\ \frac{ft^3}{sec}$$

$$Q \sim 0.4\ \frac{ft^3}{sec}\ \frac{60sec}{1min}\ \frac{60min}{1\ hr}\ \frac{24hr}{1day}\ \frac{365.25day}{1yr}\ \frac{1AcreFt}{43560ft^2} \sim 300AFY$$



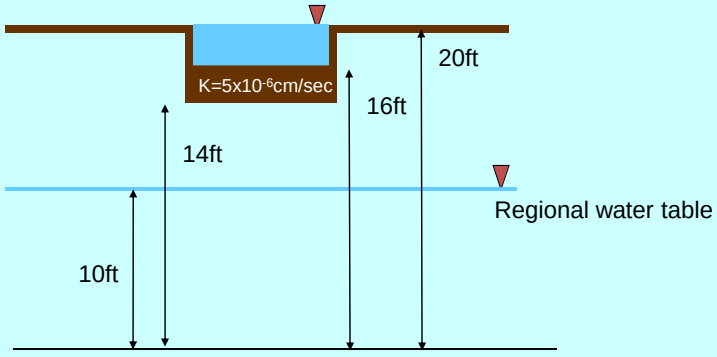

$$Q = KiA = 50\ \frac{ft}{day}\ \frac{10\ ft}{1000ft}\ 20ft\ 1ft = 10\ \frac{ft^3}{day\ ft\ length\ of\ canyon} = 10\ \frac{ft^2}{day}$$




**No change in estimate for reasons discussed in class**

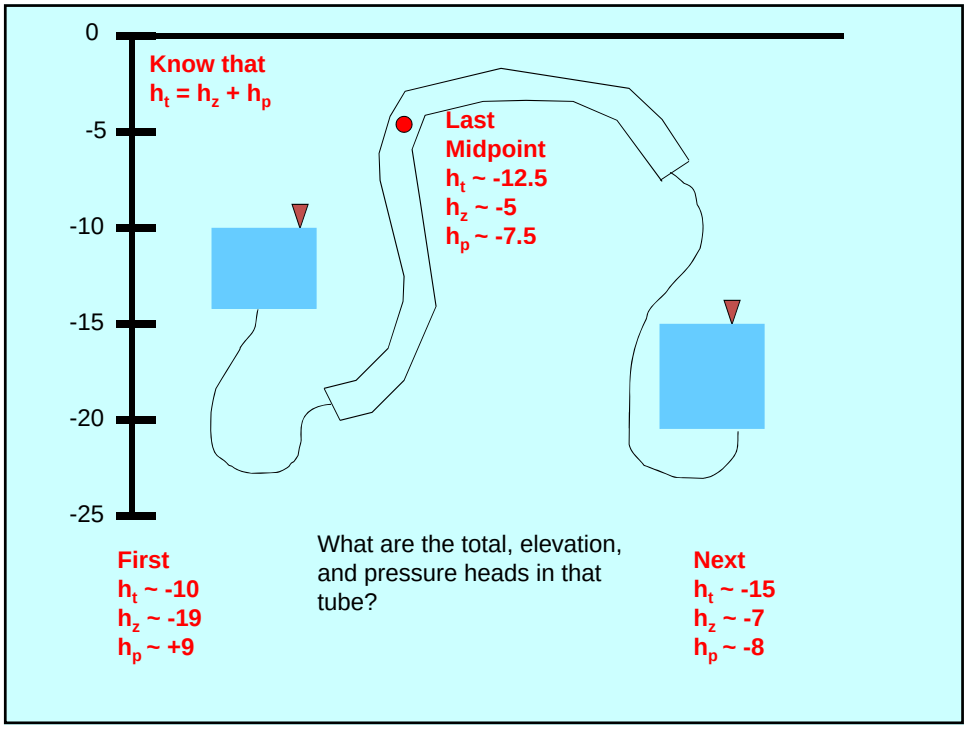
$$Q = KiA = 50\ \frac{ft}{day}\ \frac{10\ ft}{1000ft}\ 20ft\ 1ft = 10\ \frac{ft^3}{day\ ft\ length\ of\ canyon} = 10\ \frac{ft^2}{day}$$

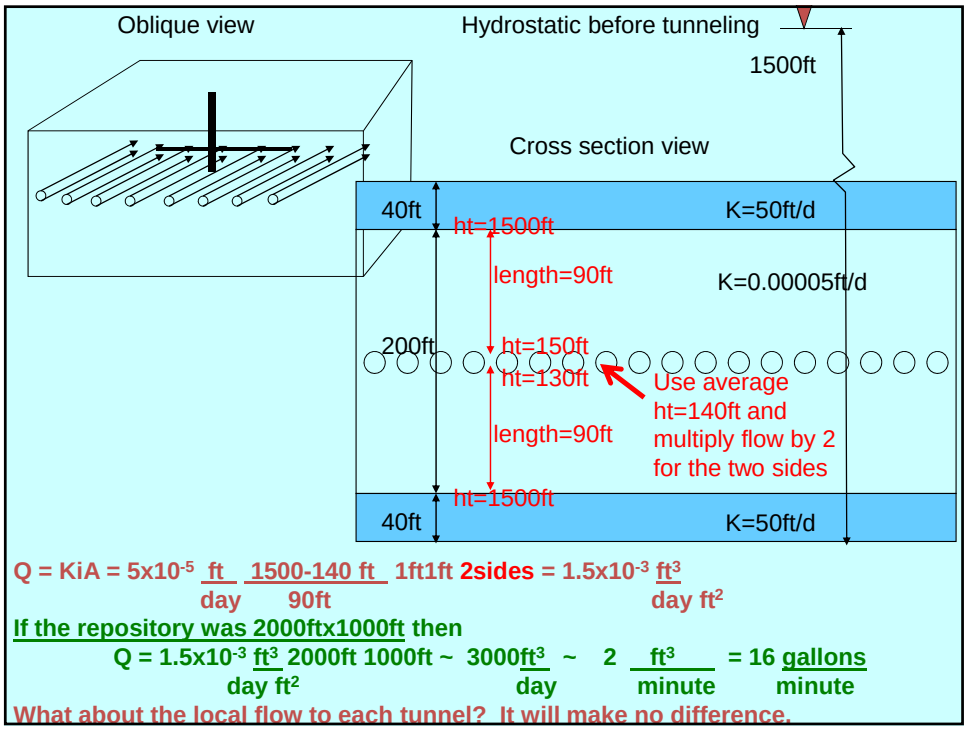
What is the rate of leakage from the pond?




$$Q = KiA = 5x10^{-6}\ \frac{cm}{sec}\ \frac{1in}{2.54cm}\ \frac{1ft}{12in}\ \frac{20\text{-}14\ ft}{2ft}\ 1ft^2 = 5x10^{-7}\ \frac{ft^3}{sec\ ft^2\ of\ pond} = 5x10^{-7}\ \frac{ft}{sec}$$

If the pond was 7feet x 10 feet: $3x10^{-5}\ \frac{ft^3}{sec} = 1200\ \frac{ft^3}{year}$ = 0.025 AFY




$Q = KiA = 5x10^{-5} \frac{ft}{day} \frac{1500-140\ ft}{90ft} 1ft1ft\ \mathbf{2sides} = 1.5x10^{-3} \frac{ft^3}{day\ ft^2}$

If the repository was 2000ftx1000ft then

$Q = 1.5x10^{-3} \frac{ft^3}{day\ ft^2} 2000ft\ 1000ft \sim \frac{3000ft^3}{day} \sim 2 \frac{ft^3}{minute} = 16 \frac{gallons}{minute}$

What about the local flow to each tunnel? It will make no difference.