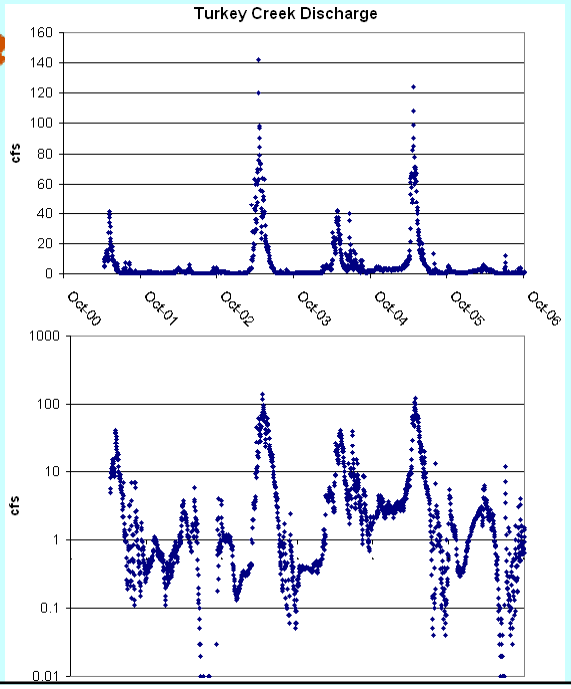
http://inside.mines.edu/~epoeter/_GW/03Budget2/TCB-StreamGage-GWclass.xls

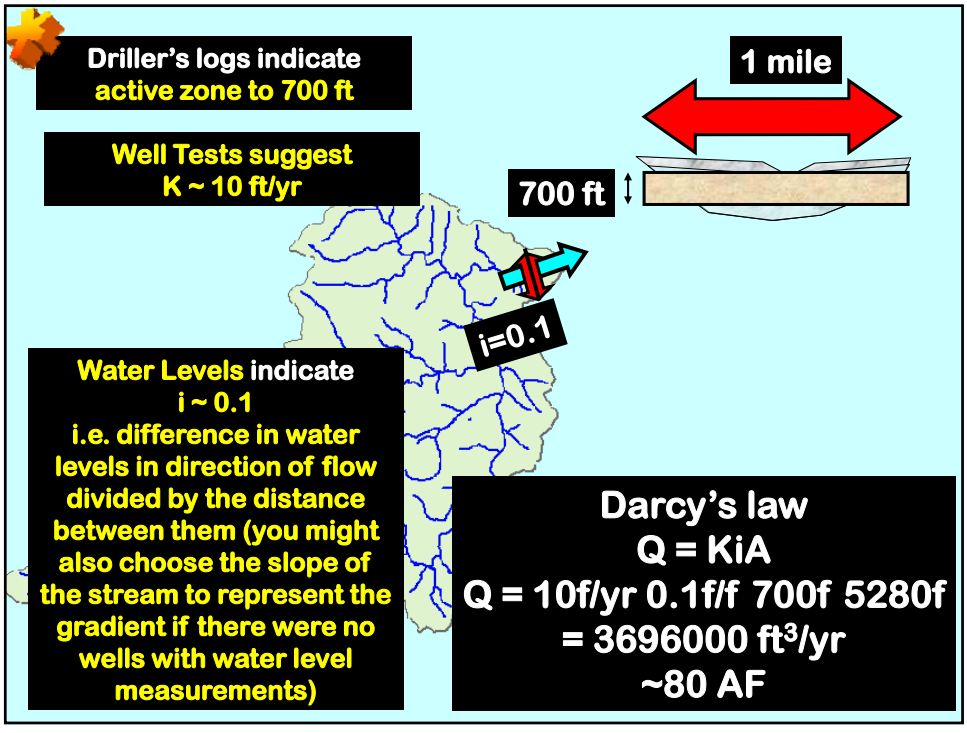


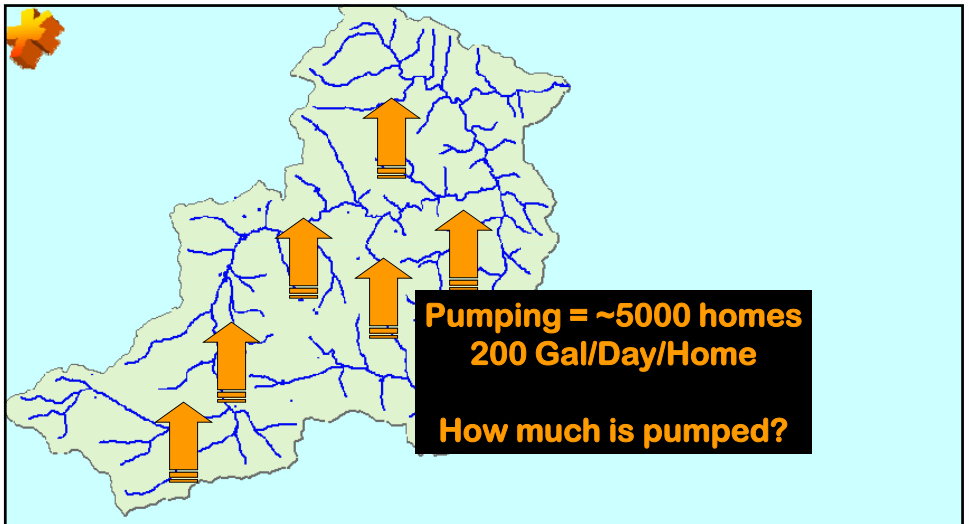
The volume of water discharged over a period of time is the area under the curve

$\frac{ft^3}{sec}$ sec = ft^3

If you estimate the average flow rate and multiply by the # secs in a year you will have the average volume per year.

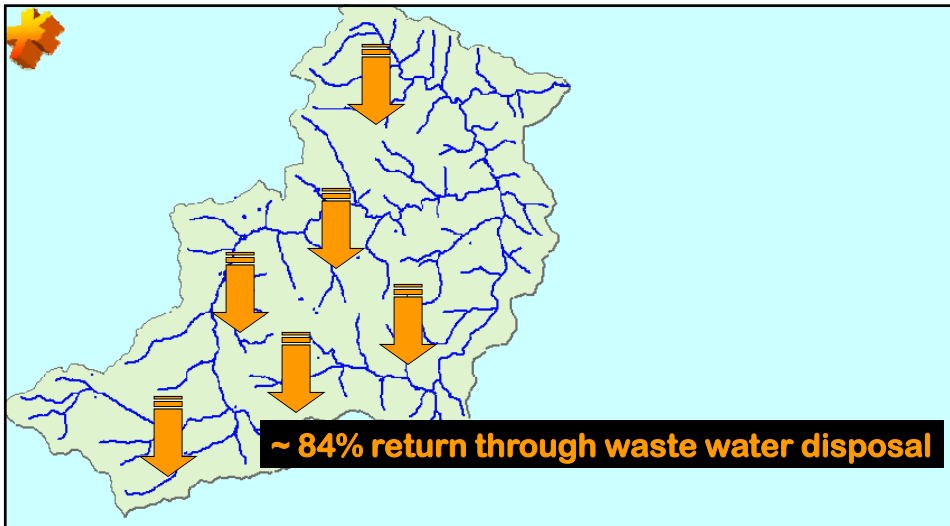
~4000 AF/YR





$$5000\ \text{Homes} \times \frac{200\ \text{Gal}}{\text{Day Home}} \times \frac{365\ \text{Day}}{\text{YR}} \times \frac{1\ \text{FT}^3}{7.48\ \text{Gal}} \times \frac{1\ \text{AC}}{43560\ \text{FT}^2} = \frac{1120\ \text{AF}}{\text{YR}}$$

~ 1000 AFY



$$\text{Consumption is only} \quad 0.16 * \frac{1120\ \text{AF}}{\text{YR}} = \frac{179\ \text{AF}}{\text{YR}}$$

~ 200 AFY

COMPONENTS OF A BASIN WATER BUDGET

INFLOW = OUTFLOW + CHANGE IN STORAGE

IN'S

	PRECIPITATION	+ SW INFLOW	+ GW INFLOW	+ IMPORTED WATER	=
TCB	50000 AF	+ 0	+ 0	+ 0	= 50000 AF
PAN	500 ml	+ 0	+ 0	+ 300 ml	= 800 ml

OUT'S

	ET + EVAPORATION	+ SW OUT	+ GW OUT	+ EXPORT	+ CONSUMPTION	
TCB	45000 AF	+ 0	+ 4000 AF	+ 80 AF	+ 0 + 200AF	= 49280 AF
PAN	0	+ 160 ml	+ 340ml	+ 0	+ 0 + 130 ml	= 630 ml

STORAGE

	+ INCR SW STORAGE	+ INCR GW STORAGE		(OUT+INCR STOR)
TCB	+ 0	+ 0	= 0	(49280 AF)
PAN	+ 270 ml	+ 0	= 270 ml	(900 ml)

Budget =

Inflow = Outflow + Change in Storage =

(Rain + Imports) = (Evaporation + Streamflow + Consumption) + (Change in Storage) =

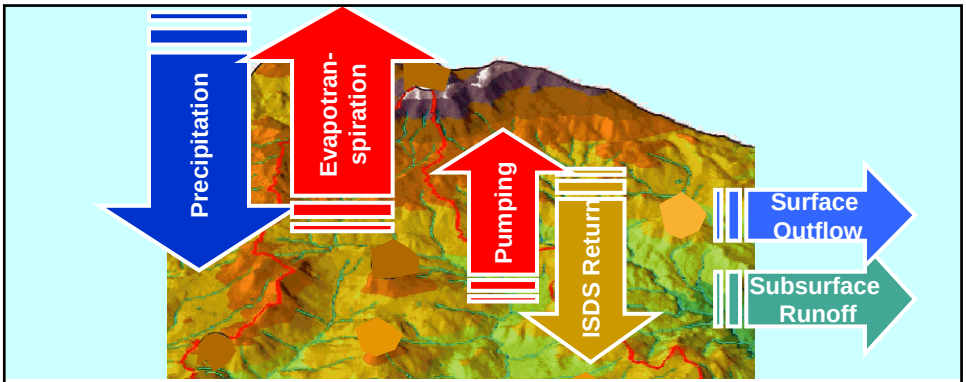
IN		OUT		STORAGE	ERROR
$(0.0005m^3$	$+0.0003m^3)=(0.00016^3$	$+0.00034m^3$	$+0.00013m^3)+(0.00027m^3)$	+	?

ERROR = IN - OUT including STORAGE

ERROR = $(0.0008m^3)$ - $(0.0009m^3)$ = $-0.0001m^3$

% imbalance = 0.0001 / 0.00085 = 12.0% error

Often a budget item is calculated rather than measured so the error is unknown



Budget =

Inflow = Outflow + Change in Storage =

(Precip) = (ET + SrfWaterOut + GrndWaterOut + Consumption) + (Change in Storage) =

IN		OUT		STORAGE	ERROR
(50000AF)	=	(45000AF+4000AF+80AF+200AF)		+ 0	+ ?

ERROR = IN - OUT including STORAGE

ERROR = 50000AF - 49280AF = 720AF

% imbalance = 720 / 49640 = 1.5% error

Note error is larger than some of the components