Example: 11/28/23

$P_c = 200 \text{ psi} \simeq 13800000 \text{ dynes/cm}^2$

$\sigma_{ow} = 25 \text{ dynes/cm}$, $\theta \simeq 0$

$$P_c = \frac{2\sigma\cos\theta}{r}$$

$$\rightarrow r = \frac{2\sigma\cos\theta}{P_c} = \frac{2(25)}{13800000}$$

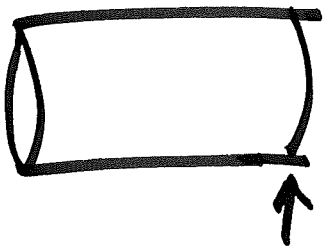
$$\rightarrow r = \underline{\underline{36 \text{ nm}}}$$

speed rad/s	V_w	$S_{w,avg}$	ω (rad/s)	$P_{c,in}$ dynes/cm²	$P_{c,in}$ (psi)	$S_{wav} \cdot P_{c,in}$	$S_{w,in}$
.	.	.					
.	.	.					
.	.	.					
.	.	.					

OR

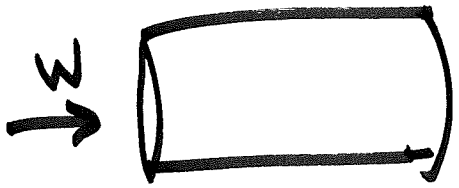
$\frac{dS_{w\,av}}{dP_{c,in}}$	$S_{w,in}$

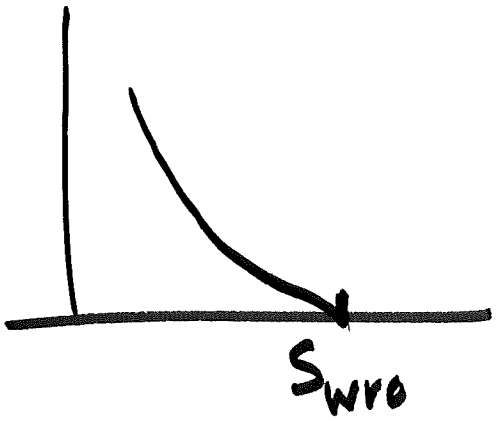
① initial case : S_o, $S_{w,irr}$

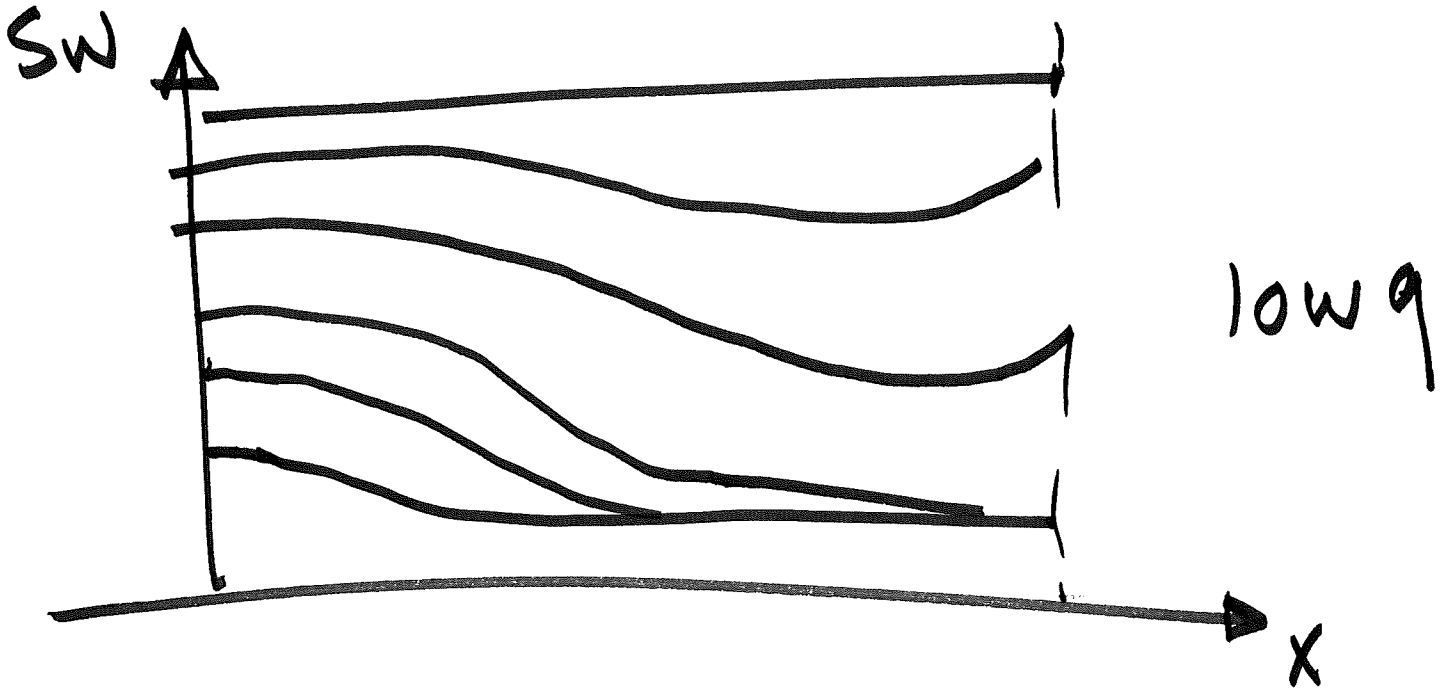


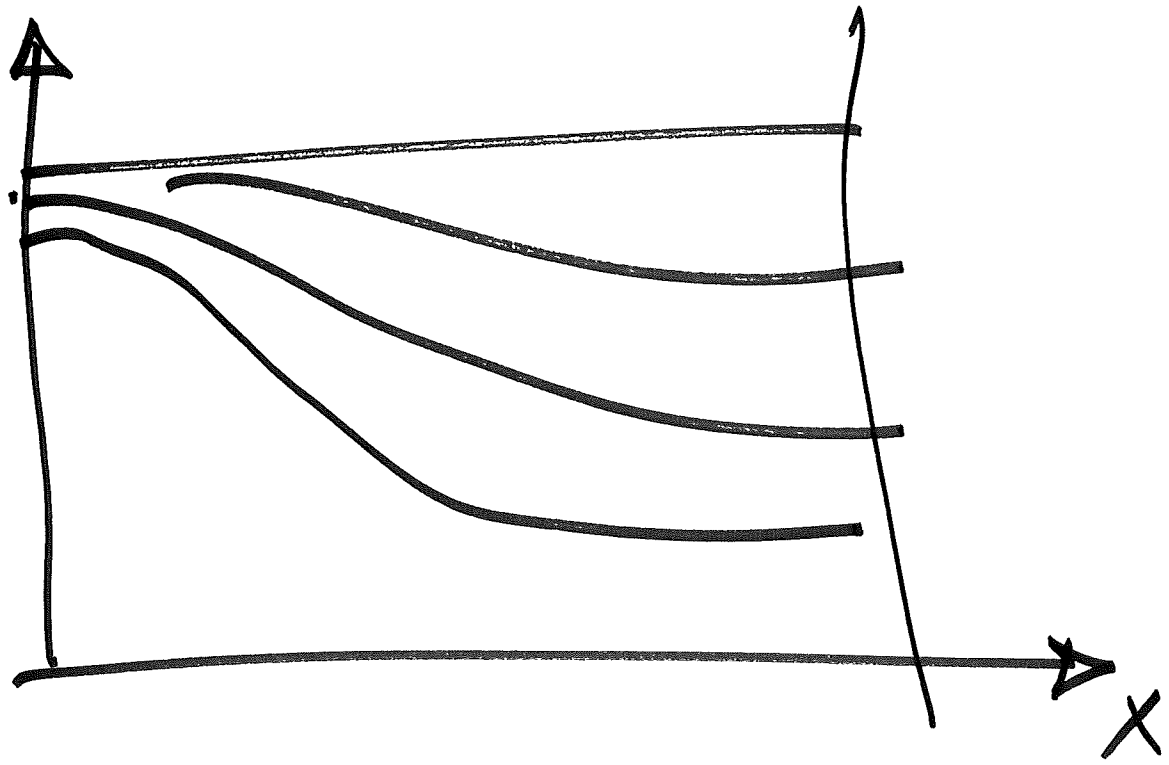
$P_{c,outlet} > P_{c,out}$

$P_{c,out} \downarrow 0$

② 




Sw
low q
x


x

FWL → 8900 ft

$a = 1$

$m = 1.89$

$n = 1.92$

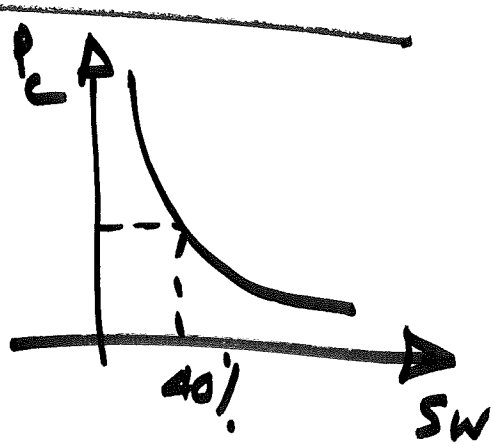
T@ 8800 ft = 250F

$\rho_w = 64$ lb/ft^3 $= 1.025$ g/cm^3

$\rho_{HC} = 22$ lb/ft3 $= 0.35$ g/cm^3

P_c (@ $S_w = 40\%$) = ?

in-situ



$R_w = 0.025$ Ω.m

$$R_t = R_w \frac{a}{\phi^m S_w^n}$$

$$R_t = 0.025 \frac{1}{(0.23)^{1.89} (0.4)^{1.92}}$$

$$\Rightarrow R_t = 2.33 \ \Omega.m$$

$$\rightsquigarrow D = 8700 \text{ ft}$$

$$z = \frac{144 P_c}{\Delta \rho}$$

$$\rightsquigarrow 8900 - 8700 = \frac{144 P_c}{64 - 22}$$

$$\rightarrow \boxed{P_c = 58.3 \text{ psi}}$$

In-situ $\quad \sigma = 50$ dynes/cm , $\theta = 0$

Lab $\quad \sigma = 72$ dynes/cm , $\theta = 0$

$$\frac{(P_c)_1}{\sigma_1 \cos\theta_1} = \frac{(P_c)_2}{\sigma_2 \cos\theta_2}$$

$$\frac{58.3}{50} = \frac{(P_c)_2}{72} \Rightarrow (P_c)_{2\,(\text{lab})} = 83.95 \text{ psi}$$