FORMULA SHEET:

TABLES:

Species	M.W. (g/mol)
Ca	40.0
Mg	24.4
Na	23.0
K	39.0
H	1.0
C	12.0
S	32
O	16
Cl	35.5
N	14.0

Temperature (°C)	Solubility of Oxygen (mg/L)	Temperature (°C)	Solubility of Oxygen (mg/L)
0	14.62	21	8.99
1	14.23	22	8.83
2	13.84	23	8.68
3	13.48	24	8.53
4	13.13	25	8.38
5	12.80	26	8.22
6	12.48	27	8.07
7	12.17	28	7.92
8	11.87	29	7.77
9	11.59	30	7.63
10	11.33		
11	11.08		
12	10.83		
13	10.60		
14	10.37		
15	10.15		
16	9.95		
17	9.74		
18	9.54		
19	9.35		
20	9.17		

CONSTANTS**:**

Temp correction coefficient (θ) = 1.135 for final temperatures between 4 and 20°C

Temp correction coefficient (θ) = 1.056 for final temperatures between 20 and 25°C

EQUATIONS:

$k_T = k_{20}\theta^{(T-20)}$

Rate of deoxygenation = $k_d L_t$

$k_d = k + \eta(u/h)$

Rate of reaeration = $k_r D$

$k_r = 3.9u^{1/2}/H^{3/2}$

$Q = KA(dh/dL)$

$R = 1 + (\rho_b/\eta)K_s$

$K_s = 6.3 \times 10^{-7} f_{oc} K_{ow}$

$$\text{width of capture zone at well} = \frac{Q}{2qB}$$

$$\text{maximum width of capture zone} = \frac{Q}{qB}$$

$$L_t = L_o.e^{-kt}$$

$$BOD_t = L_o(1-e^{-kt})$$

$$D = \frac{k_d L_o}{k_r - k_d}(e^{-k_d t} - e^{-k_r t}) + D_0(e^{-k_r t})$$

$$t_c = \frac{1}{k_r - k_d}\ln\left[\frac{k_r}{k_d}(1 - D_0\frac{k_r - k_d}{k_d L_0})\right]$$

$$Y = \frac{Q}{2qB}(1-\frac{\phi}{\pi})$$

$$BOD_t = \frac{(DO_{s,i} - DO_{s,t})}{P}$$