

Appendix D

CONVERSIONS AND FORMULAS

1 Cubic foot (ft ³)	=	7.5 gallons
1 cubic foot of water	=	62.4 pounds
1 gallon of water	=	8.34 pounds
1 pound per square inch (psi)	=	2.31 feet of water (head)
1 foot of water (head)	=	.434 pounds per square inch (psi)
1 grain per gallon	=	17.1 parts per million (ppm)
1 part per million (ppm)	=	1 milligram per liter (mg/l)
1 pound (1 lb.)	=	454 grams
1 foot	=	12 inches
1 yard	=	3 feet
1 meter	=	3.281 feet
1 liter	=	0.264 gallons
1 gallon	=	3.785 liters

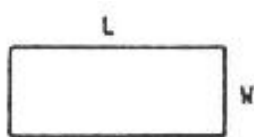
Continuity Equation $Q=A \times V$ where	Q	=	rate of flow (ft ³ /sec)
	A	=	cross-sectional area (ft ²)
	V	=	velocity (ft/sec)

Detention Time $T=V/Q$ where	T	=	detention time (sec)
	V	=	volume (ft ³)
	Q	=	rate of flow (ft ³ /sec)

$$\text{Pounds of pure chemical} = \text{ppm} \times \frac{(\text{gallons treated})}{1,000,000} \times 8.34$$

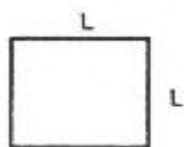
CIRCUMFERENCE AND AREA

Rectangle



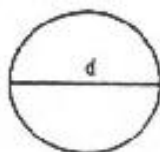
$$\begin{aligned} \text{Circumference} &= (2 \times L) + (2 \times W) \\ \text{Area} &= L \times W \end{aligned}$$

Square



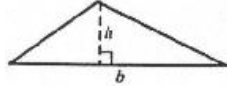
$$\begin{aligned} \text{Circumference} &= 4 \times L \\ \text{Area} &= L \times L \end{aligned}$$

Circle



$$\begin{aligned} \text{Circumference} &= \pi \times d \\ \text{Area} &= \pi \times r^2 \text{ or } 0.785 \times d^2 \\ \pi &= 3.14 \\ r &= d/2 \end{aligned}$$

Triangle



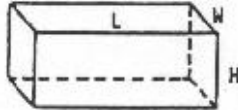
$$A = \frac{B \times H}{2}$$

B = length of base

H = height of base to tip of angle

VOLUMES AND SURFACE AREA

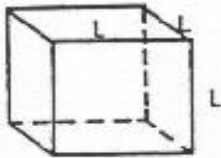
Rectangular Solid



$$\text{Volume} = H \times L \times W$$

$$\text{Surface Area} = 2 \times (L \times H) + 2 \times (H \times W) + 2 \times (L \times W)$$

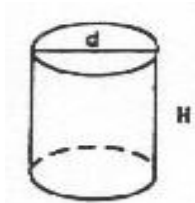
Cube



$$\text{Volume} = L \times L \times L$$

$$\text{Surface Area} = 6 \times L \times L$$

Cylinder



$$\text{Volume} = \text{Area} \times \text{height or } \pi \times r^2 \times H \text{ or } 0.785 \times d^2 \times H$$

$$\text{Surface Area} = \text{top} + \text{bottom} + \text{side} = 2 \times (\pi \times r^2)$$

$$+ \pi \times d \times H$$

$$\pi = 3.14$$

$$r = d/2$$

Sphere



$$\text{Volume} = 4/3 \times \pi \times r^3$$

$$\text{Surface Area} = 4 \times \pi \times r^2$$

$$\pi = 3.14$$

$$r = d/2$$

Cone



$$\text{Volume} = \pi/3 \times r^2 \times H$$

$$\pi = 3.14$$

$$r = d/2$$