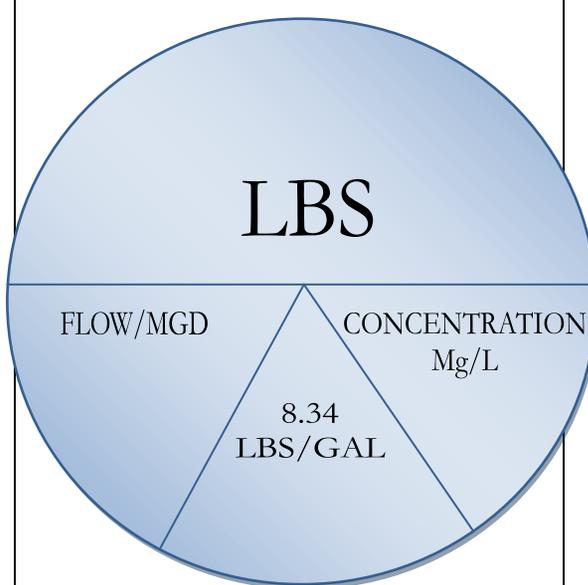


# COLLECTION SYSTEM CONVERSION FACTORS AND FORMULAS

CONVERSIONS	FLOW AND VELOCITY	PIE CHART FORMULAS
<p>1 psi = 2.31 ft. of head                      1 ft. of head = .433 psi                      1 cu.ft of water = 7.48 gallons                      1 cu.ft of water = 62.4 lbs.                      1 cu.yrd = 27 cu.ft                      1 gallon = 8.34 lbs.                      1 gallon = 3,785 ml                      1 Liter = 1,000 ml                      1 Liter = 1,000 grams                      1 mg/L = 8.34 lbs/MG                      1 ppm = 1 mg/L                      1 ml = 1 gram                      1 pound = 453.6 grams                      1 pound = 7,000 grains                      1 kilogram = 1,000 grams                      1 cu.ft/sec = 448.8 gpm                      1 MGD = 1.55 cu.ft/sec                      1 MGD = 694.5 gpm                      1 HP = 33,000 ft.lbs./min                      1 HP = .746 kilowatt                      1 mile = 5,280 feet</p>	<p>"Q" = FLOW expressed in cubic ft per sec. (cfs)                      "V" = VELOCITY expressed in ft per sec. (fps)                      "A" = AREA expressed in square ft (sqft)    <math>Q = A \times V</math>    <math>V = Q \div A</math>    <math>A = Q \div V</math></p>	<p>Mg/L = <math>\frac{\text{lbs}}{\text{Flow MGD} \times 8.34}</math>                        Pounds = Flow, MGD x Concentration, mg/l x 8.34</p>
		<h3 style="margin: 0;">BASIC FORMULAS</h3>
		<p><b>Slope</b> = <math>\frac{\text{Fall in Feet}}{\text{Length in Feet}} \times 100</math>    <b>Grade</b> = <math>\frac{\text{Rise in Feet}}{\text{Run in Feet}}</math>    <b>Velocity</b> = <math>\frac{\text{Distance Traveled in Feet}}{\text{Time Required in Seconds}}</math>    <b>Elevation</b> = % Grade x Pipe Run in Feet</p> <p><b>Pump Rate/GPM</b> = <math>\frac{\text{Influent Rate} - \text{Rise}}{\text{Rate with Pump Running}}</math>    <b>Pump Rate/GPM</b> = Volume ÷ Time</p> <p><b>Percent Flow</b> = Actual Flow ÷ Average Flow</p> <p><b>Detention Time</b> = Volume (gals) ÷ Flow (gpm)</p> <p><b>Kilowatts</b> = Horsepower x 0.746</p> <p><b>Kilowatt Hours</b> = Kilowatts Used x Hrs Operated</p> <p><b>Power Cost</b> = Kilowatt Hrs Used x Cost/Kilowatt</p> <p><b>Total Residual Chlorine</b> = Dosage – Chlorine Demand</p> <p><b>Volume of Chemical Added</b> = <math>\frac{\text{Final Volume} \times \text{Final Concentration}}{\text{Concentration of Chemical Added}}</math>    <b>Time for 100% Settling</b> = Depth ÷ Settling Rate</p> <p><b>Tank Length Required</b> = Velocity x Time for 100% Settling</p>
OBJECT	AREA (ft <sup>2</sup> )	VOLUME (ft <sup>3</sup> )
Rectangle	Length' x Width'	Length' x Width' x Height'
Circle	.785 x D' x D'	
Triangle	1/2 (Base' x Altitude')	
Cylinder		.785 x D' x D' x Length'
Sphere		.5236 x D' x D' x D'
<p><b>Perimeter = Sum of All Sides</b>  <b>Diameter (D) = 2 x radius</b>  <b>Circumference = π (3.14) x D</b></p>		