WATER CONVERSIONS

A Guide To Water Measurements

FOR DUMMIES

Water Conversion Units

1 Cubic Foot = 7.4805 Gallons = 28.32 Liters

1 Cubic Foot = 62.47 Pounds

1 Cubic Meter = 35.31 Cubic Feet = 264.2 Gallons

1 Acre-Foot = 325,851 Gallons

1 Million Gallons = 3.07 Acre-Feet

1 Acre-Foot = 43,560 Cubic Feet

1 Acre of Land = 43,560 Square Feet

Water Flow Conversion Units

1 Cubic Foot per Second (cfs) = 448.83 Gallons per Minute (gpm)

1 Cubic Foot per Second (cfs) = 646,320 Gallons per Day*

1,000 GPM = 2.23 CFS = 4.42 Acre-Feet per Day

1 cfs = 1.983 Acre-Feet per Day = 59.5 Acre-Feet per Month (30 Days)

1 cfs = 28.32 Liters per Second = 1700 Liters per Minute

1 cfs for 30 Days = 59.5 Acre-Feet = 7.34 Hectare-Meters

1 cfs for 1 Year = 724 Acre-Feet = 89.3 Hectare-Meters

1 Miners Inch = 11.22 GPM in Arizona

40 Miners Inches = 1 cfs or 450 gpm (rounded for conversion)

Land Measurement Units

1 Mile = 5280 Feet = 320 Rods = 1760 Yards = 80 Chains

1 Chain = 66 Feet

1 Acre = 43,560 Square Feet

1 Acre = 0.4047 Hectare

1 Hectare = 1,000 Square Meters = 2.47 Acres

1 Rod = 16.5 Feet

Conversion Calculations

1 cfs = one (1) Acre-Inch per Hour
1 cfs = one (1) Acre-Foot in 12 Hours
1 cfs = two (2) Acre-Feet in 24 Hours

$$\text{CFS to Acre-Feet} = \frac{\text{cfs x Hours of Flow}}{12}$$

$$\text{Miner's Inches to Acre-Feet} = \frac{\text{Miner's Inches x Hours of Flow}}{40}$$

$$\text{Miner's Inches to CFS} = \frac{\text{Miner's Inches}}{40}$$

$$\text{Gallons per Minute to CFS} = \frac{\text{1ill.!'.ll}}{450}$$

Formulas for On-Farm Irrigation Calculations

The Basic Formula: Q x t = d x A

Where: Q = Flow Rate in cfs
        t = Time of Flow in Hours
        d = Depth of Irrigation Application in Inches
        A = Acres Covered

Hence: $t \text{ (time)} = \dfrac{d \times A}{Q}$ $Q \text{ (CFS)} = \dfrac{d \times A}{t}$

$D \text{ (Depth)} = \dfrac{!.1LQ}{A}$ $A \text{ (Acres)} = \dfrac{t \times Q}{A}$

Calculating Volume of Water in Containers

1. For Rectangular Shaped Containers:

Gallons= Area in Cubic Feet x 7.4805 (Gallons per Cubic Foot} or

Gallons= Length (in inches} x Width (in inches} x Height (in inches) x 7.4805

2. For Round Containers (cylinders):

Gallons= Pi (re} x Radius 11 2 (in feet} x Height (in feet} x 7.4805

re= 3.1428˙

Standard Energy Definitions, Facts, and Conversions

Water Horsepower (whp} - a measure of power, often associated with pumps, which is a function of pressure and flow capacity (i.e. water flow in gallons per unit of time).

1 whp = 550.3 foot pound-force per second

1 megawatt = 1340.4053 horsepower (water}

1 megawatt= 1,000 kilowatts= 1,000,000 watts

1 whp = 745.7 watts= .0007457 megawatts

Every month the United States on average consumes:

877 kilowatts = .877 megawatts of electricity per household which is equivalent to 1176 whp = 647,152.8 foot pound-force per second.