# CONVERSIONS AND EQUATIONS

## Measurement Units

GPM = gallons per minute
GPD = gallons per day
CFS = cubic feet per second
AF = acre-feet
AFA = acre-feet per year (or per annum)
AFD = acre-feet per day
MGD = million gallons per day

## Conversions

1 acre-foot = 325,851 gallons
1 acre = 43,560 square feet
1 $ft^3$ = 7.48 gallons
$C = 2\pi r$
$\pi = 3.14$

## Conversion Table

| 5,000 GPD= | 30,000 GPD= | 100,000 GPD= | 500,000 GPD= |
|---|---|---|---|
| 0.01 CFS | 0.05 CFS | 0.2 CFS | 0.8 CFS |
| 3.47 GPM | 20.83 GPM | 69.4 GPM | 347.2 GPM |
| 5.60 AFA | 33.60 AFA | 112.0 AFA | 560.1 AFA |
| 0.02 AFD | 0.09 AFD | 0.3 AFD | 1.5 AFD |
| 0.01 MGD | 0.03 MGD | 0.1 MGD | 0.5 MGD |

## Definitions (measured in feet)

L = length
W = width
D = depth
C = circumference
d = diameter
h = height
b = base

## Containments (equations to obtain capacities in gallons)

| | |
|---|---|
| oval/ellipse | $\pi \times [(L \times W)/4] \times D \times 7.48$ |
| square/rectangle | $L \times W \times D \times 7.48$ |
| circle/cylinder | $\pi \times (d^2/4) \times D \times 7.48$ |
| ½circle/½cylinder | $\pi \times (d^2/8) \times D \times 7.48$ |
| triangle | $\frac{1}{2}(b \times h) \times D \times 7.48$ |

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Impoundments [equations to calculate surface area (acres) and capacity (acre-feet)]; a factor of 0.4 is used to account for irregular reservoir bottom

| | |
|---|---|
| oval/ellipse | $[\pi \times (L \times W)/4]/43{,}560$ = surface area<br>area x 0.4 x D = capacity |
| square/rectangle | $(L \times W)/43{,}560$ = surface area<br>area x 0.4 x D = capacity (for reservoirs) |
| circle | $(\pi \times d^2/4)/43{,}560$ = surface area<br>area x 0.4 x D = capacity |
| triangle | $\frac{1}{2}(b \times h)/43{,}560$ = surface area<br>area x 0.4 x D = capacity |