FILTRATION

Filtration Rate (GPM/sq.ft) = $\frac{\text{Filter Production (gallons per day)}}{\text{(Filter area sq. ft.) x (1,440 min/day)}}$ sq. ft. = square feet

Filtration Rate (GPM) = $\frac{\text{(Filter Area, sq. ft.) x (GPM/ sq. ft.)}}{\text{Loading Rate}}$

Loading Rate (GPM/ sq. ft.) = $\frac{\text{(Flow Rate, GPM)}}{\text{(Filter Area, sq. ft.)}}$

Daily Filter Production (GPD) = (Filter Area, sq. ft.) x (GPM/ sq. ft. x 1,440 min/day)

Backwash Pumping Rate (GPM) = (Filter Area, sq. ft.) x (Backwash Rate, GPM/ sq. ft.)

Backwash Volume (Gallons) = (Filter Area, sq. ft.) x (Backwash Rate, gpm/ sq. ft.) x (Time, min).

Backwash Rate, GPM/ sq. ft. = $\frac{\text{(Backwash Volume, gallons)}}{\text{(Filter Area, sq. ft.) x (Time, min)}}$

Rate of Rise (inches per min.) = $\frac{\text{(backwash rate gpm/sq.ft.) x 12 inches /ft}}{\text{7.48 gal/cu.ft.}}$

C• T CALCULATIONS

C• t = (Chlorine Residual, mg/L)x(Time, minutes)

Time, minutes = $\frac{\text{(C• t)}}{\text{(Chlorine Residual, mg/L)}}$

Chlorine Residual (mg/L) = $\frac{\text{(C• t)}}{\text{(Time, minutes)}}$

Inactivation Ratio = $\frac{\text{(Actual System C• t)}}{\text{(Table "E" C• t)}}$

C• t Calculated = T_{10} Value, minutes x Chlorine Residual, mg/L

Log Removal = 1.0 - $\frac{\text{\% Removal}}{100}$ x Log key x (-1)

SEDIMENTATION

Surface Loading Rate, (GPD/ sq. ft.) = $\frac{\text{(Total Flow, GPD)}}{\text{(Surface Area, sq.ft.)}}$

Detention Time = $\frac{\text{Volume}}{\text{flow}}$

Flow = $\frac{\text{Volume}}{\text{Time}}$

Weir Overflow Rate, GPD/L.F. = $\frac{\text{(Flow, GPD)}}{\text{(Weir length, ft.)}}$

Chemical Dosage Calculations

Note (% purity) and (% commercial purity) used in decimal form

Lbs/day gas feed dry = MGD x 8.34 lbs/gal x (ppm or mg/L)

Lbs/day = $\frac{\text{MGD x 8.34 lbs/gal x (ppm or mg/l)}}{\text{\% purity}}$

GPD = $\frac{\text{(MGD) x (8.34 lbs/gal) x (ppm or mg/l)}}{\text{(\% purity) x lbs/gal}}$

GPD = $\frac{\text{MGD x 8.34 lbs/gal x (ppm or mg/l)}}{\text{(commercial purity \%) x (ion purity \%) x (lbs/gal)}}$

ppm or mg/l = $\frac{\text{lbs/day}}{\text{MGD x 8.34 lbs/gal}}$ or $\frac{\text{gallons x \% purity x lbs/gal}}{\text{MG x 8.34 lbs/gal}}$