**Calculating Sludge Volume Index (SVI)**

Info Needed:

30 Min Settleability Test result, ml

MLSS, mg/L

Formula:

(30 Min Sett Result ÷ MLSS, mg/L) x 1000

Practice:

MLSS = 3,800 mg/L

30 Min Reading = 425

**Calculating Solids Inventory, lbs.**

Info Needed:

Aeration Tank Capacity, in million gallon units (MG)

MLSS, mg/L

Formula:

Tank capacity, MG x MLSS, mg/L x 8.34 lbs/gal

Practice:

Aeration Tank info: 2 Tanks

Each tank contains 145,000 Gallons

MLSS = 3,250 mg/L

**Calculating MLVSS, mg/L**

Info Needed:

Aeration Tank MLSS, mg/L

Percent of Volatile Solids in MLSS, %

Formula:

1. Convert % Volatile Solids to decimal form

 Ex: 78% = 0.78

 91% = 0.91

1. Multiply MLSS by Volatile Solids as decimal

 Ex: 3,200 mg/L x 0.78 = 2,496 mg/L MLVSS

Practice:

MLSS = 5,000 mg/L VSS % = 72%

MLSS = 2,200 mg/L VSS % = 81%

MLSS = 3,555 mg/L VSS % = 78%

Inf. TSS = 256 mg/L VSS % = 93%

**Calculating Food to Microorganism Ratio (F/M)**

Info Needed:

Influent Flow Rate, MGD

Influent BOD or CBOD, mg/L

Aeration Tank Capacity, MG

Aeration Tank MLVSS, mg/L

Info Needed: Note: You will do 2 Pounds formulas first.

1. lbs. of INF BOD per day:

 Inf. Flow, MGD x Inf. BOD (or CBOD), mg/L x 8.34 lbs/gal

1. lbs. of Aeration Tank MLVSS:

 Aeration Tank Capacity, MG x MLVSS, mg/L x 8.34 lbs/gal

Formula: A ÷ B or Inf CBOD, lbs./day

 MLVSS, lbs.

Practice:

Inf Flow = 15 MGD

Inf CBOD = 230 mg/L

Aeration Cap = 20.5 MG

Aeration MLVSS = 2280 mg/L

**Calculating Mean Cell Residence Time, MCRT**

Info Needed:

Aeration Tank Capacity, MG

Aeration Tank MLSS, mg/L

INF. (or plant) Flow, MGD

EFF. TSS, mg/L

Waste (or Return) Sludge SS, mg/L

Waste flow rate, MGD

Formula: Note: You will do 3 pounds formulas first.

1. Solids inventory, lbs:

 Aeration Cap., MG x Aeration MLSS, mg/L x 8.34 lbs/gal

1. Solids lost in EFF, lbs/Day:

 Plant Flow, MGD x EFF TSS, mg/L x 8.34 lbs/gal

1. lbs wasted to digester per day:

 Waste (or return) Sludge, mg/L x Waste Flow, MGD x 8.34 lbs/gal

Formula:

A ÷ (B+C) or lbs. Solids Inventory

Eff lbs/day + Waste lbs/day

Practice:

Aeration Cap. = 6.5 MG Eff. TSS = 27 mg/L

Aeration MLSS = 2,500 mg/L Waste SS = 5,000 mg/L

Plant Flow = 4.2 MGD Waste Flow= 150,000 GPD