



Operational Wastewater Math- Part 4

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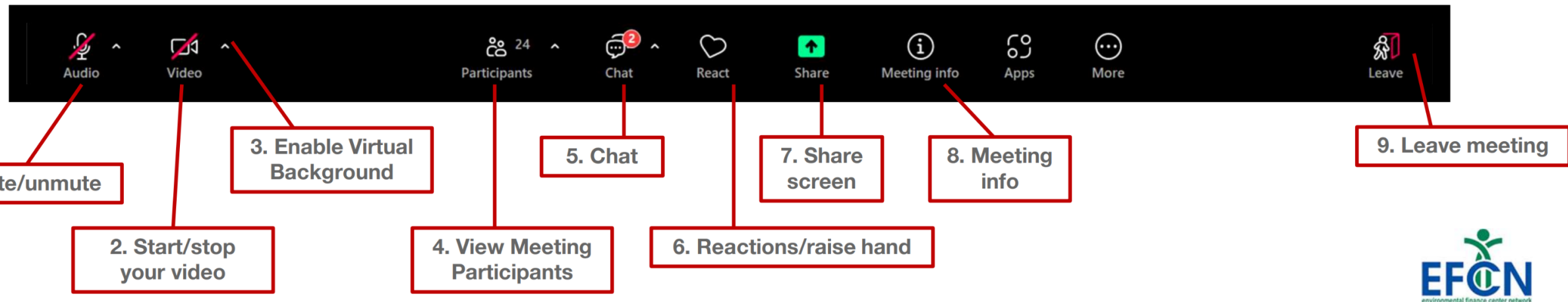
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This training series is funded by the EPA

Attendee Meeting Controls

- Locate your control bar
- All attendees will see a black horizontal bar on their screen
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Q Search ...

Standardized Wastewater Treatment Operator Exams

Wastewater Treatment Operator Need-to-Know Criteria

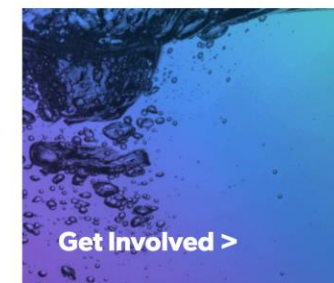
Need-to-Know Criteria outline the content that will be covered on WPI's standardized examinations provided through [ABC Testing](#), a WPI service.

- [Wastewater Treatment Operator Class I](#)
- [Wastewater Treatment Operator Class II](#)
- [Wastewater Treatment Operator Class III](#)
- [Wastewater Treatment Operator Class IV](#)

Wastewater Treatment Operator Formula/Conversion Table

WPI standardized exams are administered with a Formula/Conversion Table containing mathematical formulas and common abbreviations that may be present on the exam.

- [Wastewater Treatment Operator Formula/Conversion Table](#)



Volume 1, Eighth Edition



OPERATION OF
WASTEWATER
TREATMENT PLANTS

Volume 2, Eighth Edition

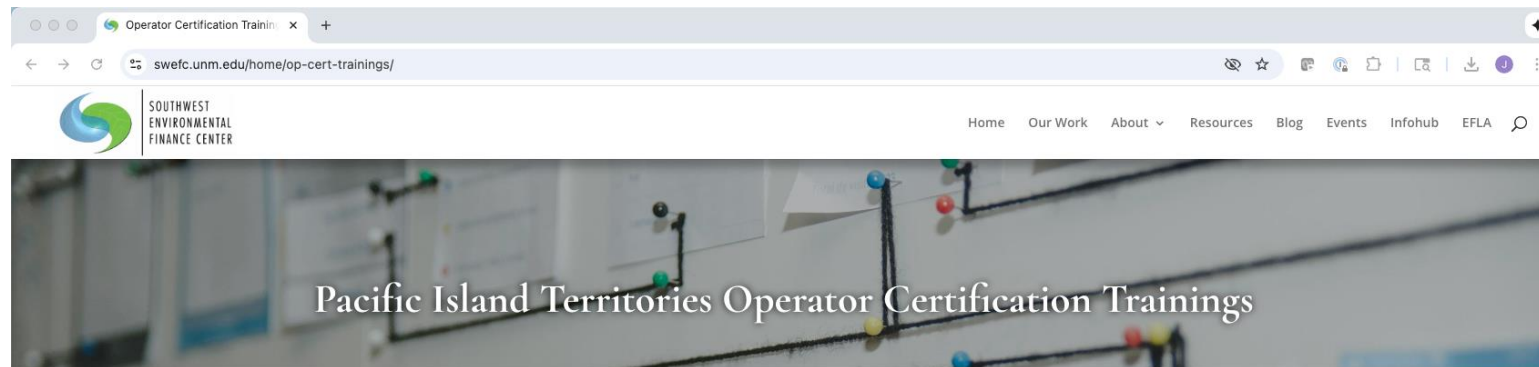


OPERATION OF
WASTEWATER
TREATMENT PLANTS



Date	Topic
1/20/26	Concept and Math Review Session
2/3/26	Disinfection Part 1 (chlorination/dechlorination) + related math
2/17/26	Disinfection Part 2 - UV and other methods
3/3/26	WW Math Part 3 (Flow, Detention Time)
3/17/26	WW Math Part 4 (BOD Math /Advanced WW Math)
3/31/26	Solids Handling Part 1 (Mechanical Solids Separation)
4/14/26	Solids Handling Part 2 (Solids Handling)
4/28/26	Sampling
5/12/26	Regulations (NPDES Permits and Discharge Limitations)
5/26/26	Treatment System Maintenance
6/9/26	Lab Procedures/Analysis/Interpretation or alternate topic
6/23/26	Using Technology in daily operations (SCADA, Computer, Tablets, CMMS, AI, etc.)
7/7/26	Course Review Session - Short sample exam?

https://swefc.unm.edu/home/op-cert-trainings/



This page is a repository of Wastewater and Drinking Water Operator Certification (Op Cert) Training Webinars offered by the SW EFC for systems in the Pacific Territories. Below you will find the **training webinar schedules (wastewater, then drinking water)** followed by a **training webinar recordings library**.

[Jump to Wastewater Trainings](#)

[Jump to Drinking Water Trainings](#)

Wastewater Training Schedule

Please note all times are local to CNMI and Guam. The times in American Samoa are one day earlier at 11 am.

Session	Date	Training Topic & Link to Recording (click to view)	Supporting Materials (click to download)
1	6/25/2025	Program Overview, Test Format, Study & Test Tips	PPT slides
2	7/9/2025	Treatment Overview	PPT slides
3	7/23/2025	WW Math Part 1 (Areas & Volumes)	PPT slides
4	8/6/2025	WW Math Part 2 (Flow Rates & Detention Times)	PPT slides
5	8/20/2025	Collection Systems – Gravity systems	PPT Slides
6	9/3/2025	Collection Systems – Pumping & Force Mains	PPT Slides
			Collection Systems (Grades 1 – 2) Course #401
			Tech Brief – Reading Centrifugal Pump Curves
			Grundfos E-cademy – Pump Selection Basics
7	9/17/2025	Collection System Maintenance	Pennsylvania Department of Environmental Protection Module 9: Basics of Pumps and Hydraulics
8	10/1/2025	Operator Safety/OSHA/Chemical Safety & Inventory	PPT Slides
9	10/15/2025	Preliminary Treatment	PPT Slides
10	10/29/2025	Primary Treatment: Sedimentation	

Sign in for every session to ensure you get credit for attending



US Territories Water & Wastewater Operator Certification
Virtual Training Series Group Attendance Sheet

Session Title: _____
Session Date: _____
Training Location: _____

Attendee Name	Attendee Signature	Arrival Time	Departure Time

I hereby certify that the individuals listed above attended the referenced training session.

Name: _____
Signature: _____
Title: _____
Date: _____

BOD

Biochemical Oxygen Demand (BOD)

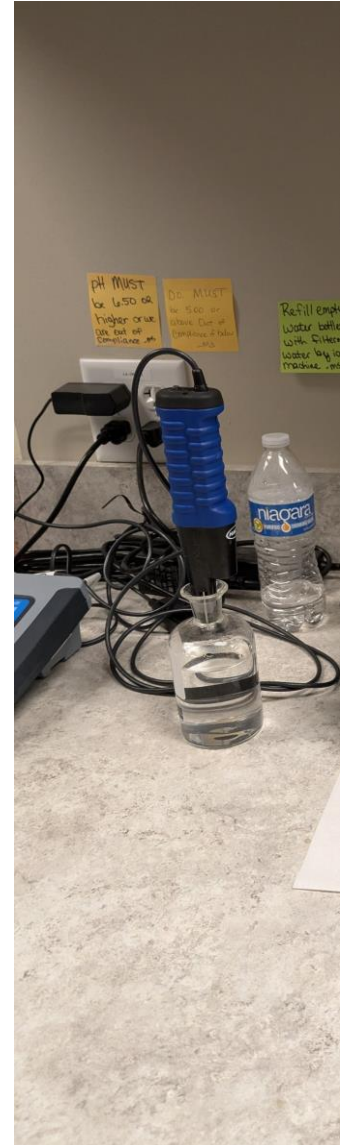
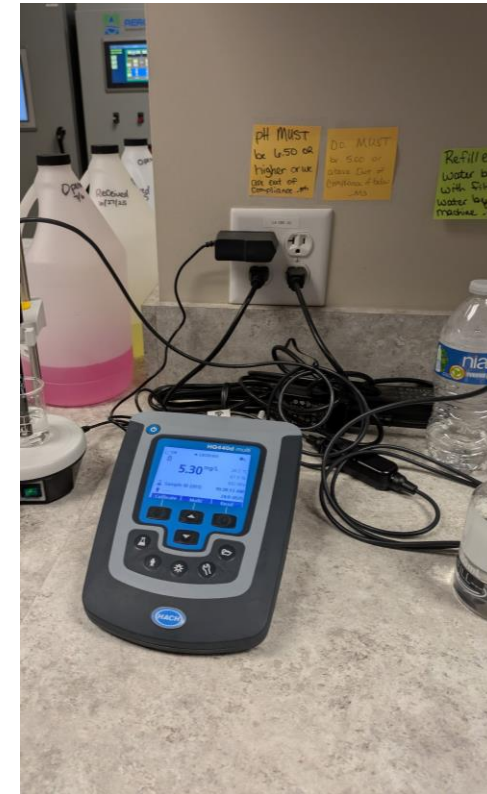
Analytical measure of the organic strength of wastewater

Amount of dissolved oxygen (DO) consumed by microbes

- Expressed as BOD_5 (mg/L)
- Incubated for 5-days at 20°C

BOD used to evaluate wastewater treatment plant (WWTP) processes

- BOD indicates process efficiency
- BOD indicates the impact of WWTP discharge on the environment
- NPDES parameter



Loading Rate

The rate at which chemicals are added to wastewater or discharged in effluent

- Measured in lbs/day or kg/day
- Referred to as feed rate as well

Chemical loading rate (lbs/day) = flow (MGD) × dosage (mg/L) × 8.34 (lbs/gal)

$$\text{BOD Loading} \frac{\text{lbs}}{\text{day}} = \text{---MGD} \times \text{---} \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lbs}}{\text{gal}}$$

Chlorine feed rate (lbs/day) = flow (MGD) × dosage (mg/L) × 8.34 (lbs/gal)

mg/L=ppm

BOD Units

BOD is measured in mg/L

$$1 \frac{\text{mg}}{\text{L}} = 1 \text{ ppm} = \frac{1}{1,000,000}$$

$$1 \text{ kg H}_2\text{O} = 1 \text{ L}$$

=ppm=1mg/L

$$\frac{\cancel{\text{mg}}}{\cancel{\text{L}}} \times \frac{\cancel{\text{kg}}}{1,000,000 \cancel{\text{mg}}} \rightarrow \frac{1}{1,000,000}$$

$$\text{BOD Loading} \frac{\text{lbs}}{\text{day}} = \text{--- MGD} \times \text{---} \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lbs}}{\text{gal}}$$

Unit Values	1,000,000 gal	1	8.34 lbs	$\rightarrow \frac{\text{lbs}}{\text{day}}$
1	day	1,000,000	gal	

BOD Loading Example

Samples were taken at the influent of a WWTP and a BOD₅ test was performed. The average influent of the WWTP is 1 MGD and the sample analysis determined that the BOD concentration for that day was 240 mg/L. Calculated the BOD loading to this WWTP.

$$\text{BOD Loading} \frac{\text{lbs}}{\text{day}} = \text{---MGD} \times \text{---} \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lbs}}{\text{gal}}$$

$$\frac{1 \cancel{\text{MG}}}{\text{day}} \times \frac{240 \cancel{\text{mg/L}}}{1} \times \frac{8.34 \cancel{\text{lbs}}}{\cancel{\text{gal}}} = 2001.6 \frac{\text{lbs}}{\text{day}}$$

BOD Loading Practice

You work at a WWTP with a primary clarifier and a trickling filter and want to determine the current organic loading to your process, but first you need to calculate the BOD loading to the trickling filter. You collect a sample of the primary effluent and determine the average BOD is 129 mg/L. The flow to the trickling filter is 0.04 MGD. What is the average BOD loading to the trickling filter in lbs/day?

$$\text{BOD Loading} \frac{\text{lbs}}{\text{day}} = \text{---MGD} \times \text{---} \frac{\text{mg}}{\text{L}} \times 8.34 \frac{\text{lbs}}{\text{gal}}$$

$$\frac{.04 \cancel{\text{MG}}}{\text{day}} \times \frac{129 \cancel{\text{mg/L}}}{1} \times 8.34 \frac{\text{lbs}}{\cancel{\text{gal}}} = 43.03 \frac{\text{lbs}}{\text{day}}$$

Organic Loading Rate

Measured the amount of organic material (expressed in BOD) applied to a treatment system per unit of media (volume or surface area) per day

- Used as a design parameter to ensure regulatory compliance
- Performance monitoring indicator
- Applies to: Trickling Filter

RBCs

Lagoons

- Expressed in lbs BOD/1,000 ft³/day and kg BOD/m³/day
- Expressed in lbs BOD/1,000 ft²/day and kg BOD/m²/day

Organic Loading Rate Equations

Rotating Biological Contactors

$$\text{Organic Loading Rate} - \text{RBC, lb SBOD}_5/\text{day}/1,000 \text{ ft}^2 = \frac{\text{Organic Load, lb SBOD}_5/\text{day}}{\text{Media Surface Area, 1,000 ft}^2}$$

$$\text{Organic Loading Rate} - \text{RBC, kg SBOD}_5/\text{m}^2 \text{ days} = \frac{\text{Organic Load, kg SBOD}_5/\text{day}}{\text{Media Surface Area, m}^2}$$

Trickling Filters

$$\text{Organic Loading Rate} - \text{Trickling Filter, lb SBOD}_5/\text{day}/1,000 \text{ ft}^3 = \frac{\text{Organic Load, lb BOD}_5/\text{day}}{\text{Media Volume, 1,000 ft}^3}$$

$$\text{Organic Loading Rate} - \text{Trickling Filter, kg BOD}/\text{m}^3 \text{ days} = \frac{\text{Organic Load, kg BOD}_5/\text{day}}{\text{Media Volume, m}^3}$$

Process Control Calculations

F:M Ratio

Represents the ratio of organic material (food) to the amount of microorganisms in a bioreactor

- BOD concentration represents the food
- MLVSS concentration represents the microorganisms

Monitoring the F:M ratio is essential to ensure that bioreactors are treating wastewater correctly and permit requirements are met

- Low F:M ratios limit microbial populations and decrease wastewater treatment
- High F:M ratios lead to excessive sludge production
- The F:M ratio inversely correlates with the SRT/MCRT

F:M Ratio Equation

$$\frac{F}{M} = \frac{\text{total rate of applied food}}{\text{total microbe biomass}} = \frac{Q \times \text{BOD}}{V_{ab} \times \text{MLVSS}} = \left[\frac{\text{lb BOD}}{\text{lb VSS} \cdot \text{day}} \right]$$

- Q = Flow Rate into aeration Tank
- BOD = concentration of BOD in the flow into Aeration Tank
- V_{ab} = volume of Aeration Tank
- MLSS = concentration of suspended solids in the Aeration Tank
- MLVSS (or VSS) = concentration of MLVSS in the Aeration Tank

Units are $\frac{\text{food mass}}{\text{microbe mass} \times \text{day}}$ (lb BOD/lb VSS/day or kg BOD/kg VSS/day)

- Units sometimes represents as just per day

Ideal F:M ratio is 0.2-0.6 lb BOD/lb VSS/day

F/M Ratio Units

$$\frac{F}{M} = \frac{\text{total rate of applied food}}{\text{total microbe biomass}} = \frac{Q \times \text{BOD}}{V_{ab} \times \text{MLVSS}} = \left[\frac{\text{lb BOD}}{\text{lb VSS} \cdot \text{day}} \right]$$

$$\frac{F}{M} = \frac{Q \left[\frac{\text{Mgal}}{\text{day}} \right] \times \text{BOD} \left[\frac{\text{mg}}{\text{L}} \right] \times \frac{8.34 \text{ lb} \cdot \text{L}}{\text{mg} \cdot \text{Mgal}}}{V_{ab} \left[\text{Mgal} \right] \times \text{MLVSS} \left[\frac{\text{mg}}{\text{L}} \right] \times \frac{8.34 \text{ lb} \cdot \text{L}}{\text{mg} \cdot \text{Mgal}}} = \frac{\text{lb BOD}}{\text{lb VSS} \cdot \text{day}}$$

$$\frac{F}{M} = \frac{\text{BOD Loading} \left(\frac{\text{lbs}}{\text{day}} \right)}{\text{VSS in the system (lbs)}} = \frac{\text{lb BOD}}{\text{lb VSS} \cdot \text{day}}$$

F:M Ratio Example

A small wastewater treatment plant has the following data:

BOD = 260 mg/L

Biomass = 75% of solids

Tank Volume (V_{ab}) = 84,000 gal

Flow (Q) = 136,000 gpd

MLSS = 1,900 mg/L

What is the F:M ratio for this plant?

$$F:M = \frac{\text{lb BOD}}{\text{lb VSS} \cdot \text{day}}$$

1) Calculate MLVSS: $MLVSS = 75\% \times MLSS \text{ concentration} = 75\% \times 1,900 \frac{\text{mg}}{\text{L}} = \underline{1,425 \frac{\text{mg}}{\text{L}}}$

$$\frac{F}{M} = \frac{Q \times BOD}{V_{ab} \times MLVSS} = \frac{136,000 \text{ gpd} \times 260 \frac{\text{mg}}{\text{L}}}{84,000 \text{ gal} \times 1,425 \frac{\text{mg}}{\text{L}}} = .30 \frac{\text{lb BOD}}{\text{lb VSS} \cdot \text{day}}$$

F:M Ratio Practice Problem

The following data was collected for the performance of an activated sludge plant. What is the F:M ratio for this plant?

BOD = 250 mg/L

Biomass = 80% of solids

Tank Volume = 0.9 MG

Flow = 3.2 MGD

MLSS = 3,100 mg/L

$$F:M = \frac{\text{lb BOD}}{\text{lb VSS} \cdot \text{day}}$$

1) Calculate MLVSS: $MLVSS = 80\% \times MLSS \text{ concentration} = 80\% \times 3,100 \frac{mg}{L} = 2,480 \frac{mg}{L}$

$$\frac{F}{M} = \frac{Q \times BOD}{V_{ab} \times MLVSS} = \frac{3.2 \frac{MG}{d} \times 250 \frac{mg}{L}}{0.9 MG \times 2,480 \frac{mg}{L}} = 0.36 \frac{\text{lb BOD}}{\text{lb VSS} \cdot \text{day}}$$

Sludge Age

Indicates the average amount of time that microorganisms or solids spend in the activated sludge process

Ensures correct types of microbes are present and wastewater treatment is optimized

$$\text{sludge age (days)} = \frac{\text{mass of solids in aeration tank}}{\text{mass rate of solids entering aeration tank}} = \frac{V \times \text{MLSS}}{Q \times \text{TSS}_{\text{INF}}}$$

Operator certification tests and plant operations typically utilize more specific variants

- Solids Retention Time
- Minimum Cell Retention Time

SRT vs MCRT

Some certifications treat these interchangeably, but some provide slightly different equations

- Sac State course uses SRT
- ABC Testing Formula/ Conversion Table treats them interchangeably

MCRT equations sometimes do not include the TSSs in the secondary clarifier or only account for living solids

$$\text{SRT or MCRT, days} = \frac{(\text{Aeration Tank TSS, lb}) + (\text{Clarifier TSS, lb})}{(\text{TSS Wasted, lb/d ay}) + (\text{Effluent TSS, lb/d ay})}$$

$$\text{SRT or MCRT, days} = \frac{(\text{Aeration Tank TSS, kg}) + (\text{Clarifier TSS, kg})}{(\text{TSS Wasted, kg/d ay}) + (\text{Effluent TSS, kg/d ay})}$$

Activated sludge process with ONLY BOD removal, have an SRT range of 1-5 days

SRT Equation Adjustments

$$\frac{[(V_{ab}MG \times MLSS \text{ mg/L}) + (V_{sc}MG \times TSS_{sc} \text{ mg/L})]}{[(Q_{eff}MGD \times TSS_{eff} \text{ mg/L}) + (Q_{was}MGD \times TSS_{was} \text{ mg/L})]} \frac{8.34 \text{ lbs}}{\text{gal}} \frac{8.34 \text{ lbs}}{\text{gal}}$$

No TSS for secondary clarifiers

$$\frac{(V_{ab}MG + V_{sc}MG) \times MLSS \text{ mg/L}}{[(Q_{eff}MGD \times TSS_{eff} \text{ mg/L}) + (Q_{was}MGD \times TSS_{was} \text{ mg/L})]}$$

Solids are immediately pumped from the secondary clarifier

$$\frac{V_{ab}MG \times MLSS \text{ mg/L}}{[(Q_{eff}MGD \times TSS_{eff} \text{ mg/L}) + (Q_{was}MGD \times TSS_{was} \text{ mg/L})]}$$

Solids in effluent are considered negligible

$$\frac{V_{ab}MG \times MLSS \text{ mg/L}}{Q_{was}MGD \times TSS_{was} \text{ mg/L}}$$

SRT Example 1

Given the following data for an activated sludge process, calculate the SRT.

Aeration Basin		
Volume	V_{ab}	0.9 MG
Secondary Clarifier		
Volume	V_{sc}	0.5 MG
Influent Flow	Q	3.6 MGD
Waste Sludge Flow	Q_{WAS}	0.14 MGD
Mixed Liquor		
Suspended Solids	MLSS	3200 mg/L
Waste Sludge		
Suspended Solids	TSS_{WAS}	7000 mg/L
Final Effluent		
Suspended Solids	TSS_{eff}	9 mg/L
Secondary Clarifier		
Suspended Solids	TSS_{sc}	540 mg/L

SRT or MCRT, days

$$= \frac{[(V_{ab} \text{ MG} \times \text{MLSS mg/L}) + (V_{sc} \text{ MG} \times TSS_{sc} \text{ mg/L})]}{[(Q_{eff} \text{ MGD} \times TSS_{eff} \text{ mg/L}) + (Q_{was} \text{ MGD} \times TSS_{was} \text{ mg/L})]}$$

$$= \frac{[(0.9 \text{ MG} \times 3200 \text{ mg/L}) + (0.5 \text{ MG} \times 540 \text{ mg/L})]}{[(3.6 \text{ MGD} \times 9 \text{ mg/L}) + (0.14 \text{ MGD} \times 7200 \text{ mg/L})]}$$

$$= 3.03 \text{ days}$$

Sludge Wasting

Process by which excess biomass or MLSS is remove from activated sludge processes

Referred to as waste activated sludge (WAS)

Variable that can be manipulated most readily to adjust F:M ratio and sludge age, MCRT and SRT

- There is limited control of influent, effluent, and their associated biomass or MLSS once the processes are operating
- The pumping of solids from the secondary clarifier can be adjusted easily

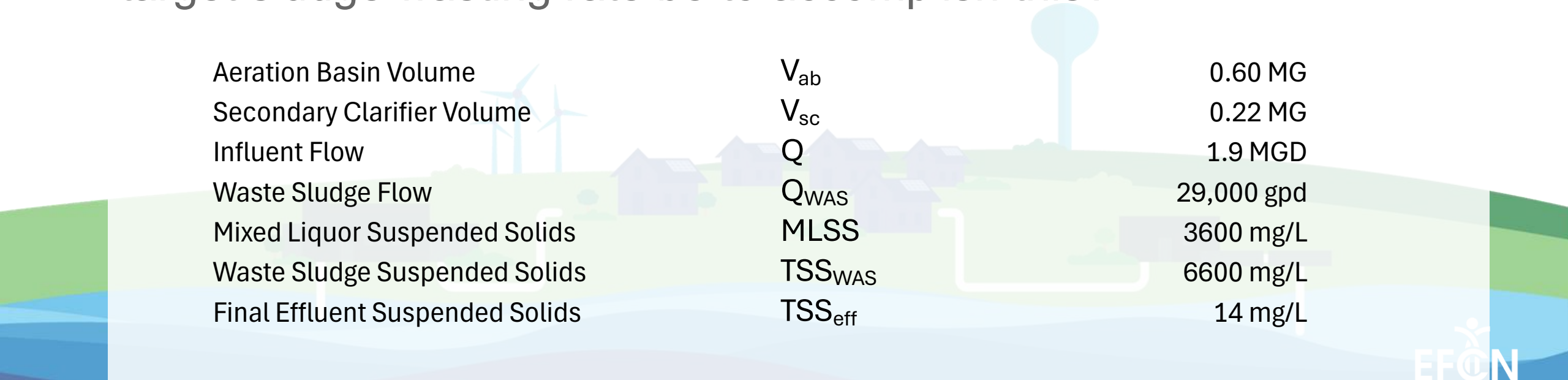
Rearrange SRT equation to calculate WAS rate:

Wasting Rate or Q_{WAS}

$$= \frac{MLSS \left(\frac{mg}{L} \right) \times [Volume_{Aerator}(Gal) + Volume_{Secondary\ Clarifier}(Gal)]}{SRT} - \left[TSS_{EFF} \left(\frac{mg}{L} \right) \times Q_{EFF} \left(\frac{Gal}{day} \right) \right]$$
$$TSS_{WAS} \left(\frac{mg}{L} \right)$$

Sludge Wasting Rate Example

Data was collected for a conventional activated sludge plant that is experiencing decreased treatment efficiency and is provided below. To decrease the sludge age of the microbial population in the the plant manager would like to decrease the SRT to 6 days to more closely resemble the design specifications. What should the target sludge wasting rate be to accomplish this?



Aeration Basin Volume	V_{ab}	0.60 MG
Secondary Clarifier Volume	V_{sc}	0.22 MG
Influent Flow	Q	1.9 MGD
Waste Sludge Flow	Q_{WAS}	29,000 gpd
Mixed Liquor Suspended Solids	MLSS	3600 mg/L
Waste Sludge Suspended Solids	TSS_{WAS}	6600 mg/L
Final Effluent Suspended Solids	TSS_{eff}	14 mg/L

Sludge Wasting Rate Example Cont'd

Aeration Basin Volume	V_{ab}	0.60 MG
Secondary Clarifier Volume	V_{sc}	0.22 MG
Influent Flow	Q	1.9 MGD
Waste Sludge Flow	Q_{WAS}	29,000 gpd
Mixed Liquor Suspended Solids	MLSS	3600 mg/L
Waste Sludge Suspended Solids	TSS_{WAS}	6600 mg/L
Final Effluent Suspended Solids	TSS_{eff}	14 mg/L

SRT = 6 days

$$\text{Wasting Rate or } Q_{WAS} = \frac{MLSS \left(\frac{mg}{L} \right) \times [Volume_{Aerator}(MG) + Volume_{Secondary\ Clarifier}(MG)]}{\text{SRT}} - \left[TSS_{EFF} \left(\frac{mg}{L} \right) \times Q_{EFF} \left(\frac{MG}{day} \right) \right] \div TSS_{WAS} \left(\frac{mg}{L} \right)$$

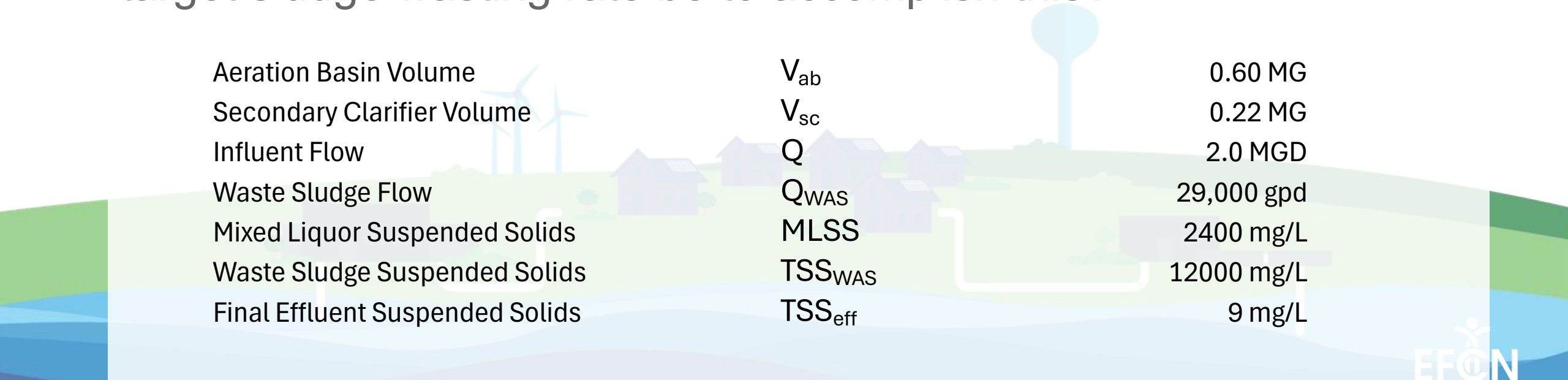
$$\text{Wasting Rate or } Q_{WAS} = \frac{3600 \frac{mg}{L} \times [0.6\ MG + 0.22\ MG]}{6\ days} - \left[14 \frac{mg}{L} \times 1.9 \frac{MG}{day} \right] \div 6600 \frac{mg}{L}$$

Answer= 0.0705 MGD = 70,500 gpd

Tripling the wasting rate would be too drastic, and it is likely you would want to increase slower over a couple days.

Sludge Wasting Rate Practice

Data was collected for a conventional activated sludge plant that is experiencing decreased treatment efficiency and is provided below. To decrease the sludge age of the microbial population in the the plant manager would like to decrease the SRT to 7 days to more closely resemble the design specifications. What should the target sludge wasting rate be to accomplish this?



Aeration Basin Volume	V_{ab}	0.60 MG
Secondary Clarifier Volume	V_{sc}	0.22 MG
Influent Flow	Q	2.0 MGD
Waste Sludge Flow	Q_{WAS}	29,000 gpd
Mixed Liquor Suspended Solids	MLSS	2400 mg/L
Waste Sludge Suspended Solids	TSS_{WAS}	12000 mg/L
Final Effluent Suspended Solids	TSS_{eff}	9 mg/L

Sludge Wasting Rate Practice

Aeration Basin Volume	V_{ab}	0.60 MG
Secondary Clarifier Volume	V_{sc}	0.22 MG
Influent Flow	Q	2.0 MGD
Waste Sludge Flow	Q_{WAS}	29,000 gpd
Mixed Liquor Suspended Solids	MLSS	2400 mg/L
Waste Sludge Suspended Solids	TSS_{WAS}	12000 mg/L
Final Effluent Suspended Solids	TSS_{eff}	9 mg/L

SRT = 7 days

$$Wasting Rate or Q_{WAS} = \frac{MLSS \left(\frac{mg}{L} \right) \times [Volume_{Aerator}(Gal) + Volume_{Secondary Clarifier}(Gal)]}{SRT} - \left[TSS_{EFF} \left(\frac{mg}{L} \right) \times Q_{EFF} \left(\frac{Gal}{day} \right) \right] \div TSS_{WAS} \left(\frac{mg}{L} \right)$$

$$Wasting Rate or Q_{WAS} = \frac{2400 \frac{mg}{L} \times [0.6 MG + 0.22 MG]}{7 days} - \left[9 \frac{mg}{L} \times 2 \frac{MG}{day} \right] \div 12000 \frac{mg}{L}$$

Answer= 0.0336 MGD = 33,600 gpd

Tripling the wasting rate would be too drastic, and it is likely you would want to increase slower over a couple days.

Sludge Volume Index (SVI)

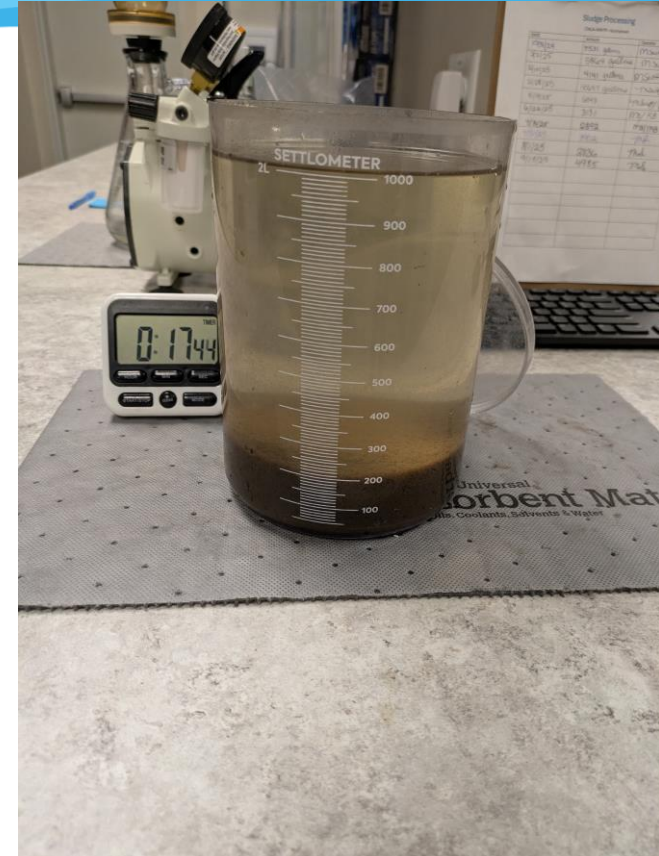
SVI describes the settling of sludge

Measurement of the volume occupied by activated sludge after settling for 30 minutes

Tested in the lab using a settleability test

- 1-2 liters monitored in a beaker
- The sample is allowed to sit for 30 minutes
- Sludge volume recorded at 5 and 30 minutes

$$\text{Sludge Volume Index, mL/g} = \frac{\frac{V_{30, \text{mL}}}{V_{\text{sample, L}}} \times 1,000 \text{ mg/g}}{\text{MLSS, mg/L}}$$



SVI Example

An operator collecting his normal samples for an activated sludge plant places 1-L of mixed liquor in a wide mouth beaker. The MLSS concentration for this sample is 2600 mg/L and the sludge volume after 30-minutes was 390 mL. Calculate the SVI.

$$\text{Sludge Volume Index, mL/g} = \frac{V_{30, \text{mL}}}{V_{\text{sample, L}}} \times 1,000 \text{ mg/g} \div \text{MLSS, mg/L}$$

$$\text{SVI} = \frac{\frac{390 \text{ mL}}{1 \text{ L}} \times 1,000 \text{ mg/g}}{2600 \text{ mg/L}} = 150 \text{ mL/g}$$

SVI Practice

An operator collecting his normal samples for an activated sludge plant places 2-L of mixed liquor in a wide mouth beaker. The MLSS concentration for this sample is 2900 mg/L and the sludge volume after 30-minutes was 487 mL. Calculate the SVI.

$$\text{Sludge Volume Index, mL/g} = \frac{\frac{V_{30}, \text{ mL}}{V_{\text{sample}}, \text{ L}} \times 1,000 \text{ mg/g}}{\text{MLSS, mg/L}}$$

$$\text{SVI} = \frac{\frac{487 \text{ mL}}{2 \text{ L}} \times 1,000 \text{ mg/g}}{2900 \text{ mg/L}} = 84 \text{ mL/g}$$

Final Thoughts

Practice!!!!!!

Become efficient with unit conversions

ALWAYS include units

➤ Practice cancelling units



Questions?

CONTACT INFORMATION



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