

Operator Quiz Test No. 107 – Formula Exam

The following questions are designed for trainees as they prepare to take the ABC wastewater operator test. It is also designed for existing operators to test their knowledge. Each issue of *Clear Waters* will have more questions from a different section of wastewater treatment. Good Luck!

- If the concentration of total suspended solids is 44 mg/L and the flow is 170,000 gallons per day, calculate the pounds per day of total suspended solids.
 - 94.6 lbs./day
 - 62.38 lbs./day
 - 122.07 lbs./day
 - 9.46 lbs./day
- Calculate the BOD₅ using the following:
Initial DO = 7.4 mg/L
Final DO = 4.5 mg/L
Sample = 15 mL
 - 43.5 mg/L
 - 4.35 mg/L
 - 77.65 mg/L
 - 58.0 mg/L
- What is the chlorine demand in mg/L of wastewater under the following conditions:
Flow = 5.0 mgd
Feed Rate = 90 lbs. /day
Chlorine Residual = 0.5 mg/L
 - 1.66 mg/L
 - 1.39 mg/L
 - 2.22 mg/L
 - 0.96 mg/L
- A tank that is 25 ft. wide, 100 ft. long, 12 ft. deep and has a flow through it of 2 mgd will have a detention time of what?
 - 2.7 hours
 - 20.1 hours
 - 4.5 hours
 - 4.5 hours
- What is the food/microorganism ratio given the following conditions:
MLSS = 2500 mg/L
Influent BOD₅ = 210 mg/L
Aeration Tank Volume = 125,000 gallons
Primary Effluent BOD₅ = 102 mg/L
Flow = 235,000 gallons per day
Mixed Liquor is 75% volatile
 - 0.3
 - 0.2
 - 0.05
 - 0.1
- What is the percent removal of total suspended solids given the following information:
Influent TSS = 170 mg/L
Effluent TSS = 14 mg/L
Effluent BOD₅ = 21 mg/L
Flow = 3.7 mgd
 - 98.1%
 - 91.8%
 - 95.6%
 - 92.8%

Answer the following questions based on the plant information below. The secondary system consists of 2 rectangular aeration tanks and 2 circular clarifiers.

Parameter	Values
Raw Waste Water Flow	4MGD
Influent TSS	180 mg/L
Influent BOD	200 mg/L
Primary Effluent BOD	180 mg/L
Primary Clarifier Dimensions	Diameter = 60' Depth = 12'
Aeration Tank Dimension	100' x 15' x 20'
Each Secondary Clarifier Volume	1,500 cu.ft.
Aeration MLVSS	2800 mg/L
Aeration MLSS	3500 mg/L
30 Min Settling Test Volume	200 ml/L
WAS Flow	.025 mgd
WAS TSS	4500 mg/L
Effluent TSS	2.5 mg/L
Effluent BOD	5 mg/L

- What is the sludge volume index (SVI) of the plant aeration system?
 - 85.6
 - 50.1
 - 57.1
 - 157.1
- What is the mean cell residence time (MCRT) of the aeration system?
 - 8.5 days
 - 9.8 days
 - 13.5 days
 - 12.8 days
- What is the percent removal of BOD?
 - 97.5%
 - 95.7%
 - 99.2%
 - 89.7%
- What is the Food to Mass ratio (F/M)?
 - 0.75
 - 1.22
 - 0.65
 - 0.57
- What is the total suspended solids percent removal?
 - 96.8%
 - 92.5%
 - 89.6%
 - 98.6%
- What is the detention time in the primary clarifier?
 - 1.52 hours
 - 2.75 hours
 - 3.55 hours
 - 1.75 hours

Answers on page 62.

For those who have questions concerning operator certification requirements and scheduling, please contact Tanya May Jennings at 315-422-7811 ext. 4, tmj@nywea.org, or visit www.nywea.org/OpCert.