



Roy Pelletier

Test Your Knowledge of Emerging Issues and Water Resources Management

- In which form are nutrients better utilized by microorganisms in a biological treatment process?
A. Particulate B. Solid
C. Gaseous D. Soluble
- An industrial facility has a confined space manhole with hazardous gas, and the vapor density of the hazardous gas present is 1.15; where is this gas more likely to be found?
A. Near the ceiling.
B. Equally distributed throughout the space.
C. Near the floor.
D. At this density, the gas will dissipate immediately.
- What is a typical return activated sludge (RAS) to Q ratio for an extended aeration activated sludge process?
A. 10 to 25 percent
B. 25 to 50 percent
C. 1 to 2 percent
D. 75 to 100 percent
- Heavy metals are considered a pollutant because of their
A. color. B. appearance.
C. weight. D. toxicity.
- In what section of the 40 Code of Federal Regulation (CFR) will you find general pretreatment regulations?
A. 408 B. 403
C. 406 D. 412
- What happens to the activity rate of activated sludge microorganisms as the wastewater temperature increases by 10°C?
A. It triples.
B. It doubles.
C. It remains the same.
D. It is cut in half.
- Given the following data, calculate the carbonaceous biochemical oxygen demand (CBOD₅) in a sample of industrial wastewater:
 - Sample volume = 2 ml
 - Initial dissolved oxygen (DO) = 6.2 mg/L
 - Final DO = 3.9 mg/LA. 460 mg/L B. 250 mg/L
C. 345 mg/L D. 587 mg/L
- An industrial waste facility has a total suspended solids (TSS) concentration value of 1,560 mg/L entering its pretreatment process, with a final TSS value exiting the process of 275 mg/L just prior to entering the local sanitary sewer. Calculate the percent removal of TSS in the pretreatment process.
A. 29.3 percent B. 60.7 percent
C. 25.5 percent D. 82.4 percent
- What may be the most common factor on which a stormwater utility is based?
A. Property value
B. Impervious area
C. Amount of annual rainfall
D. Location of a water reclamation facility
- What does the word "aliquot" mean?
A. Composite sample
B. Grab sample
C. The total volume of a sample
D. A portion of a sample

Answers on page 66

SEND US YOUR QUESTIONS

Readers are welcome to submit questions or exercises on water or wastewater treatment plant operations for publication in Certification Boulevard. Send your question (with the answer) or your exercise (with the solution) by email to roy.pelletier@cityoforlando.net, or by mail to:

Roy Pelletier
Wastewater Project Consultant
City of Orlando
Public Works Department
Environmental Services
Wastewater Division
5100 L.B. McLeod Road
Orlando, FL 32811
407-716-2971

LOOKING FOR ANSWERS?

Check the Archives

Are you new to the water and wastewater field? Want to boost your knowledge about topics you'll face each day as a water/wastewater professional?

All past editions of Certification Boulevard through the year 2000 are

available on the Florida Water Environment Association's website at www.fwea.org. Click the "Site Map" button on the home page, then scroll down to the Certification Boulevard Archives, located below the Operations Research Committee.

Certification Boulevard Answer Key

From page 58

- 1. D) Soluble**
Think of solids as “steak” for the bugs; they have to break it down before they can consume it. However, think of soluble as a “milk shake,” which is more readily consumable by the bugs.
- 2. C) Near the floor.**
Gases with a density of greater than 1.0 will settle to the bottom of its space, whereas gases with a density less than 1.0 will rise to the top of its space.
- 3. D) 75 to 100 percent**
- 4. D) Toxicity**
Exposure to metals may occur through the diet, from medications, from the environment, or in the course of work or play. Where heavy metal toxicity is suspected, time taken to perform a thorough dietary, occupational, and recreational history is time well spent, since identification and removal of the source of exposure is frequently the only therapy required.
- 5. B) 403**
40 CFR Part 403 - General Pretreatment Regulations for existing and new sources of pollution.
- 6. B) It doubles.**
Warmer temperatures will speed up the activity of microorganisms; colder temperatures will slow down the activity of the bugs—much like people!
- 7. C) 345 mg/L**
$$\begin{aligned} \text{CBOD}_5, \text{ mg/L} &= (\text{Initial DO, mg/L} - \text{Final DO, mg/L}) \div (\text{sample volume, ml} \div 300 \text{ ml}) \\ &= (6.2 - 3.9) \div (2 \text{ ml} \div 300 \text{ ml}) \\ &= 2.3 \div 0.00667 \\ &= 344.8 \text{ mg/L} \end{aligned}$$
- 8. D) 82.4 percent**
$$\begin{aligned} \text{Percent TSS Removal} &= (\text{Inlet TSS, mg/L} - \text{Outlet TSS, mg/L}) \div \text{Inlet TSS, mg/L} \times 100 \\ &= (1,560 \text{ mg/L} - 275 \text{ mg/L}) \div 1,560 \text{ mg/L} \times 100 \\ &= 1,285 \div 1,560 = 0.8237 \times 100 \\ &= 82.4 \text{ percent} \end{aligned}$$
- 9. B) Impervious Area**
Impervious means not permitting penetration or passage; impenetrable. For instance, “The coat is impervious to rain.”
- 10. D) A portion of a sample.**
Aliquot: A sample that is representative of the whole; a portion of the sample. A number that will divide another without a remainder. For instance, “2 is an aliquot of 6.”