Certification Boulevard

Roy Pelletier

Test Your Knowledge of Conservation & Reuse

1. Given the following information, does this reuse water quality satisfy the FDEP requirements for fecal coliform standards?
   - 80 percent of the sample is below the detection limits per 100 ml of sample.
   - The highest day of the month was six per 100 ml of sample.

   a. Yes, this meets typical requirements in Florida for reuse water fecal coliform.
   b. No, this fails to meet typical requirements in Florida for reuse water fecal coliform.

2. What is a typical permit requirement for chlorine residual maintenance of reuse water that is being applied to a Rapid Infiltration Basin in Florida?
   a. No greater than 1.0 mg/L Total Chlorine Residual
   b. No less than 0.5 mg/L Total Chlorine Residual
   c. No less than 1.0 mg/L Total Chlorine Residual
   d. No greater than 0.5 mg/L Total Chlorine Residual

3. What are the units of this formula?
   - **Filter Inlet Flow ÷ Filter Surface Area**

   a. gpd/ft^3 b. lbs/day/ft^2
   c. gpm/ft^2 d. lbs/minute/ft^2

4. Given the following data, what is the TSS concentration of this reuse grab sample, and does it meet the FDEP requirements for reclaimed water TSS standards?
   - 100 ml of sample.
   - Tare weight of filter is 11.8873 grams.
   - Final weight of filter after drying is 11.8877 grams.

   a. 10 mg/L - No b. 4 mg/L - No
   c. 6 mg/L - No d. 4 mg/L - Yes

5. What is a typical permit requirement for chlorine residual maximum of effluent disposal in an open body of water, other than the ocean?
   a. No greater than 0.01 mg/L Total Chlorine Residual
   b. No less than 0.5 mg/L Total Chlorine Residual
   c. No greater than 1.0 mg/L Free Chlorine Residual
   d. No less than 0.1 mg/L Total Chlorine Residual

6. What is the final effluent TSS value if the plant influent TSS is 225 mg/l, and the TSS percent removal is 97 percent?
   a. 7.65 mg/l b. 3 mg/l
   c. 6.75 mg/l d. 3.375 mg/l

7. What is the basic purpose for filtration of secondary effluent?
   a. To make up for poor secondary treatment.
   b. To remove ammonia.
   c. To remove NO2.
   d. To remove TSS and viruses.

8. Other than sand, what is a typical media used in rapid gravity filters?
   a. D.E. powder b. Anthracite coal
   c. Clay d. Talcum powder

9. If one cell of an effluent filter is taken out of service, what is the effect on the remaining cells?
   a. The hydraulic loading rate will not be affected.
   b. The hydraulic loading rate will be increased.
   c. The hydraulic loading rate will be decreased.
   d. All filter cells must remain in service, regardless of the flow rate.

10. Why should a sample of spent washwater be collected during a backwash?
    a. To check for solids content.
    b. To check for chlorine residual.
    c. To check for lost media.
    d. To place into final effluent sampler.

ANSWERS ON PAGE 70

Readers are welcome to submit questions or exercises on water or wastewater treatment plant operations for publication in *Certification Boulevard*. Mail your question (with the answer) or your exercise (with the solution) to Roy Pelletier, City of Orlando Public Works Department, 5100 L.B. McLeod Road, Orlando, FL 32811. Or send it by e-mail to roy.pelletier@cityoforlando.net.

Looking for Answers? Here Are the Questions

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* back through the year 2000 are available on the Florida Water Environment Association's Web site at the following Internet address.

http://www.fwea.org/cms/index.cfm?primary keylist=,234,248,264,1756

This will take you to a Web page titled "Quizzes and Case Studies." All *Certification Boulevard* questions and answers since January 2006 are posted on this page.

Also, near the top left corner of the page above the "Quizzes and Case Studies" title, click on the phrase "Archives CBTS" to access all *Certification Boulevard* questions and answers dating back to the year 2000.

CORRECTION

Question 3, February 2007

The question reads, "If the velocity of a stream of water is 75 cubic feet per minute, what is the volume of the stream in mgd?" Dimensionless units for "velocity" are "distance per time" and for "volume" are simply "volume" or "quantity." Since the question addresses flow rates (i.e., "volume" or "quantity" per time), "velocity" should be changed to "flow rate" or equivalent; similarly for the word "volume."

The question should read: If the flow rate of a stream of water is 75 cubic feet per minute, what is the volume, or ***flow rate***, of the stream in mgd?

Jerry A. Valcik, P.E., BCEE, F.NSPE
A "rewired" (not retired)
professional water engineer
Ormond Beach

Words are like tools …
the right word for
the right application.

Thank you Jerry—Roy

Certification Boulevard Answer Key

From page 15

1. **Yes, this meets typical requirements in Florida for reuse water fecal coliform.**
   The rule for fecal coliform in reuse water states: "Over a 30 day period, 75 percent of the fecal coliform values (the 75% percentile value) shall be below detection limits. Any one sample shall not exceed 25 fecal coliform values per 100 ml of sample."

2. **b. No less than 0.5 mg/L Total Chlorine Residual**

3. **c. gpm/ft^2**
   This (gpm per sq. ft.) is typically referred to as hydraulic loading rate for effluent filtration.

4. **c. 6 mg/L - No**
   TSS, mg/L
   = (final wt., gm – tare wt., gm) x 10,000
   = (11.8879 gm – 11.8873 gm) x 10,000
   = 6 mg/L
   No, the FDEP standard for reclaimed water TSS is no greater than 5.0 mg/L.

5. **a. No greater than 0.01 mg/L Total Chlorine Residual.**

6. **c. 6.75 mg/l**
   Influent TSS of 225 mg/l x 0.03
   = Effluent TSS of 6.75 mg/l
   = (100% - 97% = 3%)

7. **d. To remove TSS and viruses.**

8. **b. Anthracite coal**

9. **b. The hydraulic loading rate will be increased.**
   The hydraulic loading rate for effluent filtration is typically measured in gallons per minute per square foot of surface area. When you remove a filter cell from service, the overall filtration surface area is reduced (reduced square feet of media). This, in turn, increases the revised hydraulic loading rate because the same amount of flow is now being applied to fewer square feet of filter media.

10. **c. To check for lost media.**
    If media is lost, it will typically leave the filter with the spent backwash water.