



Certification Boulevard

Roy Pelletier



Test Your Knowledge of Distribution and Collections

- Given the following data, how many cubic yards of backfill are needed to fill a trench?
 - 5.25 feet wide
 - 14 yards long
 - 5.5 feet deep
 - 62 yd³
 - 45 yd³
 - 404 yd³
 - 18 yd³
- What is the most important reason why the pumps in a lift station should not experience frequent starts and stops?
 - Not enough time for the pumps to be primed
 - Because of the power surge problems
 - Ultimately will result in premature failure of the check valve assembly
 - Ultimately will result in premature failure of the motor winding insulation
- What type of machine is used to construct collection system pipelines when they are too difficult for trench excavations?
 - Pig
 - TV device
 - Boring machine
 - Backhoe machine
- What should be done when a mechanical seal develops a leak?
 - It needs a new o-ring
 - Never repair it; just replace it with a new one
 - May require re-lapping or it may have to be replaced
 - Something is wrong with the stuffing box
- True or False: Water seeping into a collection system pipe is called exfiltration.
- What is the pipeline called that is installed on the discharge side of a sewage pump?
 - Suction
 - Sump
 - Gravity
 - Force main
- Which type of sewer system contains both sanitary wastewater and stormwater?
 - Domestic wastewater system
 - Combined sewer system
 - Separate collection system
 - Sewer system evaluation survey

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.

- Given the following data, what is the capacity of this wet well?
 - wet well diameter is 15 feet
 - bottom elevation of wet well is 82.71 feet
 - top elevation of wet well is 99.85 feet
 - 22,645 gallons
 - 222,645 ft³
 - 332,043 ft³
 - 44,391 gallons
- Which gas will be located at the highest point of a manhole?
 - Carbon dioxide
 - Hydrogen sulfide
 - Methane
 - None—they will all be at low levels
- True or False: When a flap gate is mounted in a pipe, the flow will be allowed to travel in both directions?

Answers on page 58

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 e-mail to roy.pelletier@cityoforlando.net, or by mail to:

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Certification Boulevard Answer Key

From page 28

1. **A. 45 yd³**

Cubic yards

$$\begin{aligned} &= 5.25 \text{ feet wide} \times (14 \text{ yards long} \times 3 \text{ feet} \\ &\quad \text{per yard}) \times 5.5 \text{ feet deep} \div 27 \text{ ft}^3 \text{ per yd}^3 \\ &= 44.92 \text{ yd}^3 \end{aligned}$$

2. **D. They ultimately will result in premature failure of the motor winding insulation**

3. **C. Boring machine**

4. **C. It may require re-lapping or it may have to be replaced**

5. **False**

Waste leaking out of a collection system pipe is called exfiltration. Water seeping into a collection system pipeline is called infiltration.

6. **D. Force main**

A force main is under pressure; a gravity main requires gravity to transport the wastewater.

7. **B. Combined sewer system**

8. **A. 22,645 gallons**

Liquid depth in wet well

$$\begin{aligned} &= 99.85 \text{ feet} - 82.71 \text{ feet} \\ &= 17.14 \text{ feet} \end{aligned}$$

Gallons capacity

$$\begin{aligned} &= 0.785 \times \text{diameter}^2 \times \text{depth} \times 7.48 \text{ gal per ft}^3 \\ &= 0.785 \times 15 \text{ feet} \times 15 \text{ feet} \times 17.14 \text{ feet} \times \\ &\quad 7.48 \text{ gal per ft}^3 \\ &= 22,644.6 \text{ gallons} \end{aligned}$$

9. **C. Methane**

The molecular weight of carbon dioxide is 44.01, hydrogen sulfide is 34.076, and methane is 16.043. With methane being the lightest gas, it will rise to the highest point of a space.

10. **False**

A flap gate (or check valve) allows flow to travel in one direction only.

