37.50 An open loop condenser water system holds $20,000$ *gallons*. The system is to be treated with a 45% by volume biocide solution until the average concentration after mixing is $10ppm$. Ignoring evaporation and the addition of make-up water, what volume of the solution is required?

A. $0.2gal$

B. $0.4gal$

C. $2gal$

D. $4gal$

The final concentration of biocide is 10 parts per million (ppm). Calculate the volume of biocide needed to achieve this concentration.

$$20,000gal\left(\frac{10}{10^6}\right) = 0.2gal$$

If the solution being added is only 45% biocide, the volume of the *solution* required is larger than the volume of the active chemical. It is inferred that the remaining 55% of the solution is inactive, probably water. Calculate the volume of the solution needed to provide $0.2gal$ of biocide.

$$\frac{0.2gal}{0.45} = 0.44gal$$

Answer B