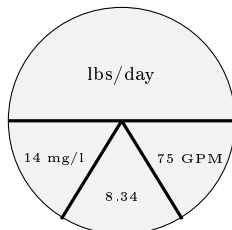


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1. A water treatment plant produces 150,000 gallons of water every day. It uses an average of 2 pounds of permanganate for iron and manganese removal. What is the dose of the permanganate?
 2. A treatment plant has a maximum output of 30MGD and doses ferric chloride at 75 mg/L. How many pounds of Ferric Chloride does the plant use in a day?
 3. A treatment plant uses 750 pounds of alum a day as it treats 15MGD. What was the dose rate?
 4. A treatment plant operates at 1,500 gallons a minute and uses 500 pounds of alum a day. What is the alum dose?

Solution:

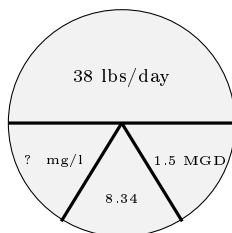
1. A water treatment plant operates at the rate of 75 gallons per minute. They dose soda ash at 14 mg/L. How many pounds of soda ash will they use in a day?



$$\frac{\text{lbs}}{\text{day}} = \text{Flow} \frac{\text{MG}}{\text{day}} * \text{Concentration} \frac{\text{mg}}{\text{l}} * 8.34$$

$$\frac{\text{lbs}}{\text{day}} = 75 \frac{\text{gallons}}{\text{min}} * 1440 \frac{\text{min}}{\text{day}} * \frac{\text{MG}}{1,000,000 \text{ gallons}} * 250 \frac{\text{mg}}{\text{l}} * 8.34 = \boxed{225 \frac{\text{lbs}}{\text{day}}}$$

2. Solution:

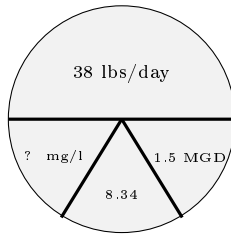


$$\frac{\text{lbs}}{\text{day}} = \text{Flow} \frac{\text{MG}}{\text{day}} * \text{Concentration} \frac{\text{mg}}{\text{l}} * 8.34 \implies \text{Concentration} \frac{\text{mg}}{\text{l}} = \frac{\frac{\text{lbs}}{\text{day}}}{\text{Flow} \frac{\text{MG}}{\text{day}} * 8.34} \text{Concentration} \frac{\text{mg}}{\text{l}} =$$

$$\frac{38 \frac{\text{lbs}}{\text{day}}}{1.5 \frac{\text{MG}}{\text{day}} * 8.34} = \boxed{3 \frac{\text{mg}}{\text{l}}}$$

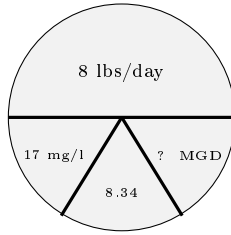
3. Solution:

$$\frac{\text{lbs}}{\text{day}} = \text{Flow} \frac{\text{MG}}{\text{day}} * \text{Concentration} \frac{\text{mg}}{\text{l}} * 8.34 \implies \text{Concentration} \frac{\text{mg}}{\text{l}} = \frac{\frac{\text{lbs}}{\text{day}}}{\text{Flow} \frac{\text{MG}}{\text{day}} * 8.34} \text{Concentration} \frac{\text{mg}}{\text{l}} =$$



$$\frac{2 \frac{\text{lbs}}{\text{day}}}{\left(150,000 \frac{\text{Gallons}}{\text{day}} * \frac{\text{MG}}{1,000,000 \text{ Gallons}} * 8.34 \right)} = \boxed{3 \frac{\text{mg}}{\text{l}}}$$

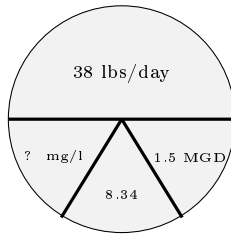
4. A water treatment plant uses 8 pounds of chlorine daily and the dose is 17 mg/l. How many gallons are they producing? Solution:



$$\frac{\text{lbs}}{\text{day}} = \text{Flow} \frac{\text{MG}}{\text{day}} * \text{Concentration} \frac{\text{mg}}{\text{l}} * 8.34$$

$$\Rightarrow \text{Flow} \frac{\text{MG}}{\text{day}} = \frac{\frac{\text{lbs}}{\text{day}}}{\text{Concentration} \frac{\text{mg}}{\text{l}} * 8.34} = \frac{8 \frac{\text{lbs}}{\text{day}}}{17 \frac{\text{mg}}{\text{l}} * 8.34} = 0.056425 \frac{\text{MG}}{\text{day}}$$

$$0.056425 \frac{\text{MG}}{\text{day}} * \frac{1,000,000 \text{ Gallons}}{\text{MG}} = \boxed{56,425 \text{ Gallons}}$$

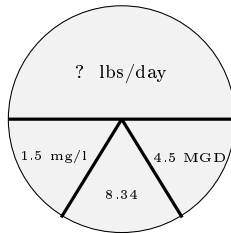


$$\text{lbs} = \text{Volume(MG)} * \text{Concentration} \frac{\text{mg}}{\text{l}} * 8.34$$

$$\implies \text{Concentration} \frac{\text{mg}}{\text{l}} = \frac{\text{lbs}}{\text{Volume(MG)} * 8.34} = \frac{40 \text{ lbs}}{80 \text{ gallons} * \frac{\text{MG}}{1,000,000 \text{ gallons}} * 8.34}$$

5. What is the influent plant loading of phosphorus in lbs/day if the plant flow is 4.5 MGD and the influent phosphorous concentration is 1.5 mg/l?

Solution:



$$1.5 \frac{\text{mg}}{\text{l}} * 4.5 \text{MGD} * 8.34 = \boxed{56 \text{ lbs/day}}$$