1. What is the solids content in mg/l of a 2.5% sludge?
   Answer: 25,000 mg/l

2. How many lbs of salt needs to be dissolved in water to make 1 liter of 5% salt solution?
   Solution:
   $5\%\ salt\ solution \implies 50,000\ mg/l\ salt$
   To prepare 1 litre of salt solution need to dissolve 50,000 mg or:
   $50,000\ mg * \frac{lb}{453.6\ gms} * \frac{gm}{1,000\ mg} = \boxed{0.11\ lb\ salt}$ in enough water to make 1 liter of solution.

3. What is the concentration in mg/l of 4.5% solution of that substance.

4. How many lbs of salt is needed to make 5 gallons of a 2500mg/l salt solution
   $2500mg/l = 2500ppm = \frac{2500\ lbs\ salt}{1,000,000\ lbs\ salt\ solution} * 5 * 8.34\ salt\ solution = \boxed{0.1\ lbs\ salt}$

5. An operator mixes 40 lb of lime in a 100-gal tank containing 80 gal of water. What is the percent of lime in the slurry? Solution:
   $$\left(\frac{40\ lbs\ lime}{80\ gal\ water * 8.34\frac{lbs}{gal\ water} + 40\ lbs\ lime} * \frac{1,000,000\ lbs}{million\ lbs}\right) * \frac{\%}{10,000\ ppm} = \boxed{5.7\%}$$