**Mixing Fluids of Different Densities**

(V1 D1) + (V2 D2) = VF DF

Where ;

V1 = volume of fluid 1 (bbl, gal, etc.)  
D1 = density of fluid 1 (ppg, lb/ft3, etc.)  
V2 = volume of fluid 2 (bU, gal, etc.)  
D2 = density of fluid 2 (ppg, lb/ft3, etc.)  
VF = volume of final fluid mix  
DF = density of final fluid mix

Sample Case 1 : A limit is placed on the desired volume :

Determine the volume of 11.0 ppg mud and 14.0 ppg mud required to build 300 bbl 11.5 (ppg) mud :

Given : 400 bbl of 11.0 ppg mud on hand, and  
 400 bbl of 14.0 ppg mud on hand

Solution : let V1 = bbl of 11.0 ppg mud  
 V2 = bbl of 14.0 ppg mud

then a. V1 + V2 = 300 bbl  
 b. (11.0) V1 + (14.0) V2 = (ll.5)(300)

Multiply Equation A by the density of the lowest mud weight (D1 = 11.0 ppg) and subtract the result from Equation B :

b. (11.0) (V1) + (14.0)(V2) = 3450  
a. (11.0) (V1) + (11.0)(V2) = 3300 \_

O (3.0) (V2) = 150

3 V2 = 150

V2 = 150/3

= 50

Therefore : V2 = 50 bbl of 14.0 ppg mud  
 V1 + V2 = 300 bbl  
 V1  = 300 - 5O  
 V1  = 250 bbl of ll.O ppg mud

Check : V1 = 50 bbl  
 D1 = 14.0 ppg  
 V2 = l50 bbl  
 D2 = 1l.O ppg  
 VF = 300 bbl  
 DF = final density (ppg)

(50) (14.0) + (250) (11.0) = 300 DF  
 700 + 2750 = 30O DF  
 3450 = 300 DF  
 3450 ÷ 300 = DF  
 11.5 ppg = DF

Sample Case 2 : No limit is placed on volume :

Determine the density and volume when the two following muds are mixed together :

Given : 400 bbl of 11.0 ppg mud, and  
 400 bbl of 14.0 ppg mud

Solution : let V1 = bbl of 11.0 ppg mud  
 D1 = density of 11.0 ppg mud  
 V2 = bbl of 14.0 ppg mud  
 D2 = density of 14.0 ppg mud  
 VF = final volume (bbl)

DF = final density (ppg)

Formula : (V1 D1) + (V2 D2) = VF DF

(400)(11.0) + (400)(14.0) = 800 DF

4400 + 5600 = 8000 DF

10,000 = 800 DF

l0,000 : 800 = DF

12.5 ppg = DF

Therefore : final volume = 800 bbl  
 final density = 12.5 ppg