Subject: Check for floatation on the 500 GPD night pumping Hoot Aerobic Treatment System covered with six inches of soil.

Note: The tank will float when the total mass of the tank at operating condition is less than the mass of the water it displaces.

A. Figure #1 is the cross section of a 500 GPD Night Pumping Hoot Aerobic Treatment System.

B. Calculation:

1. Given:

   a. Tank wt. plus Clarifier Chamber Hopper ——— 14,980 lbs (from Hoot Aerobic System)
   b. Soil wt. ——— 75 lbs/sq ft
   c. Water wt at 60 deg F——— 62.37 lbs/cu ft
   d. 1 cu ft ——— 7.48 gals

2. Calculate tank wt at operating condition with 6" soil cover **(Total Tk wt = Twt + Swt)**

   V1 = Volume of Pretreatment tk. At water level
   V2 = Volume of Aeration & Clarifier Chamber at water level
   V3 = Volume of Holding tk. at pump shut off

   a. Calculate tk wt at operating condition **(Twt)**

      Twt = 14,980 lbs + (A1 + A2 + A3 / 7.48 gals/cu ft) 62.37 lbs/cu ft

      = 14,980 lbs + (400 gals + 920 gals + 220 gals / 7.48 gals/cu ft) 62.37 lbs/cu ft

      = 27,821 lbs

   b. Calculated wt of 6" soil cover **(Swt.)**

      Swt = (L x W x H) 75 lbs/cu ft

      = (13.33' x 6.21' x 0.5') 75 lbs/cu ft

      = 3104 lbs

   c. **Total Tk wt** = Twt + Swt

      = 27,821 lbs + 3104 lbs

      = **30,925 lbs**

9/24/98

3. Calculate wt. Of water displacement **(H2Owt)**

   a. **H2Owt** = (L x W x H) 62.37 lbs/cu ft

      = (13.33 ft x 6.21 ft x 5.75 ft) 62.37 lbs/cu ft

      = 29,687 lbs

Conclusion: Total Tk wt. (30,925 lbs) is greater than water wt displaced (29,687 lbs). Therefore the 500 GPD Nigth Pumping Hoot Aerobic Treatment System at operation condition should not float.