Appendix C

Sewer Spill Estimation

EXAMPLE 1: To calculate the estimated amount of gallons in a ponded sewage spill you must determine the volume of the spill. If it is a rectangular contained area,

Volume = Length x Width x Depth x 7.48 gallons/cu. ft. = Gallons

A spill 100' x 100' x 6"=100' x 100' x .5' x 7.48 gal/cu. ft. = 37,400 gal

See illustration below for estimating the volume of a circular ponded area.

EXAMPLE 2: If you are dealing with a spill that has been running into a storm drain, you must estimate the gallons by the amount of time of the overflow times the number of connections on the receiving line (assume 240 gal per household per 24 hrs).

If you have a line with 6 houses on it, and it has been overflowing for 24 hrs:

6 houses x 240 gal/house = 1,440 gal

EX. 1a - Rectangular :

← 100 FT →

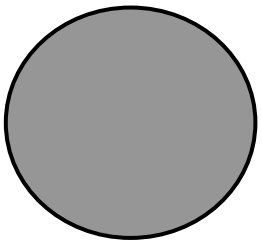
↑ 1 0 0 F T ↓

V. = 100' x 100' x 0.5' x 7.48
= 37,400 gal

EX. 1b – Circular:

← 100 FT →

↑ 1 0 0 F T ↓



V. = 100' x 100' x 0.5' x 0.7* x 7.48
= 26,180 gals

***Factor for estimating area of a circle as a portion of the area of a square.**

EXAMPLE 3a: If the overflow is less than 24 hours in duration, then the calculation must prorate the daily sewage generation rate. If you have 60 houses on a line that has been overflowing for 1 hr:

60 houses x 240 gal/day/house x 1 hr x 1day/24hr = 600 gal

EXAMPLE 3b: If you have 6 houses on a line that has been overflowing for 12 hours: 6 houses x 240 gal/day/house x 12 hrs x 1 day/ 24hr = 720 gal

Note that the time of day of the overflow should be considered in the calculation of its volume especially if the land use of the tributary area to the overflow is predominantly residential. Over 90% of the daily sewage discharge from an average home occurs between the hours of 6am and 12 midnight with 50-75% of the daily sewage discharge occurring between 8am to noon and 7pm to 11pm ("diurnal peak hours"). This could result in a flow rate of 15 to 22.5gal/hr during the diurnal peak hours vs. 10 gal/hr (average) over 24 hours.

If there is mixed land use tributary to an overflowing sewer, the following unit flow rates should be used in addition to the residential, as appropriate: hotel/motel - 100gpd/room; restaurant - 55 gpd/seat; business offices - 175 gpd/1000 sq. ft.; and, commercial/retail - 75 gpd/1000 sq. ft.

Wet weather conditions could further affect the per home daily sewage contribution due to I/I sources.

Source: City of Pacifica, California