Methodology of Estimating Pollution Load in Stormwater Drains of Yau Tong Area (due to Surface Runoff)

1. The daily amount of rainfall deposited in the Yau Tong Stormwater Catchment during the wet season have been quantified using the 30-year long term average rainfall data obtained from the Hong Kong Observatory:

   Total daily rainfall volume (m^3) =
   long term daily average rainfall amount in wet season (mm)
   x concerned catchment area (m^2) ÷ 1000 ---------- (1)

2. It is assumed that a rainfall volume of greater than 2.5mm on each day (rainfall intensity greater than 0.5mm/hr) will give rise to runoff. The rainfall volume in Eqt. (1) would have to be reduced according to the runoff percentage. The ratio of the rainfall volume for the days with runoff to the total rainfall volume for the wet season gives the runoff percentage. This can be expressed as:

   [(Sum of the rainfall volume for the days with rainfall volume > 2.5 mm and intensity > 0.5 mm/hr within the wet season) ÷ Total rainfall volume for the wet season] x 100%

3. Based on the average rainfall data for the period between 1 January 1980 and 31 December 1996, the runoff percentage for wet season is about 82%.

4. Table 6A.1 summarises the event mean concentrations of runoff samples collected at 2 locations (Tai Po and Tin Shui Wai) for the recent *EPD Pilot Study of Stormwater Pollution.* These concentrations would be used to estimate the pollution load from surface runoff.

Table 6A.1 Mean Event Concentrations for Stormwater Runoff

Parameter	Tai Po Data		Tin Shui Wai Data		Average
	Location 1	Location 2	Location 1	Location 2	
TSS (g/m^3)	46	35	28	64	43.25
BOD_5 (g/m^3)	15	30.6	12.2	32.1	22.48
Ortho-P (g/m^3)	0.07	0.06	0.02	0.02	0.04
TP (g/m^3)	0.2	0.2	0.1	0.3	0.20
NH_3N (g/m^3)	0.19	0.33	0.2	0.09	0.20
TKN	1.2	1.3	1.4	1.7	1.40
Cu (g/m^3)	0.015	0.023	0.012	0.009	0.01
Silicate (g/m^3)	3.3	3.7	3.4	2.7	3.28

(Source of information: EPD Pilot Study of Stormwater Pollution)

5. In summary, the pollution load in stormwater runoff would be equal to: Rainfall Volume (m^3) x Runoff Percentage (%) x Mean Event Concentration (g/m^3). Pollution load results for the study area are summarised in Table 6A.2.

Table 6A.2 Pollution Loads Results for Stormwater Runoff

Catchment Area	Impermeable Area m^2	Runoff Concentrations			Rainfall mm	Rainfall Volume m^3	Runoff Percentage	Runoff Volume	Pollution Load		
		BOD g/m^3	SS g/m^3	NH3N g/m^3					BOD g/d	SS g/d	NH3N g/d
Yau Tong	686700	22.48	43.25	0.2	11.86	8143	82%	6677	150098	288778	1335