

Appendix 5-2

Calculation of Pollution Loading of Stormwater During Operational Phase

Appendix 5-2A Calculation of Pollution Loading of Stormwater During Operational Phase of this Project

(A) Calculation of Pollution Loading from Surface Runoff

Rainfall Intensity (washing out pollutant) ^{##}	1386 mm/year		
BOD ₅ concentration, mg/L [*]	22.5	BOD ₅ concentration, mg/L ^{**}	28
TN Concentration, mg/L [*]	2	TN Concentration, mg/L ^{**}	21.64
TP Concentration, mg/L [*]	0.2	TP Concentration, mg/L ^{**}	4.97
Removal efficiency of silt traps ^{***}	20%	-	-

After Development							Before Development						
Location	Catchment Area, km ² ^{###}	Runoff Coefficient	Average Daily Runoff (m ³ /day) #	Pollution Loading, Kg/day			Location	Catchment Area, km ² ^{@@}	Runoff Coefficient	Average Daily Runoff (m ³ /day) #	Pollution Loading, Kg/day		
				BOD ₅	TN	TP					BOD ₅	TN	TP
Residential Buildings' Footprint ^{###}	0.0064	0.8	19.56	0.00	0.00	0.00	Unpaved Area	0.0064	0.2	4.89	0.14	0.11	0.02
Other Paved Areas	0.0098	0.8	29.80	0.54	0.05	0.00	Unpaved Area	0.0098	0.2	7.45	0.21	0.16	0.04
Unpaved Area [@]	0.0272	0.2	20.62	0.37	0.03	0.00	Unpaved Area	0.0272	0.2	20.62	0.58	0.45	0.10
Total	0.0434		69.98	0.91	0.08	0.01		0.0434		32.96	0.92	0.71	0.16
Change in Pollution Loading (After Development - Before Development)				(0.02)	(0.63)	(0.16)							

Remark:

Estimated Average daily runoff based on the proposed development provided by the Engineer.

According to "Stormwater Drainage Manual, annual rainfall in Hong Kong is around 2200mm. However, according to the report on "Update on Cumulative Water Quality and Hydrological Effect of Coastal Developments and Upgrading of Assessment Tool", only rainfall events of sufficient intensity and volume would give rise to runoff. It indicated that runoff percentage for the wet season is about 82% while dry season is only 44%. Therefore, only rainfall of $2200 \times (82\% + 44\%) / 2 = 1386\text{mm}$ can be generated into runoff and is adopted in this Study.

The proposed development is for small house development, it is expected that there will be no major pollution runoff from the residential building roof.

@ Unpaved area including proposed landscaping area/ buffer planting and private gardens at residential portion. It is expected that the private gardens will be vegetated and unpaved.

@@ Catchment area of the whole developable area (i.e. the residential portion) in the absence of the proposed development. The developable area before the development, is dry agriculture land.

* According to the report "EPD, Update on Cumulative Water Quality and Hydrological Effect of Coastal Developments and Upgrading of Assessment Tool-Pollution Loading Inventory Report". The same source of information was also adopted in the calculation of pollution loading due to stormwater during operational phase approved EIA report for "Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation", Appendix 5-2.

** The Project Site is currently agricultural land, the pollution loading is based on average value for agriculture use published in the "Water and Science Technology" journal (Li HE, Lee JH, Koenig A, Jayawardena AW (2005), University of Hong Kong, "Nutrient load estimation in nonpoint source pollution of Hong Kong region", Water and Science Technology, 2005; Vol 51 No 3-4, pp 209 - 216)

*** As silt traps will be implemented, 20% of removal efficiency of silt traps is assumed in this Study. The same source of information was also adopted in the calculation of pollution loading due to stormwater during operational phase approved EIA report for "Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation", Appendix 5-2.

Appendix 5-2B Estimation on the Increase of Surface Runoff Due to Nearby Development Projects

Development Project	Catchment Area, ha	Estimated Increase in Surface Runoff, m³/day
This Project Site * & #	4.3	37.0
Planned "REC Site" **	9	77.4
Planned "RD Site" **	6.6	56.8
Planned Kam Pok Road Site" **	3.7	31.8
Total		203.1 m ³ /day
Total		2.4 L/s

Remark:

* Based on the catchment area of the developable area presented in Appendix 5-2A.

** Based on the total development site area reported in the approved EIA report for the planned "REC Site". For planned "RD Site" and "Kam Pok Road Site", the total site area refers to those in the approved planning application under A/YL-MP/205 and A/YL-MP/202, respectively. Changing from unpaved area to paved area for the whole development site area, has been assumed in this estimation as a conservative approach.

Estimated increase in surface runoff (37 m³/day) due to the developable area (changing from unpaved area to paved area) as presented in Appendix 5-2A (i.e. the difference between the daily runoff before and after the development).