

Appendix 5L – Loading Calculation for TSTP

1. According to Table 5.12 in Chapter 5 of EIA report, the baseline effluent discharge concentration is extracted in Table 1.1 below:

Table 1.1 Baseline Concentration of Effluent Discharged from Existing STKSTW

Parameters	Unit	Baseline (mean)
Flow	m ³ /s	0.0192
BOD ₅	mg/L	10
SS	mg/L	15
TN	mg/L	22
Total Phosphate	mg/L	4
<i>E. Coli</i>	count/100mL	1500*

Note: For *E.coli*, the number indicates the 95%ile value.

2. As Moving Bed Biofilm Reactor (MBBR) process would be adopted for the TSTP, which has enhanced removal of BOD₅, SS and *E. Coli* compared to the existing STKSTW treatment process, together with a suitably designed additional CEPT process using ferric chloride or alum dosing to the influent for extra solids/pollutants removal, further reduction in TN and TP loads in the effluent of the TSTP will be effected. This will enable the TSTP to discharge the same total effluent pollutants loadings upon incoming flow increase up to 2,500 m³/d.
3. The dosing of the required chemical would be well controlled so that no residual chemical would remain in the effluent. In addition, the resulting chemically conditioned biodegradable particulate organic nitrogen and orthophosphate precipitates would be suitably captured and removed as sludge and then disposed of properly.
4. By adopting a suitably designed extra CEPT process, when the incoming flow build-up exceeds the existing plant design flow up to 2,500 m³/d, the TSTP will still be able to keep its total effluent pollutants loads. The proposed effluent quality with the corresponding calculated pollution loading for the existing STKSTW and TSTP are provided in Table 1.2 below.

Table 1.2 Flow, Average Pollutant Concentration and Loading of Effluent Discharged from the Existing STKSTW and the Proposed TSTP

Parameters	Unit		Existing STKSTW		TSTP	
	Concentration	Loading	Concentration	Loading	Concentration	Loading
Flow	m ³ /s		0.0192		0.0289	
BOD ₅	mg/L	g/day	10	16600	6.5	16250
SS	mg/L	g/day	15	24900	9.5	23750
TN	mg/L	g/day	22	36520	14.5	36250
Total Phosphate	mg/L	g/day	4	6640	2.5	6250
<i>E. coli</i>	count/100mL	count/day	1500	2.94 × 10 ⁹	996	2.94 × 10 ⁹

Note:

(1) For *E. coli*, the values provided are 95%ile values.

(2) The values in this table are calculated based on the mean quality of effluent from the plants. Therefore the values would be different from the similar loading calculation in Table 5.20 in the EIA Report, which adopts maximum effluent concentration limits for the purpose of conservative modelling assessment.