CHAPTER FIVE WATER AND SEWAGE

1. In the 1980's it was recognised that marine and beach water quality were in decline, and that the assimilative capacities of certain water bodies were under great stress due to the dependence upon the marine environment for the treatment and disposal of industrial and domestic effluent. As a result, the Government commissioned the Sewage Strategy Study (SSS) which essentially formulated a plan of action for the territory as a whole with SMPs produced for individual districts. The SMP's were developed to provide the way forward in terms of "first aid" measures to remedy relatively simple problems quickly, followed by staged development or upgrading of collection, treatment and disposal mechanisms for effluent in individual areas.

2. The three key aims of the SSS were to enhance the planning process, to improve legislative control of effluent discharges and to recommend methods for improving the collection and treatment facilities. The first of these is fundamental to the TDS Review process, while the second goal has been achieved through the strengthening of the Water Pollution Control Ordinance (WPCO) through the Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters. The third aim is espoused in the SMP's for each of the delineated catchments.

3. The Strategic Sewage Disposal Scheme (SSDS) originated from the SSS and is a complex development scheme which is currently being implemented in phases. The first phase comprises the collection of effluent from Kowloon and east Hong Kong Island via a collection system, in deep tunnel, which will convey the waste to Stonecutters Island where Chemically Enhanced Primary Treatment will be provided. Under Stage I, effluent will be discharged via a 1.6km interim outfall with ultimate discharge under Stage II of the Scheme via an oceanic outfall. The point of discharge will be determined in the Stage II EIA Study which has just been commissioned.

4. One of the water quality sub-objectives required the minimisation of coastal pollution according to the Water Quality Objectives defined by the WPCO. While this is fully supported, it has been noted in previous rounds of assessments of the TDS Review that there is presently no mechanism for such an assessment within the constraints of this Strategic Study. Water bodies which are particularly sensitive to development pressures include Deep Bay, Mirs Bay and Tolo Harbour. The Northern Western Water Control Zone is also affected by the massive influences of pollution discharging into these waters from the catchment of the PRD.

5. One of the objectives of the TDS Review was to identify areas where constraints may be placed on existing and planned infrastructure due to development proposals at the different time horizons being considered. This is particularly pertinent as it could have a direct impact on the implementation and phasing of the SMPs. This is also a significant issue as it relates to direct environmental costs associated with the development strategies and thus contributes to the overall assessment of their economic feasibility.

6. The policy objectives laid down in the White Paper for Planning and the Environment include :

(i) to minimise adverse environmental effects by ensuring the consequences for the environment are properly taken into account in site selection, planning and design of all new development. Although the development threshold previously proposed is forecast to be exceeded the opportunity exists in the NWNT to provide a sub-regional collection system with centralised treatment facilities as there are not the same land constraints as in for example the Metro Area (nb San Wai is not constrained and could be upgraded as part of such a scheme).

(ii) to seize opportunities for environmental improvement as they arise in the course of urban redevelopment. This is being espoused by the fundamental aim of the development strategies in which the collection, treatment and disposal of industrial and domestic effluent is being given primary consideration; and

(iii) to safeguard urban encroachment into rural areas unless adequate services have been provided. This is a basic tenet of the development controls which was applied to the SENT in connection with the protection of receiving water quality.

7. With these principles in mind, the NT-Biased, HB-Biased and Recommended Options have been further considered and, using the rapid assessment method adopted under the SSS for estimating effluent flow rates, the implications on placed infrastructure were broadly assessed. An estimate of the effluent flows due to the distribution of domestic population are given in Table 5.1.

Table 5.1 Domestic Effluent Flows Generated at 2006 (Mm^3/day)

	NT-Biased Option	Harbour-Biased Option	Recommended Strategy
METRO	0.822	0.879	0.852
NT	0.658	0.602	0.628
NWNT	0.275	0.254	0.262
NENT	0.234	0.220	0.222
SWNT	0.050	0.028	0.044
SENT	0.099	0.099	0.099

8. From the data given in Table 5.1 above it is apparent that the recommended strategy balances the demand for effluent treatment better than the NT-Biased option. The greatest flows are generated, not unexpectedly in the Metro Area, under the HB-Biased Option, however this implies that the SSDS Stage II system may need to be advanced. The option which gives greatest cause for concern with respect to the timely provision of adequate infrastructure is the NT-Biased Option as there are ramifications on the SWNT and the NWNT.

9. The focus of reclamation in the HB-Biased Option and the dredging and disposal of mud which could be required, are likely to cause relatively greater concerns than for the NT-Biased or Recommended Medium-Term Strategy. The EPD Technical Circular No TC1-1-92 is used to define the degree of contamination of marine deposits and places restrictions on dredging and disposal methods. Options to minimise the disposal requirements for any project, which involves the dredging of contaminated mud could include partial dredging, fully drained reclamation or deep chemical mixing. All options should be considered to minimise disposal volumes.

10. In this connection, it is also worthy to note that there is an ongoing study which includes monitoring of the effects of disposing of contaminated mud at the East Sha Chau Mud Pits with particular reference to the effects on marine ecology. Furthermore, the ecological impacts associated with the winning of marine sources of fill also need to be comprehensively addressed as these can have similarly devastating impacts on the marine life in the area.