

4. WATER QUALITY

4.1 Introduction

- 4.1.1 It is considered that only site audits are required to ensure proper implementation, functioning and maintenance of the recommended water pollution mitigation measures at the work site during construction and operation phase. ET leader should design the implementation status sheet to check the performance of the contractor regularly. Contractor is obligated to ensure all kinds of site runoff, discharge effluents to sewers are in compliance with the statutory limits set out in the relevant Water Pollution Control Ordinance especially WQOs for the Victoria Harbour Phase II and Tolo Harbour and Channel WCZs and *Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters*.

4.2 Water Quality Mitigation Measures

- 4.2.1 The EIA report has recommended water quality control and mitigation measures. The Contractor shall be responsible for the design and implementation of these measures.

During Construction Phase

- 4.2.2 To prevent high loading of SS from entering the Victoria Harbour and Tolo Harbour and Channel WCZs causing impacts on the identified WSRs, proper site management is essential to minimise surface water runoff, soil erosion and sewage effluents.
- 4.2.3 The control of construction site runoff and drainage should be prevented or minimised in accordance with the guidelines stipulated in the EPD's *Practice Note for Professional Persons, Construction Site Drainage* (ProPECC PN 1/94). Good housekeeping and storm water best management practices (BMPs), detailed as follows, should be implemented to ensure that runoff from construction areas and any stored excavated material comply with the WPCO and no unacceptable impact on the WSRs arises due to the construction of the proposed Route 16 Alternative Alignment. All discharges from the construction site should be controlled in order to comply with the standards for effluents discharged into the Victoria Harbour and Tolo Harbour and Channel WCZs under the TM.

Construction Runoff and Drainage

- 4.2.4 Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with tunnelling work and above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include:
- the use of sediment traps; and
 - the adequate maintenance of drainage systems to prevent flooding and overflow.
- 4.2.5 The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates.
- 4.2.6 All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment traps should be regularly cleaned and maintained. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.

- 4.2.7 Sand and silt in the wash water from the wheel washing facilities, which ensure no earth, mud and debris is deposited on roads, should be settled out and removed before discharging into storm drains. A section of the road between the wheel washing bay and the public road should be paved with backfill to prevent wash water or other site runoff from entering public road drains.
- 4.2.8 Oil interceptors should be provided in the drainage system and regularly emptied to prevent the release of oils and grease into the storm water drainage system after accidental spillage. The interceptor should have a bypass to prevent flushing during periods of heavy rain.

Tunnelling Work

- 4.2.9 Temporary open storage of excavated materials should be covered with tarpaulin or similar fabric during rainstorms. Any washout of construction or excavated materials from the drill-and-blast tunnelling work should be diverted to the drainage system via appropriate sediment traps.
- 4.2.10 Ground water pumped out of tunnels should be discharged into the drainage channels which incorporate sediment traps to enhance deposition rates and to remove silt.
- 4.2.11 Spent grouts used in diaphragm wall construction should be collected in a separate slurry collection system, reconditioned and reused wherever practicable. The disposal of used grouting materials will only be permitted if it is treated to the TM standards before discharge to the storm drains or disposal to landfill.

General Construction Activities

- 4.2.12 Debris and rubbish on site should be collected, handled and disposed of properly to avoid entering the water column and cause water quality impacts. The solid waste management requirement on site to prevent such impacts.
- 4.2.13 All fuel tanks and storage areas will be provided with locks and be located on sealed areas (within bunds of a capacity equal to 110% of the storage capacity of the largest tank or 20% by volume of the fuel stored in that area, whichever is the greatest) to prevent spilled fuel oils from reaching coastal waters of the Victoria Harbour and Tolo Harbour and Channel WCZs.

Sewage Effluent

- 4.2.14 Construction work force sewage discharges from fixed toilet facilities on-site should be connected to the nearby existing trunk sewer wherever feasible. However, for areas where existing trunk sewer is not available, it is recommended that appropriate and adequate on-site portable chemical toilets should be provided by a licensed contractor who will be responsible for appropriate disposal and maintenance of these facilities.
- 4.2.15 In addition, it is considered that sewage discharges could also be treated by on-site septic tanks and soakaway. Minimum clearance away from streams and catchments and other requirements for the proposed septic tank and soakaway should be referred to EPD's Practice Note for Professional Persons, Drainage Plans.

During Operation Phase

- 4.2.16 It is important that appropriate measures are implemented to control road runoff and domestic sewage effluents entering the Victoria Harbour and Tolo Harbour and abate the impacts on the identified WSRs. The recommended mitigation measures are:
- Sewage effluents generated at Toll Plaza will be treated at the on-site septic tanks.

- Septic tanks should be located far away from the streams and catchment wherever possible.
- Adequate clearance and maintenance should be undertaken to ensure proper functioning of the tanks without polluting any streams and watercourses nearby.

4.2.17 Details are depicted in the Implementation Schedule in Section 9

4.2.18 If the above measures are not sufficient to restore the water quality to an acceptable levels upon the advice of the ET Leader, the Contractor shall liaise with the ET Leader on some other mitigation measures, propose to IC(E) and ER for approval, and carry out the mitigation measures.

4.3 Site Inspection

4.3.1 The site inspections and the document review procedures are mentioned in Sections 7.1 and 7.2 of this manual, the ET Leader shall pay special attention to the issues relating to water quality, and check whether the Contractor has followed the recommended mitigation measures and the relevant legislation and guidelines.