

For Information

**Legislative Council
Panel on Environmental Affairs**

**Supplementary Information on
Odour Problem and Polluted Seabed at Tsuen Wan Water-front**

PURPOSE

In response to a request by members at the EA Panel meeting on 15 December 2008, this paper provides the background of the odour problem along Tsuen Wan water-front and the written response on the measures to be taken to deal with the problem of polluted seabed near Tsuen Wan.

THE ADMINISTRATION'S RESPONSE

The Odour Problem and the Polluted Seabed near Tsuen Wan

2. The odour problem at Tsuen Wan Bay water-front area has been the subject of concern of the members of the Tsuen Wan District Council (TWDC) for a number of years and was thought to be related to the poor quality of water and sediment along Rambler Channel. The subject has been discussed on several occasions by the Environmental and Health Affairs Committee of the TWDC since mid-2000s. In 2005, the Administration has organized an inter-departmental working group under the TWDC, involving the Environmental Protection Department (EPD), Drainage Services Department (DSD), Buildings Department (BD), Food and Environmental Hygiene Department (FEHD) and Highways Department (HyD) to investigate this issue. **Annex 1** shows the locations of the seafront and the four major stormwater box culverts.

3. The seabed sediment in Tsuen Wan Bay has once been implicated as the source of the malodour at the water-front. However, a detailed analysis carried out by the Administration in 2005 revealed that the marine environment of the constantly submerged Tsuen Wan Bay seabed sediments could not have emitted or promoted the generation of odorous gases. This finding was further

supported by the EPD's marine monitoring data. From 2002 to 2008, the monitoring data on dissolved oxygen (DO) levels show that the sea bottom in Tsuen Wan Bay was rarely completely devoid of oxygen and would not have favoured the formation of obnoxious gas in the seabed sediment, particularly since the commissioning of the Harbour Area Treatment Scheme (HATS) Stage 1 in December 2001. The above studies and monitoring data indicate that the odour problem in Tsuen Wan Bay water-front would not be resolved by simply covering or removing the near shore seabed sediment in Tsuen Wan Bay.

4. With regard to the seabed near Tsuen Wan, EPD has regularly monitored the sediment of Tsuen Wan Bay. The monitoring results indicate that both the levels of nutrients (as indicated by total phosphorus) and heavy metals (as indicated by the sum of the 8 metals measured) in the sediments have decreased by 21% and 16% respectively from 2001 to 2008. Nevertheless, the seabed sediment in the bay still contains relatively high level of heavy metals such as copper and silver. According to the 1993 study conducted by the Chinese University of Hong Kong¹, the metal-contaminated sediment in Tsuen Wan Bay seabed originated from the industrial areas of Tsuen Wan and dredging was thus not recommended as this would greatly disturb the seabed and release the pollutants. Once disturbed, the tidal current could disperse the suspended pollutants towards Victoria Harbour as well as the bathing beaches along Castle Peak Road, thus posing greater threat to other water bodies at and near Tsuen Wan. In this case where the marine sediment and waters of the Bay are already showing signs of assimilating the pollutants naturally, a better way to facilitate the gradual recovery of the Bay's marine ecosystem should be to leave the seabed sediment undisturbed while continuing to control the pollution at source.

5. Subsequently, the investigations by the Administration revealed that the odour problem was most likely due to the continuous discharge of polluted effluent through the storm culverts into Tsuen Wan Bay. Such polluted effluent could also result in debris, foul sediments and stagnant waters being accumulated inside the major box culverts. Malodour was generated by the decaying organic materials that deposited as sediments inside the culverts, and released through openings, manholes and outfalls when the sediments were exposed, especially under low tide conditions.

¹ The Centre of Environmental Studies of the CUHK was employed by the TWDC in 1993 to carry out a study on the pollution of marine water and sediments in Tsuen Wan Bay to assess the extent of pollution in the bay and to recommend improvement measures.

Remedial measures taken

6. Since 2004, various government departments have been working closely together to implement a series of remedial measures aiming at rectifying the pollution problem and alleviating the malodour issue in Tsuen Wan Bay water-front area. Reducing pollution discharges into the marine waters is essential to facilitate the gradual recovery of the marine ecosystem. Initially, the Administration had considered adopting a bioremediation odour-suppression approach at Tsuen Wan Bay similar to that applied to Shing Mun River (SMR) and the approach channel of Kai Tak Nullah (KTN). However, the approach is considered not feasible for the box culverts or the shallow areas of Tsuen Wan Bay because -

- (a) the confined space of the box culverts could not accommodate the deployment of the bulky equipment needed to inject high concentrations of calcium nitrate into the sediments;
- (b) the water depth inside the box culverts could rarely meet the minimum required level of 1.2 m or more in order to reach an optimal odour removal efficiency of the bioremediation approach; and
- (c) the high flow rate of the well flushed Rambler Channel would greatly reduce the retention time and effectiveness of the calcium nitrate if applied in Tsuen Wan Bay as compared to the relatively slow flowing SMR and KTN sites.

7. The Administration has implemented regular maintenance programmes of CCTV inspections and desilting work inside the box culverts at Tai Chung Road, Tai Ho Road and Ma Tau Pa Road. Cleansing with high pressure water jet was also carried out in March 2005 when a complaint of bad smell was received. In 2005, the Administration manually removed some 300 cubic metres of sediments inside the Ma Tau Pa Box Culverts through a special project and rectified a major leakage in the public trunk sewer located off Chelsea Court. The measures were effective in intercepting polluted effluents from entering into the culverts and abating the odour in the water-front area. The number of odour complaints decreased sharply thereafter. At present, no malodour from the box culverts is detectable at Riviera Gardens.

8. In addition to the removal of polluted sediment and debris from the box culverts, the Administration has also stepped up efforts to stop the continual discharge of foul effluent into Tsuen Wan Bay via the local storm drainage system. Sewer connection projects have been carried out for villages in the vicinity of Tsuen Wan and Sham Tseng areas since 2001 and are expected to be completed by 2009. Also, after the full commissioning of HATS Stage 1 in December 2001, the coarsely screened sewage from the catchments of Tsuen Wan and Kwai Tsing that was originally discharged directly into the Rambler Channel was intercepted and conveyed to the sewage treatment works at Stonecutters Island for proper treatment. As a result, there has been a significant reduction of organic pollution in Tsuen Wan Bay. The water quality of Tsuen Wan Bay has shown improvement as observed from the monitoring results. There has been 11% increase in DO level, 11% decrease in 5-day biochemical oxygen demand, and 5 to 7% decrease in ammonia-nitrogen concentration.

9. To control discharges from misconnections and expedient connections, the Administration has been striving to identify the sources of the foul water discharged into the local storm drain system, to rectify the misconnections and to take enforcement actions against illegal dischargers. Steady progress is being made.

10. During the “Team Clean Campaign” from 2003 to 2005, the Administration further stepped up its efforts to identify and remove major building expedient connections in the Tsuen Wan area. An inter-departmental working group was organized to meet regularly to exchange information and to deal with the expedient connections and misconnections found in public and private sewers and the defects of public sewers and related problems. From 2006 to 2008, 21 building expedient connections in the area were found and rectified. As a result of joint departmental efforts, the number of related odour complaints was reduced from 71 in 2005 to 2 in 2008. A set of photographs of Tsuen Wan Bay before and after the public sewer rectification in 2005 is attached at **Annex 2** for reference.

Current measures to control odour at Tsuen Wan water-front

11. In order to further reduce misconnections and expedient connections to public sewers from buildings in Tsuen Wan and to deter new illegal connections, the Administration is taking intensive measures such as enhancing inspections of building terminal manholes and checking for defects in the public sewerage system. Depending on the type of defects identified, remedial actions will be taken by the appropriate department(s) to rectify the situation. Moreover, under the Coordinated Maintenance of Buildings Schemes (CMBS), the Administration has compiled a list of Target Buildings (TB) in Tsuen Wan District and will step up investigation and inspection work at those buildings suspected with expedient connections. The assistance and support of the Hong Kong Housing Society will be sought for any required rectification works. In the meantime, the Administration will continue to take enforcement actions against offenders illegally discharging polluted matters into storm drains spotted during inspections.

12. For the maintenance of the public sewerage system, the Administration would conduct regular maintenance de-silting and cleaning of the storm water box culverts and seawall outfalls in the Tsuen Wan water-front area. In early January 2009, a Works Order has been issued to conduct a walk through inspection for Tai Chung Road box culvert for routine maintenance purposes. In parallel, the Administration will attempt to expedite the village sewerage projects in the vicinities of Tsuen Wan and Sham Tseng areas to reduce pollution load in the local storm drain systems.

13. To contribute to resolving the odour problem, the Administration is conducting a review of the West Kowloon and Tsuen Wan Sewerage Master Plans (SMPs) to address the remaining sewerage issues. The main objective of the study is to develop a new SMP for the provision of adequate sewerage, sewage treatment and disposal facilities to cope with future requirements. The study will also investigate the water pollution problems in the existing storm drainage system. Should the study identify any obvious pollution problems, the information will be shared among members of the inter-departmental working group and the problems will be followed up by the appropriate department(s). In addition, the SMP consultant will also examine the feasibility of longer term options to control and reduce the odour problem caused by discharging of foul effluent into storm drains via expedient

connections and ultimately into Tsuen Wan water-front area. This study commenced in February 2007 and will be completed by August 2009.

14. In conclusion, the Administration has taken a series of measures to tackle the problems at sources near Tsuen Wan sea-front to reduce malodour and will continue to step up the efforts to address the environmental issues through enforcement, maintenance of drains and sewerage works with a view to improving the environment at Tsuen Wan water-front.

Environmental Protection Department
Drainage Services Department
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Legend:  Outfall of major stormwater box culvert

Locations of the four major storm water box culvert outfalls at Tsuen Wan water-front

Before rectification in April 2005



After rectification in July 2006



Photos of Tsuen Wan Bay before (left) and after (right) the public sewer rectification