33/F, Revenue Tower, 5 Gloucester Road, Wan Chai, Hong Kong
香港灣仔告士打道 5 號稅務大樓 33 樓

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Further Enhancing Coastal Water Quality of Victoria Harbour

PURPOSE

This paper seeks Members' views on the proposal to give priority to tackle near shore water pollution problems of Victoria Harbour. The Environmental Protection Department (EPD) plans to commission a consultancy study to further enhance the quality of coastal waters of Victoria Harbour.

BACKGROUND

2. The Government has been implementing the Harbour Area Treatment Scheme (HATS) in phases since 1994 for the collection and proper treatment of sewage generated from both sides of Victoria Harbour. HATS Stage 1 delivers sewage collected from Kowloon and north-eastern Hong Kong Island via deep sewage tunnels to the Stonecutters Island sewage treatment works (SCISTW) for chemically-enhanced primary treatment (CEPT), removing 70% of the organic pollutants in terms of biochemical oxygen demand; 80% of the suspended solids and 50% of sewage bacteria, *E.coli*. HATS Stage 1 was commissioned in 2001 and has significantly improved the water quality of Victoria Harbour.

3. Construction of HATS Stage 2A is underway to collect sewage generated from the northern and south-western parts of Hong Kong Island with newly constructed deep tunnels of 21 kilometres long. The sewage

will then be transferred to the expanded SCISTW for CEPT and disinfection. The Advance Disinfection Facilities under HATS Stage 2A were commissioned in March 2010 to remove at least 99.9 per cent of *E.Coli* from the treated effluent of the SCISTW. Since then, the bacteria level in the western part of Victoria Harbour has been largely reduced [1]. Major works under Stage 2A is expected to be completed by end of this year. Upon the full commissioning of Stage 2A, the overall water quality of Victoria Harbour will be further improved.

HATS 2B REVIEW

4. EPD commissioned a consultancy study to review the implementation of HATS Stage 2B (the HATS Stage 2B Review) in June 2010. The design of HATS Stage 2B is to provide for an underground biological treatment facility adjacent to the existing SCISTW to provide secondary sewage treatment. The HATS Stage 2B Review reveals that HATS Stage 2A has already provided adequate capacity to handle the projected sewage flow built-up and the bulk of Victoria Harbour will be in compliance with the Water Quality Objectives (WQOs) upon its commissioning while the upgrading of the SCISTW treatment level from CEPT to biological treatment will not result in an observable improvement of the water quality of coastal waters. The HATS Stage 2B Review thus concludes that in terms of WQO compliance, the implementation of HATS Stage 2B at this stage is not critical. The relevant findings and recommendations are summarized in **Enclosure 1**.

5. Though the water quality benefits are marginal, HATS Stage 2B will require substantial investment (both in terms of capital and operating costs). It is more effective to give priority to deploying resources to tackle near shore pollution, with water quality of the urban coastal waters an increasing concern of the local community. The implementation of HATS Stage 2B will be kept under review taking into account the water

[1] With the full commissioning of the Advance Disinfection Facilities from March 2010, water quality at seven beaches in Tsuen Wan District has seen significant improvement such that all of them have become suitable for swimming and re-opened in phases. Approach Beach, Casam Beach, Hoi Mei Wan Beach and Lido Beach have been re-opened since June 2011, while Anglers' Beach and Ting Kau Beach have also been re-opened since September 2013 and April 2014 respectively. Regarding Gemini Beaches, toilets and barbecue facilities are provided since April 2014, but there are no lifeguard services.

quality situation and the latest technological development in biological treatment.

6. With the development of new waterfront promenades on both sides, Victoria Harbour has become increasingly accessible to the public. Public aspiration for a pleasant harbourfront will only increase. Hence it is necessary to find a more effective solution to enhance the quality of the coastal waters of Victoria Harbour, which will improve the associated aesthetic and odour problems of the near shore areas. The 2014 Policy Address has also proposed to enhance water quality of the coastal areas of Victoria Harbour.

QUALITY OF COASTAL WATERS REMAINS A CONCERN

7. HATS Stages 1 and 2A will have improved the main water body of Victoria Harbour. However, there are still residual pollution discharges from a number of activities in densely populated urban areas into the coastal waters. These discharges originate from various pollution sources, including overland polluted storm water flow [2] and wastewater from mis-connections, causing odour and visual problems along the coastal areas of Victoria Harbour. Other possible sources of odour include marine refuse, grease and oil at sea, decaying algae, sediments and deposit at drainage outlets, seabed sediments. These problems remain subjects of concerns by the local community.

8. At present, a multi-pronged approach has been adopted by various departments concerned to deal with near shore pollution problems. For example, EPD takes enforcement actions to stop illegal discharge from building drains to public storm drains, and will request the Buildings Department to step in if necessary; the Food and Environmental Hygiene Department takes enforcement actions against food premises conducting scullery activities at rear lanes; the Drainage Services Department replaces broken sewers, rectifies wrong connections between public sewers and storm drains, desilts storm drains and culvert outlets as well as upgrades or installs dry weather flow interceptors (DWFIs) [3].

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[2] The pollution is caused by a number of activities such as roadside shops/business operators and littering.

[3] Dry weather flow interceptors (DWFIs) are devices used during the dry season to intercept and divert polluted stormwater in the storm drains or nullahs to the sewerage system. In the rainy season, with higher water flow, stormwater mostly bypass the DWFIs and discharge through the stormwater drains. In general, DWFIs will be disabled during the rainy season.

9. Despite the concerted efforts of the departments, it is difficult to eliminate the problem of mis-connections and malpractices, particularly in densely populated areas with many old private buildings. Furthermore, albeit resource intensive, enforcement actions are unable to comprehensively prevent the various daily activities in the streets from polluting the coastal waters. Desilting and DWFIs at drainage outlets are only ad hoc mitigation measures. Besides, the installation of DWFIs is subject to the space constraint at strategic locations. Therefore, to improve near shore water quality, investigation in many aspects is necessary so that effective programmes can be developed to tackle the pollution at source.

PROPOSAL

10. As there are diverse sources of near shore pollution, how odour is generated is a complicated matter. Nuisance caused by odour also varies with seasons, weather conditions, wind directions, wind speeds and water current. In particular, odour problem is often found to be more severe in semi-enclosed water bodies such as typhoon shelters. A range of solutions are required to tackle the issues. To develop effective improvement measures, we need to identify the specific causes of near shore pollution through evidence-based reviews and various analyses, aiming to achieve the following objectives:

(a) to explore various practicable options to effectively reduce near shore water pollution to improve the overall environment of both sides of Victoria Harbour (both aesthetic and odour) with the long-term objective of enhancing the leisure and amenity value of the coastal areas of Victoria Harbour; and

(b) to work out a programme to improve the environment of our popular waterfront areas.

11. To achieve the above objectives, the proposed consultancy study will identify specific solutions through prevention at source and pollution control measures. The following tasks are proposed for the consultancy study:

(a) to carry out initial baseline survey to establish overall conditions of near shore pollution levels in Victoria Harbour;

(b) to review overseas experience in combating near shore water pollution that may be applicable to Victoria Harbour;

(c) to identify priority areas for improvement;

(d) to carry out evidence-based reviews to identify pollution sources affecting regional coastal waters, e.g., expedient connection survey, non-point source pollution survey, etc.;

(e) to carry out regional environmental investigation to assess the nuisance such as aesthetic and odour arising from the near shore water pollution;

(f) to review the current programmes, legislative provisions and institutional arrangements to combat near shore water pollution;

(g) to study practicable measures to prevent pollution at source (e.g. rectify any wrong connections in the public sewer and drainage systems, land use planning, legislative provision to increase enforcement efficacy, etc.) and to reduce pollution discharges with pollution control measures (e.g. engineering solutions, clean up actions, etc.); and

(h) to draw up recommendations and timetable to enhance the water quality of Victoria Harbour, in particular the priority areas and areas of concern of the local community [4], and in the long term its leisure and amenity value.

12. An initial baseline survey will be carried out in the consultancy study to establish overall conditions of near shore water pollution levels in Victoria Harbour. Evidence-based reviews and environmental investigations will examine regional pollution problems. To cope with developments on both sides of the Victoria Harbour, we have considered the factors below and propose West Kowloon, Kowloon East, the New Central Harbourfront and Wan Chai / Causeway Bay as priority areas for improvement:

(i) accessibility of waterfront areas;

[4] Areas of concern of the local community shall be confirmed through consultation with the relevant District Councils / stakeholders.

(ii) current uses and popularity of waterfront areas;

(iii) developments with planned timetable along the waterfront areas;

(iv) on-going or planned improvement works in the waterfront areas; and

(v) pollution level of coastal waters.

13. For pollution black spots in priority areas, we will carry out evidence-based reviews (e.g. walkover survey, water quality monitoring of storm drain system, expedient connection surveys, manhole inspection, non-point source pollution surveys etc.) and environmental investigation (e.g. olfactometry odour assessment, headspace analysis, sediment analysis, etc.) to identify the specific sources of near shore pollution.

14. In addition to detailed analysis of the specific causes of near shore pollution, we will also review existing measures in tackling near shore pollution as well as overseas experience. With an evaluation of the likely public reaction, preliminary environmental, traffic and drainage impacts, as well as sustainability, cost effectiveness and implementation timetable, we hope to recommend for example:

(a) practicable solutions with tentative timetable;

(b) suggestions on how to coordinate with ongoing improvement works at the waterfront areas;

(c) best practices or protocols;

(d) pilot demonstration scheme; and

(e) long-term options.

15. Inspection audits (e.g. field inspections, odour patrols, expedient connection surveys, etc.) will be carried out under the consultancy study to investigate areas with serious near shore water pollution problems. Preliminary proposal on mitigation measures based on findings of inspection audits will be passed to relevant departments for follow up actions.

16. The removal of aesthetic and odour problems is our main target in enhancing quality of the coastal waters. To evaluate the effectiveness of various solutions, the consultancy study will examine objective indicators of water quality (See **Enclosure 2**), beneficial uses of water bodies, overseas experience and international standards, etc.

17. We have already started consultation with relevant experts and bodies on the scope of the consultancy study. After consulting the Advisory Council on the Environment, District Councils and other stakeholders, we will prepare the detailed scope and requirements of the consultancy study for consultation of the Panel on Environmental Affairs and funding application to the Finance Committee of the Legislative Council. Subject to approval of funds, we plan to commence the proposed 24-month consultancy study in 2015.

ADVICE SOUGHT

18. Members are invited to comment on the proposed objectives, scope, priority areas for improvement, preliminary practicable recommendations, objective indicators of nearshore water pollution, etc., of the consultancy study as given in paragraphs 10-16 above.

Environmental Protection Department
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