



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

**ACE Paper 15/2015**

***For discussion on 9 November 2015***

**Update on the implementation of  
Harbour Area Treatment Scheme Stage 2A**

**PURPOSE**

This paper reports to Members the latest progress of the implementation of Harbour Area Treatment Scheme (HATS) Stage 2A.

**BACKGROUND**

2. HATS is a major investment of the Government to improve the water quality of Victoria Harbour. It is an integrated sewerage system for the efficient and effective collection and treatment of sewage generated around Victoria Harbour. The Government has been implementing HATS in phases since 1994.

3. HATS Stage 1 construction commenced in early 1995 and was completed at the end of 2001. Sewage from Tsuen Wan, Kwai Tsing, Tseung Kwan O, the urban areas of Kowloon and northeastern Hong Kong is collected and treated at the Stonecutters Island Sewage Treatment Works (SCISTW) (**Annex 1**). HATS Stage 1 collects about 75% of the total sewage generated from the harbour catchment and conveys via deep tunnels to the SCISTW for centralised treatment before disposal. HATS Stage 1 has significantly improved the water quality of Victoria Harbour. After its commissioning in 2001, the average dissolved oxygen level in the harbour has increased by 10%. In addition, the levels of Un-ionised Ammonia and Total Inorganic Nitrogen have reduced by 31% and 16% respectively.

4. To bring about early improvements to the water quality of the western harbour and the beaches at Tsuen Wan before the collection and treatment of the remaining sewage generated from the harbour catchment (i.e. the northern and south-western parts of Hong Kong Island), the Advance Disinfection Facilities (ADF) under HATS Stage 2A were commissioned in March 2010. The ADF removes at least 99 per cent of *E. coli* from the treated effluent of the SCISTW. Since its commissioning, the bacteria level in the western part of Victoria Harbour

has been significantly reduced <sup>[1]</sup>.

## FEATURES OF HATS STAGE 2A

5. For the collection and treatment of the remaining sewage generated from the harbour catchment, HATS Stage 2A (**Annex 2**) comprises three major works components, namely –

- (a) the upgrading of eight preliminary treatment works (PTWs) at North Point, Wan Chai East, Central, Sandy Bay, Cyberport, Wah Fu, Aberdeen and Ap Lei Chau: The capacity and facilities need to be upgraded to cater for the technical requirements, such as removal of large solids and grits in sewage to avoid deposition in the deep tunnels and damage or blockage to downstream facilities. Green features such as green roofing, landscaping, etc., also form part of the upgrading works.
- (b) the construction of a network of tunnels: The construction of a 21-kilometre sewage tunnel with sections of depths varying from about 70 to 160 metres below sea level. Vertical shafts connected to the tunnels will collect sewage from the eight PTWs and convey it to the SCISTW. A drill-and-blast method has been adopted for shaft excavation works and deep tunnel construction.
- (c) the expansion of the SCISTW to increase its treatment capacity and to provide disinfection treatment facilities: The ADF will be replaced by the Final Disinfection Facilities. In order to treat the additional sewage from Stage 2A, expansion of treatment capacity of the SCISTW from 1.7 to 2.45 million m<sup>3</sup> per day is required. Also, upgrading of the sludge treatment, handling and disposal facilities, odour control system is necessary.

6. HATS is the largest sewerage infrastructure project in Hong Kong. Upon completion of HATS Stage 2A, the SCISTW will become the largest chemically-enhanced primary treatment plant in the world. Apart from further improvement in dissolved oxygen and nutrient levels, according to the modeling results of the HATS Stage 2A Environmental Impact Assessment, upon full commissioning, the *E. coli* level in the open water (main channel) areas of Victoria Harbour as a whole should gradually decrease to below 610 counts/100mL.

---

<sup>1</sup> With the full commissioning of the Advance Disinfection Facilities from March 2010, water quality at the seven beaches in Tsuen Wan District has seen significant improvement such that all of them have become suitable for swimming and were 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.

## **PROGRESS TO DATE**

7. Provision of covers and deodourisation facilities to sedimentation tanks at the SCISTW were completed in 2012 to improve the odour control system. To cope with the increased sewage flow, additional flocculation tanks, sedimentation tanks and new sludge treatment facilities have been constructed and put into operation in phases.

8. Since 24 September 2015, preliminarily-treated sewage from the eight PTWs is progressively diverted to the SCISTW for centralised treatment before discharge. The Wan Chai East PTW is the first plant to undergo the flow turning process (**Annex 3**), followed by the North Point PTW and Central PTW. With completion of the flow turning process of the three plants in September 2015, about 70% of the total flow from HATS Stage 2A has been intercepted instead of discharge into Victoria Harbour having only been preliminarily treated. The remaining five PTWs on the southwestern side of Hong Kong Island would complete the flow turning process by the end of November 2015. HATS Stage 2A will enter full operation this year.

9. Drainage Services Department will continue with the other upgrading measures for HATS Stage 2A to further enhance the reliability and stability of the system. These include the coupling of the interconnection tunnel between the new and old main pumping stations, construction of southern sludge cake silo, workshop building, and polymer storage building, all to provide added maintenance capability for the expanded SCISTW. Furthermore, various beautification and greening works will also be carried out. The remaining works are expected to be progressively completed by early 2017 (**Annex 4**).

## **CONSEQUENTIAL IMPROVEMENT IN WATER QUALITY**

10. Water samples collected in early October 2015 indicate that the water quality in the central Harbour has further improved after the diversion of discharges from the North Point, Wan Chai East and Central PTWs to the SCISTW in September 2015, with bacteria *E. coli* level generally decreased to below 610 counts/100mL. The bacterial (i.e., *E. coli*), biochemical oxygen demand (represents organic load) and ammonia-nitrogen (harmful to marine life) levels, as compared with those over the last 3 years, has reduced by over 80%, 50% and 15%, respectively.

## **WAY FORWARD**

11. Extensive post-commissioning monitoring will be continued to confirm the long-term trend of improvement upon the full operation of HATS Stage 2A.

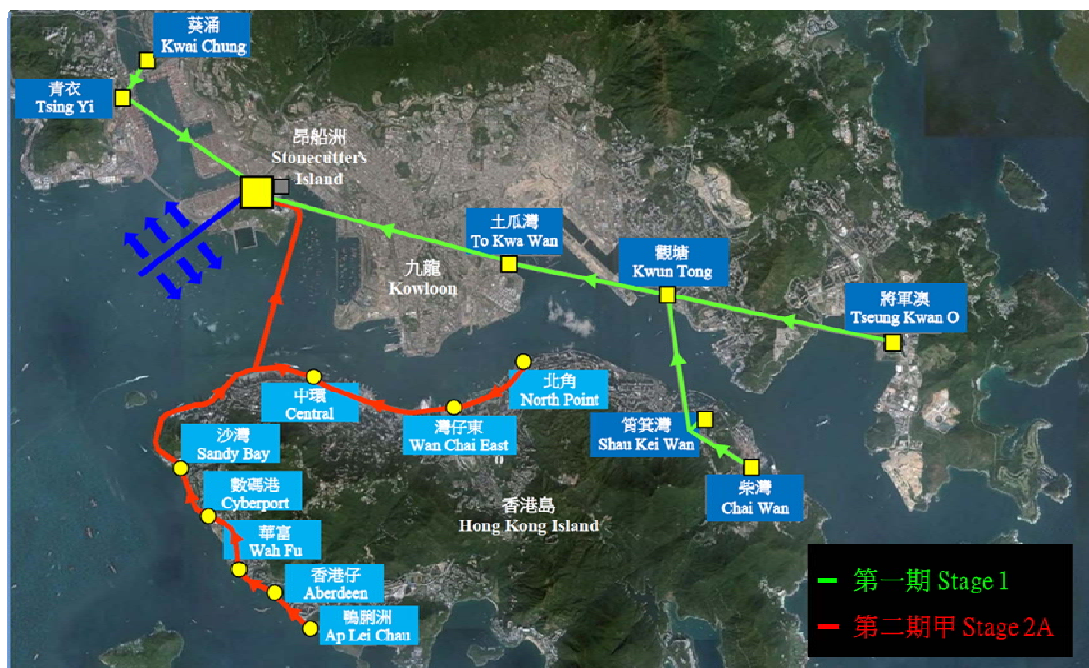
12. Upon completion of HATS Stage 2A, near shore pollution in Victoria Harbour will become our priority water quality issue. The Government will commission a study in early 2016 on how to improve the problem of pollution and odour nuisance caused by the discharge of urban residual pollutants into urban coastal waters. The long term objective is to enhance the leisure and recreational value of Victoria Harbour.

**Environmental Protection Department**  
**November 2015**

## Annex 1 – Diagram of HATS Stage 1



## Annex 2 – Diagram of HATS Stage 2A





### Annex 3 – Flow turning at Wan Chai East Preliminary Treatment Works



General view of Wanchai East PTW



Before flow turning process



After flow turning process

**Annex 4 – Photomontage of Stonecutters Island Sewage Treatment  
Works Upon Completion of HATS Stage 2A**

