Progress of the Proposed Tseung Kwan O Desalination Plant Project

1 <u>Purpose</u>

This paper aims to provide the Sai Kung District Council (SKDC) with an update on the progress of the proposed Tseung Kwan O (TKO) desalination plant project, and seek the SKDCøs support for the proposed amendment to the TKO Outline Zoning Plan for the area earmarked for the proposed desalination plant in TKO Area 137.

2 Background of the Project

- 2.1 A reliable fresh water supply is of paramount importance to sustaining Hong Kongøs development and economic growth. However, our fresh water resources are facing various challenges, including increasing water demand arising from population and economic growth, fluctuating local yield, climate change, as well as keen competition for the Dongjiang (DJ) water resource due to the rapid economic development in the Pearl River Delta Area.
- 2.2 The total quantity of water extracted from DJ for water supply is increasing every year. The water resource available from DJ and the yield collected from the local water gathering ground may not be able to meet the water demand of Hong Kong during a severe drought with a return period of 1 in 100 years. Moreover, climate change will bring about extremely dry weather at more frequent intervals and increase the likelihood of consecutive droughts. To safeguard water security in Hong Kong, we need to develop an alternative water resource by seawater desalination which is not susceptible to climate change.

- 2.3 In December 2012, we engaged consultants to commence a planning and investigation (P&I) study for the proposed desalination plant in TKO Area 137. The P&I study was completed in 2015. It confirmed the technical feasibility of the project including its environmental viability and provided a preliminary design of the plant.
- 2.4 On 6 January 2015, we briefed Members of the Sai Kung District Council about key results of the P&I study and obtained their support for the proposed review, design and associated site investigation works for the project.
- 2.5 Subsequently, the environmental impact assessment (EIA) for the project was completed in May 2015 and the EIA report was approved under the Environmental Impact Assessment Ordinance by the Environmental Protection Department (EPD) in November 2015. On 4 December 2015, EPD issued an Environmental Permit (EP) for the construction and operation of the desalination plant.
- 2.6 In November 2015, we engaged consultants to proceed with the review, design and site investigation works for the first stage of the proposed desalination plant at TKO. The first stage of the plant will have a water production capacity of about 135 million litres per day (Mld) with provision for expansion to 270 Mld to meet 5 to 10 percent of the overall fresh water demand of Hong Kong.

3 Design of the First Stage of TKO Desalination Plant

3.1 The first stage of the TKO desalination plant project comprises the following key components:

- a) construction of the first stage of the proposed desalination plant with a water production capacity at 135 Mld with provision for future expansion to the ultimate water production capacity up to 270 Mld and associated facilities;
- b) formation of a 10-hectare site earmarked at TKO Area 137 for the desalination plant and associated facilities with the ultimate water production capacity at 270 Mld;
- c) construction of the intake and outfall facilities of the proposed desalination plant with capacities catering for the ultimate water production capacity of the proposed desalination plant at 270 Mld;
- associated works including environmental impact mitigation, slope stabilisation and landscaping works; and
- e) associated mainlaying works for conveying the fresh water produced at the proposed desalination plant to existing fresh water service reservoirs.

The project layout plan is shown in Annex 1.

3.2 The proposed plant will adopt the latest seawater reverse osmosis (SWRO) treatment technology. The desalinated water will comply with the World Health Organization¢s õGuidelines for Drinking-water Qualityö (WHO 2011). A diagram on the proposed seawater desalination process is enclosed in **Annex 2**. The consultants are looking into various options of optimizing the energy consumption of desalination with innovative design features, in terms of pre-treatment process of lower energy consumption, optimal sizing of plant and equipment, and advanced energy recovery system for greater energy efficiency. In addition, the plant will adopt suitable architectural and landscaping design to harmonize with the surrounding environment. A preliminary layout of the desalination plant is shown in **Annex 3**.

3.3 We are carrying out detailed design for the water mains by in-house resources. The works will involve laying of about 9.5 kilometres of water mains with a diameter of 1 200 millimetres (mm) along Wan Po Road, Po Hong Road and Tsui Lam Road, for transferring water produced from the proposed desalination plant to the existing Tseung Kwan O Primary Service Reservoir and other existing service reservoirs. The proposed alignment of the water mains is shown in Annex 1. The alignment has been designed to minimse impact to the road traffic and trenchless construction method will be adopted for laying of water mains along busy road junctions and some critical road sections where necessary.

4 Impact Assessments and Arrangement for the Construction Stage

- 4.1 The approved EIA concluded that with the implementation of appropriate mitigation measures, no unacceptable environmental impacts are envisaged. Prior to commencing construction works for the proposed desalination plant, we will require the contractor to prepare and submit an Environmental Monitoring and Assessment Plan as per the EP requirements to EPD for approval. During the construction stage of the proposed desalination plant, we will implement relevant environmental mitigation measures and monitoring for ensuring compliance with the EP requirements as well as relevant environmental protection regulations.
- 4.2 We have carried out a traffic impact assessment (TIA) for the proposed water mainlaying works. The TIA results reveal that the mainlaying works through implementation of appropriate temporary traffic management schemes would not cause any significant impact on the traffic. We will closely liaise with the Transport Department, Hong Kong Police Force and Highways Department for taking into account their comments and requirements for the TIA. During the construction stage, we will also keep close contact

with relevant government departments and require the contractor to implement the temporary traffic management measures in order to minimise the traffic impact arising from the mainlaying works.

5 <u>Way Forward</u>

We plan to submit funding application to the Legislative Council Finance Committee in due course according to the established procedure for public works projects. If all the work proceeds smoothly, it is expected that the mainlaying works and the plant construction can commence in 2017 and 2018 respectively for commissioning of the first stage of the proposed desalination plant by 2020-2021 the earliest.

6 Advice Sought

Members are invited to offer comments, and lend support to the project and the proposed amendment to the TKO Outline Zoning Plan for the area earmarked for the proposed TKO desalination plant in TKO Area 137.

7 <u>Attachments</u>

Annex 1	Project layout plan
Annex 2	Seawater desalination process diagram
Annex 3	Preliminary layout of the first stage of the proposed desalination plant

Water Supplies Department July 2016



海水化淡處理流程圖 Seawater Desalination Process Diagram



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