

1 INTRODUCTION

1.1 Background

The Water Supplies Department (hereinafter referred to as WSD) is proposing the development of a medium-sized desalination plant in Hong Kong, at a site reserved in Tseung Kwan O (TKO Area 137). The proposed desalination plant will produce potable water with an initial capacity of 135 million liter per day (Mld), expandable to an ultimate capacity of 270Mld in the future to provide a secure and alternative fresh water resources complying with the World Health Organization (WHO) standards. This project is entitled "Desalination Plant at Tseung Kwan O" (hereinafter referred to the Project).

Under the Environmental Impact Assessment Ordinance (EIAO), an Environmental Permit (EP) will be required for the construction and operation of the proposed Project. In relation to this, WSD has prepared a Project Profile for application for an Environmental Impact Assessment (EIA) study brief under section 5(1) of the EIAO (No. PP-497/2013). The Project Profile was submitted to EPD on 5 December 2013. The EIA Study Brief (No. ESB-266/2013) was issued by EPD on 16 January 2014.

Black & Veatch Hong Kong Limited (B&V) was commissioned by WSD under Agreement No. CE 21/2012 (WS) to provide consultancy services to investigate and formulate a detailed proposal for the Project and conduct the EIA study.

1.2 Purpose and Nature of the Project

The proposed Project comprises the following:

- Construction of a new desalination plant in TKO Area 137 with a capacity of 135Mld, expandable to 270Mld in the future;
- Natural slope mitigation works consist of construction of debris barriers and boulder traps at the toe of and stabilization of natural slopes and boulders on the natural slope within the Clear Water Bay Country Park (*Figure 1.1*), which overlooks the northeast boundary of the new desalination plant at TKO Area 137;
- Construction of a dedicated trunk feed system for the transfer of fresh water output from the desalination plant to the existing Tseung Kwan O Fresh Water Primary Service Reservoir (TKOFWPSR). The system consists of an about 9 km of 1,200 mm diameter fresh water mains along Wan Po Road, Po Hong Road and Tsui Lam Road (fresh water main is indicated in *Figure 1.1*), the associated pipeworks and ancillary facilities including fittings/valves, leakage, flow and pressure monitoring facilities, and a new treated water pumping station and new treated water storage tank with estimated size about 22,500m³ located in the desalination plant; and
- All the associated civil, structural, geotechnical, landscaping, electrical and mechanical works.

The location of the Project and the associated works are shown in *Figure 1.1*.

The following elements of the Project are classified as Designated Projects under the *Environmental Impact Assessment Ordinance (Cap. 499)* (EIAO) and are addressed in this EIA Report:

- Schedule 2, Part I, Item E.2 – Water treatment works with a capacity of more than 100,000 m³ per day.
- Schedule 2, Part I, Item K.13 – A dangerous goods godown with a storage capacity exceeding 500 tonnes.
- Schedule 2, Part I, Q.1 – Earthworks partly in an existing country park.

1.3 Purpose of the EIA

This EIA Report is prepared in accordance with the *EIA Study Brief (No. ESB-266/2013)* and the *Technical Memorandum of the Environmental Impact Assessment Process (EIAO-TM)*.

The purpose of this EIA Study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the Project and related activities that take place concurrently. This information will contribute to decision by the Director on:

- The acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;
- The conditions and requirements for the design, construction and operation of the Project to mitigate against adverse environmental consequences; and
- The acceptability of residual impacts after the proposed mitigation measures is implemented.

The specific objectives of the EIA Study are described in *Clause 2* of the *EIA Study Brief*, and the detailed requirements of the EIA Study are set out in *Clause 3* of the *EIA Study Brief*. As specified in the *EIA Study Brief*, the EIA Study has addressed the key environmental issues associated with the construction and operation of the Project in Hong Kong waters and land.

1.4 Location and Scale of the Project & History of the Site

The proposed site for the desalination plant is located in Tseung Kwan O (TKO) Area 137 with an earmarked area of about 10 hectares. TKO Area 137 is located to the south of the Southeast New Territories (SENT) Landfill and the Tseung Kwan O Industrial Estate. It faces the Clearwater Bay Country Park to its east, the Joss House Bay to its south and the Tathong Channel to its west. The nearest residential area is the LOHAS Park which is located about 2.5 km from the site.

The site is on reclaimed land which was reclaimed between 1998 and 2000. According to the draft Tseung Kwan O Outline Zoning Plan (OZP) S/TKO/21, the TKO Area 137 is zoned as “Other Specified Uses” annotated “Deep Waterfront Industry” (“OU (DWI)”) which is intended for special industries which require marine access, access to deep

water berths or water frontage. It is considered that amendment to the OZP is required to rezone the site to an appropriate zone under *Town Planning Ordinance*.

The natural slope overlooking the northeast boundary of the new desalination plant at TKO Area 137 has a history of minor landslides and contains some potentially unstable boulders. Landslide and boulder hazard mitigation works including mainly passive debris barriers and boulder traps along the crest of the cliff area at lower portion of the natural slope, soil and rock stabilization works including soil nailing and dowelling at the cliff area, stabilization of individual boulders by buttressing may be required to protect the new desalination plant for the landslide and boulder hazards from this slope. While such mitigation works may be required to be implemented within the Clear Water Bay Country Park, the mitigation works will be avoided and minimized as far as practicable to minimize any potential environmental impact to the Country Park.

No permanent major infrastructure has been built in and around the proposed site. At present, three major facilities are located in the vicinity of the site, namely a temporary public fill bank, a temporary explosive magazine and an explosives off-loading barging pier. These facilities are discussed in further detail in *Section 3.8*.

1.5 The Scoping of Environmental Issues

The potential environmental impacts which may arise from the construction and operation of the Project were identified and discussed in the Project Profile ⁽¹⁾ for this EIA. The specific scope for this EIA Study is presented in *Clause 3.2* of the *EIA Study Brief*.

1.6 Structure of this Report

Following the introductory section, the remainder of this EIA Report is arranged as follows:

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| <i>Section 2</i> | This section of the EIA Report presents the findings of assessments in considering alternative development options (including extent, layout and design of the Project), and alternative construction methods for the proposed Project. This section concludes with an introduction to the preferred scenario for the proposed Project. |
| <i>Section 3</i> | Provides a description of the Project highlighting the key facilities to be constructed, the timeline for implementing the Project and the operational activities. This section forms the basis of the technical assessment presented in <i>Sections 4 – 13</i> below. |
| <i>Section 4</i> | Presents details of an assessment of impacts from the construction and operation of the Project to air quality sensitive receivers. |
| <i>Section 5</i> | Presents details of an assessment of impacts from the construction and operation of the Projects to noise sensitive receivers. |

(1) B&V/ERM (2012). Project Profile. Agreement No. CE21/2012 (WS) Desalination Plant at Tseung Kwan O Feasibility Study. Available at:
<http://www.epd.gov.hk/eia/register/profile/latest/esb266/esb266.pdf>

- Section 6* Details the assessment of impacts to water quality sensitive receivers arising from the construction and operation of the Project.
- Section 7* Presents the sewerage and sewage treatment implications from operation of the Project.
- Section 8* Presents details the waste management implications from the construction and operation of the Project.
- Section 8A* Identifies the potential land contamination problem due to historical land use of the Project.
- Section 9* Presents details of an assessment of impact from the construction and operation of the Project to terrestrial and aquatic ecological resources.
- Section 10* Details the assessment of impacts to fisheries resources and fishing operations arising from the construction and operation of the Project.
- Section 11* Presents the details of an assessment of impacts from the construction and operation of the Project to landscape and visual sensitive receivers.
- Section 12* Presents the details of landfill gas hazard assessment of the Project.
- Section 13* Presents the hazard to life assessment from the construction and operation of the Project.
- Section 14* Introduces a summary of the environmental monitoring and audit (EM&A) measures for the Project.
- Section 15* Presents a summary of the environmental outcomes of the EIA Study.