Annex A

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-EIA Paper 9/2016
For advice on 21 November 2016

Environmental Impact Assessment Ordinance (Cap. 499)
Environmental Impact Assessment Report
Expansion of Sha Tau Kok Sewage Treatment Works

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report on "Expansion of Sha Tau Kok Sewage Treatment Works" ("the Project") submitted under section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-245/2016). The Drainage Services Department (DSD) (the Applicant) and its consultants will present the report at the meeting of EIA Subcommittee.

ADVICE SOUGHT

2. Members' views are sought on the findings and recommendations of the EIA report. The Environmental Protection Department (EPD) will take into account comments from the public and the Advisory Council on the Environment (ACE) in deciding whether or not to approve the EIA report under Section 8(3) of the EIAO.

BACKGROUND

3. The existing Sha Tau Kok Sewage Treatment Works (STKSTW) is located at Sha Tau Kok Town. It currently provides secondary level treatment to sewage collected from Sha Tau Kok area, with a design capacity of 1,660 m^3/day at average dry weather flow (ADWF). The Project will increase its treatment capacity to 10,000

m^3/day at ADWF in two phases, with enhancement through adopting membrane-bioreactor (MBR) type treatment process and provision of a new submarine outfall.

4. The Applicant submitted the EIA report for the Project for approval. The EPD, in consultation with relevant authorities, considered that the EIA report met the requirements in the EIA Study Brief and the Technical Memorandum on EIA Process (TM), for the purpose of exhibiting the report for public inspection, under Section 7(4) of the EIAO.

NEED FOR THE PROJECT

5. The existing capacity of STKSTW is expected to be fully committed in early 2019 based on the latest planning data and village sewerage programme. The Project is needed to meet projected sewage treatment demand arising from planned development and population growth in the Sha Tau Kok area, as well as planned extension of village sewerage.

6. The existing submarine outfall which discharges treated effluent near-shore in Starling Inlet is inadequate to cope with the increased sewage flow. Construction of a new submarine outfall is needed. The new discharge point, equipped with a diffuser to enhance the mixing and dilution of effluent with surrounding water, will be located in the waters near Ah Kung Au which is away from the water sensitive receivers (WSRs).

DESCRIPTION OF THE PROJECT

7. The Project site has an area of about 4,950 m^2 and the proposed diffuser covers an area of approximately 1,188 m^2 (54m x 22m). The location and layout of the Project is shown in **Figure 1**. Major components of the Project include –

(i) construct a temporary sewage treatment plant (TSTP) with treatment capacity of 2,500 m^3 / day at ADWF to provide uninterrupted sewage treatment services for the STK area during the expansion works from 2018 to the scheduled commission date of the STKSTW Phase 1 expansion in 2021. The TSTP will be decommissioned upon commissioning of the Phase 1 expansion;

(ii) develop the Phase 1 expansion of STKSTW with a treatment capacity of 5,000 m^3/day at ADWF by 2021, and Phase 2 expansion with a treatment capacity of 10,000 m^3/day at ADWF by 2030;
(iii) construct a 1.7km long new submarine outfall;
(iv) construct a 520m long new gravity sewer in the STK Town to replace the rising main between the existing Sha Tau Kok Sewage Pumping Station (STKSPS) and STKSTW;
(v) demolish the STKSPS and decommission the rising main; and
(vi) provide for the production of reclaimed water (maximum design flow of 50 m^3/day) from treated effluent for non-potable use within the STKSTW.

8. The Project is classified as a designated project under the following items in Part I, Schedule 2 of the EIAO:

(i) F.2 – *Sewage treatment works with an installed capacity of more than 5,000 m^3 per day; and a boundary of which is less than 200m from the nearest boundary of an existing or planned residential area; place of worship; educational institution; or health care institution.*
(ii) F.4 – *An activity for the reuse of treated sewage effluent from a treatment plant.*
(iii) F.6 – *A submarine sewage outfall.*

ENVIRONMENTAL BENEFITS

9. According to the EIA report, the Project will bring about the following environmental benefits upon its completion:

(i) provide more treatment capacity within the existing STKSTW site;
(ii) produce treated effluent of better quality;
(iii) locate the discharge point of the new submarine outfall away from sensitive receivers, including fish culture zones (FCZs) and identified species of conservation importance;
(iv) enclose the treatment facilities and provide odour treatment to improve air quality; and

(v) incorporate environmental enhancement features in the Project, including renewable energy, energy-efficient electrical and mechanical equipment, greening, and water saving measures, etc.

CONSIDERATION OF ALTERNATIVE OPTIONS

Options of Expansion Scheme

10. Three expansion options have been investigated i.e. (1) off-site TSTP, (2) on-site TSTP and expansion, and (3) off-site expansion for Phase 1 of the Project, with Option 2 being the preferred option. Option 1 requires a site near the Night Roosting Site for Great Egrets and Option 3 requires relocation of the existing Police Operation Base. Option 2 does not require a site outside STKSTW, and it has the environmental benefit of a smaller footprint and hence less environmental impacts when compared with the other 2 Options.

Treatment Level and Options of Treatment Process

11. Secondary treatment level, which is capable of producing treated effluent meeting the Water Quality Objectives (WQOs) of Mirs Bay Water Control Zone (WCZ), is proposed for the Project. Three secondary level treatment processes i.e. Membrane Bioreactor (MBR), Moving Bed Bioreactor with Dissolved Air Floatation (MBBR+DAF) and Sequencing Batch Reactor (SBR) have been investigated in the EIA report. Comparing with MBBR and SBR, MBR can provide the best effluent quality with the same footprint and produce the least amount of sludge. MBR is adopted as the preferred treatment process for the Project.

Options of Submarine Outfall Alignment

12. Two discharge locations have been considered. One is discharging in the vicinity of the existing outfall discharge location, and the other one is discharging further away in the waters near Ah Kung Au. The discharge location near Au Kung Au is preferred because it will be located farther away from the identified WSRs which are mainly in inner waters.

Options of New Gravity Sewer Alignment

13. Two options of gravity sewer alignment have been investigated. The first

option is to lay new sewer along the existing rising main on the Sha Tau Kok Road – Shek Chung Au section. The second option is to lay new sewer along Shun Hing Street. The Shun Hing Street Option, which will affect fewer environmental sensitive receivers, is selected as the preferred option.

SPECIFIC ENVIRONMENTAL ASPECTS TO HIGHLIGHT

Water Quality Impact

14. During the operation phase of the Project, the TSTP will adopt Moving Bed Biofilm Reactor (MBBR) with additional Chemical Enhanced Primary Treatment (CEPT) as necessary. The effluent standard would be better than the existing STKSTW. The result of operation phase water quality modelling assessment indicates full compliance with the Water Quality Objectives (WQO) criteria at all WSRs.

15. Precautionary measures have been recommended in the EIA report to avoid / minimize the chance of emergency discharge during the operation of the Project. These measures include provision of backup storage for raw sewage up to 6 hours, dual power supply and backup generator, standby equipment for all treatment units, 24-hour monitoring of the STKSTW operation, remote control and monitoring system, routine / regular checking of the equipment, and maintenance and repair procedure to resume plant normal operation within 6 hours. The EIA report has also recommended the submission of an Emergency Response Plan (ERP) for EPD's agreement prior to the commissioning of operation of the Project. The ERP will set out the reporting, remediation and investigation procedures in the event of emergency discharge.

16. For the construction of the Project, the EIA report has recommended Horizontal Direction Drilling (HDD), a trenchless method for construction of the new submarine outfall to minimize marine water quality impact. For the construction of the diffuser, a cofferdam will be installed so that excavation of marine sediment inside the cofferdam will be done in dry condition to minimize sediment release to the water column. Other construction activities are mainly land-based. No adverse construction water quality impact is identified in the EIA report.

Ecological and Fisheries Impact

17. Regarding operation phase ecological and fisheries impact of the Project, sensitive receivers including FCZs, nursery ground of commercial fisheries, and

artificial reefs are located at least 1.17 km, 2 km, and 5.88 km respectively away from the diffuser of the submarine outfall. As mentioned above, the EIA report has recommended precautionary measures to avoid / minimize chance of emergency discharge, as well as submission of ERP prior to operation of the Project. No adverse operation ecological and fisheries impact is identified in the EIA report.

18. Construction impacts to marine ecological resources have been substantially avoided by trenchless construction method for the new submarine outfall. Optimization of length and alignment of the submarine outfall also help avoid key sensitive receivers. While there will be loss of 0.18 ha of subtidal soft bottom habitat and 0.042 ha of fishing ground due to the diffuser footprint, the EIA report considers that the area concerned are of low ecological value or low fisheries importance, and the impact is acceptable.

19. The Project will have no direct construction impact on identified terrestrial habitats in the assessment area. In order to minimize any indirect impact to the Night Roosting Site of Great Egrets due to the demolition of the STKSPS, the EIA report recommends that no work shall be undertaken within 100 m from the Night Roosting Site from 16:00 to 07:00 of the following day.

20. With implementation of recommended mitigation measures, the EIA report finds that no unacceptable ecological and fisheries impact is envisaged.

Air Quality

21. In order to minimize potential odour impact to surrounding ASRs during operation of the Project, major process equipment will be enclosed inside substructure / superstructure. Deodourizing facility with 99.5% odour removal efficiency will be provided at exhaust. Quantitative assessment under the EIA report finds that odour concentration at all identified ASRs will fully comply with the odour criterion. Regarding the construction of the Project, no major earthwork or site formation works will be required. Therefore, no adverse construction dust impact is anticipated in the EIA report.

Noise Impact

22. Operational fixed plant noise sources will be enclosed inside building structure. Openings, including louvres for ventilation and machine room doors, will be oriented away from NSRs. Silencers, acoustic louvres or acoustic doors will be used where

necessary. The EIA report predicts that operational fixed plant noise level will fall within relevant noise criteria.

23. Construction noise assessment has been undertaken and the predicted noise levels at representative noise sensitive receivers (NSRs) comply with the noise criteria during daytime. There will be no construction works during restricted hours.

Other Environmental Impacts

24. Other impacts, including landscape and visual, waste management, land contamination, and heritage, have been addressed in the EIA report. With implementation of recommended mitigation measures, the EIA report predicts that the Project will comply with the relevant requirements under the TM.

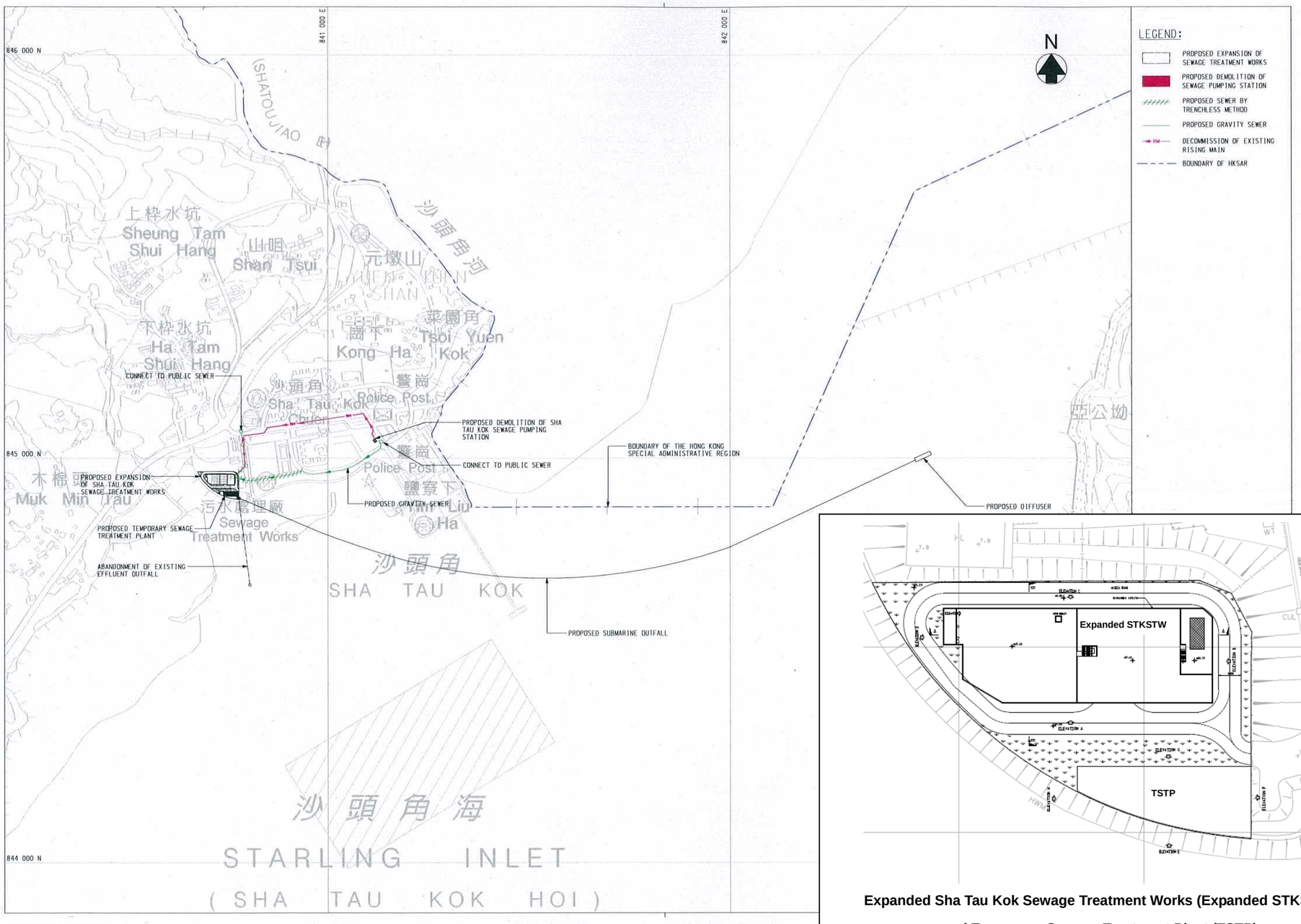
ENVIRONMENTAL MONITORING AND AUDIT

25. The EIA report includes an Environmental Monitoring and Audit (EM&A) Manual which recommends an EM&A programme during the construction and operation stages of the Project. Key recommended EM&A requirements include construction phase water quality monitoring at selected WSRs to cover the whole period of marine works associated with the proposed outfall diffuser; operation phase water quality monitoring at selected WSRs during the initial operation of different phases of the Project; and commissioning test prior to their operation to ascertain the effectiveness of the deodourization systems.

PUBLIC CONSULTATION

26. The Applicant has made the EIA report, EM&A Manual and Executive Summary available for public to comment under the EIAO from 2 September 2016 to 1 October 2016. During this inspection period, no public comment was received by the EPD.

November 2016
Environmental Assessment Division
Environmental Protection Department



Expanded Sha Tau Kok Sewage Treatment Works (Expanded STKSTW) and Temporary Sewage Treatment Plant (TSTP)

Project Title	**Expansion of Sha Tau Kok Sewage Treatment Works**	Application No.: EIA-245/2016	
Figure 1	**Layout Plan**		