

**Project Profile**

**for**

**Expansion of Sha Tau Kok Sewage Treatment Works**



**Drainage Services Department  
The Government of the Hong Kong Special Administrative Region**

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Annex Expansion of Sha Tau Kok Sewage Treatment Works, General Layout Plan (Drawing No. DCM/2012/127)

## **1. BASIC INFORMATION**

### **1.1 Project Title**

The title of this project is:-

“Expansion of Sha Tau Kok Sewage Treatment Works” hereinafter referred to as “the Project”.

### **1.2 Purpose and Nature of the Project**

The existing Sha Tau Kok Sewage Treatment Works (STKSTW) was built in 1989 and is a secondary treatment works which provides treatment to the sewage collected from Sha Tau Kok Town, Yim Liu Ha, Tsoi Yuen Kok and Sha Tau Kok Chuen before discharging into Starling Inlet. It has a treatment capacity of 1,660 cubic metres per day ( $\text{m}^3/\text{day}$ ) at average dry weather flow (ADWF).

To cope with the forecast increase in sewage flow in Sha Tau Kok sewage catchment, expansion of STKSTW is required. A piece of government land of about 3,000 square metres ( $\text{m}^2$ ) to the north of the existing STKSTW is identified as the proposed site for the expansion works. This piece of land is being occupied as Sha Tau Kok Police Operation Base which will be relocated to a vacant government land adjacent to Sha Ho Road.

This Project aims to increase the treatment capacity of STKSTW to 10,000  $\text{m}^3/\text{day}$  at ADWF by 2031. Key elements of the Project include:

- (i) relocation of the existing police operation base;
- (ii) Expansion of STKSTW including modification/upgrading of existing treatment facilities in STKSTW with a view to increasing the treatment capacity of the plant to 10,000  $\text{m}^3/\text{day}$  at ADWF by 2031;
- (iii) construction of a new submarine outfall;
- (iv) upgrading of the existing Sha Tau Kok sewage pumping station and the rising main between Sha Tau Kok sewage pumping station and STKSTW;
- (v) demolition of the existing submarine outfall; and
- (vi) the associated ancillary works.

### **1.3 Name of the Project Proponent**

Consultants Management Division, Drainage Services Department (DSD) of the Government of the Hong Kong Special Administrative Region

### **1.4 Location of the Project**

The proposed sewage treatment works expansion are located at Sha Tau Kok. The extent is indicated on General Layout Plan No. **DCM/2012/127**.

### **1.5 Type of Designated Project Involved**

Based on the definition as listed in Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO), the following work items are classified as designated projects:

- sewage treatment works with an installed capacity of more than 5,000 m<sup>3</sup>/day and a boundary of which is less than 200 m from the nearest boundary of an existing residential area under Part I, F2; and
- a submarine sewage outfall under Part I, F6.

### **1.6 Name and Telephone Number of Contact Person**

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## **2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

### **2.1 Project Planning and Implementation**

Consultants will be engaged by the project proponent to undertake investigation of sewage treatment technologies, environmental impact assessment, and carry out the detailed design and construction supervision of the Project. DSD will operate and maintain the completed works.

### **2.2 Project Programme**

The Project will be implemented in two phases. The construction works for the Phase 1 expansion of STKSTW are planned to commence in January 2016 for completion in December 2020 to increase the treatment capacity of STKSTW to at least 5,000 m<sup>3</sup>/day at ADWF. Further expansion to increase the treatment capacity of STKSTW to 10,000 m<sup>3</sup>/day at ADWF will be completed by 2031.

### **3. POSSIBLE IMPACT ON THE ENVIRONMENT**

#### **3.1 Outline Process Involved**

The Project will expand the treatment capacity of the existing STKSTW and upgrade the submarine outfall to cope with the anticipated increase in sewage flow in Sha Tau Kok areas. There are various treatment technologies available for the removal of biochemical oxygen demand, suspended solids and disinfection. A comprehensive review on various treatment technologies would be carried out in parallel with the environmental impact assessment to determine the appropriate sewage treatment process option. Treatment options, such as membrane bioreactors with less amount of land intake would be included in the comprehensive treatment technology review.

The preliminary design of the STKSTW incorporates the inlet pumping station, inlet coarse and fine screens, grit removal facilities, bioreactor, sludge holding tanks and dewatering units. The treated effluent will be discharged to sea through the proposed effluent submarine outfall. The dewatered sludge will be disposed of at landfill.

Major construction activities will include earthworks (excavation and backfilling works), piling, construction of concrete structures, pipe jacking, pipe laying, dredging, demolition of existing structures, disposal of excavated/dredged/demolished materials and installation of electrical and mechanical plant and equipment.

#### **3.2 Construction Phase**

##### **3.2.1 Air Quality**

Dust emissions would be resulted from construction activities such as earthworks, excavation, construction of concrete structures and demolition of the existing structures.

##### **3.2.2 Noise**

Noise would be generated from construction activities through the use of conventional construction plant and equipment, like piling equipment, air compressors and excavators.

##### **3.2.3 Water Quality**

Runoff from the site during construction may contain sediments and silts arising from

earthworks, and oil and lubricants from construction vehicles and plant. Muddy water may also be generated from construction activities such as dust suppression sprays, dewatering during excavation and washing of construction equipment.

Dredging works for laying of the submarine outfall may have impacts on the marine environment. Dredging of seabed may release sediments, hence increasing suspended solids concentrations. Contaminants originally trapped in the sediments, if any, may also be released into the water column during the dredging process.

### 3.2.4 Waste Generation

Waste generated during the construction phase may include:-

- Waste spoil from site clearance, site preparation and earthworks;
- Waste material such as wood, metal scraps and concrete generated from the construction process and also from demolition of existing structures;
- General waste from workers; and
- Chemical waste from maintenance of construction plant and equipment such as lubrication oil.

### 3.2.5 Ecology

Construction works, including the dredging activities, may have impacts on the marine ecology at Starling Inlet and the mangrove strands at Nga Yiu Tau.

### 3.2.6 Landscape and Visual

There may be a loss of vegetations and trees at the proposed sites and their surrounding areas during the construction. Visual impacts resulted from the construction activities, such as construction equipment and stockpiled materials on works site, will be temporary.

### 3.2.7 Traffic

Construction materials for the Project will need to be delivered to the site and the temporary storage areas. Traffic generated during the construction phase will be temporary and limited to a small number of vehicles delivering plant and construction materials. Therefore, the traffic impact during the construction stage will be insignificant.

### 3.2.8 Fisheries Impacts

There is an existing fish culture zone at Starling Inlet, about 600 meters to the south of STKSTW. Construction of the submarine outfall will require marine works. This may result in some extent of fishing ground loss and impacts on the nearby fish culture zone during the construction stage.

### 3.2.9 Cultural Heritage

A Tin Hau Temple is located about 50 meters of the existing STKSTW. No impacts on historic monuments or buildings are expected during the construction phase. There is no recorded marine archaeological site located in the vicinity of the proposed submarine outfall.

## 3.3 Operation Phase

### 3.3.1 Air Quality

The potential odour sources are the treatment processes of STKSTW such as the sedimentation tanks, sludge treatment units, and sludge and screening handling facilities.

### 3.3.2 Noise

Blowers, pumps/motors, ventilation equipment and other machinery are potential noise sources during operation phase of the Project.

### 3.3.3 Water Quality

The Project will help protect the water quality of Starling Inlet. The Project is designed to cater for increasing sewage flow in the sewerage catchment and committed extension of public sewerage to unsewered areas in Sha Tau Kok. Upon commissioning of the Project and extension of the public sewerage, pollution loadings to the Starling Inlet from the unsewered areas would be reduced. Potential impact may arise due to the discharge of untreated sewage during an event of emergency overflow.

### 3.3.4 Waste Generation

Waste generated in the operation phase will principally be gross solids and sludge. The



sludge volume will be reduced by sludge dewatering and subsequently conveyed for disposal at landfill.

### 3.3.5 Ecology

The impact on ecology due to noise and odour during the operation phase is considered to be minimal. Upon commissioning of the Project and extension of public sewerage, pollution loadings to the Starling Inlet from the unsewered areas would be reduced. Potential impact on the local marine ecology and the mangrove strands by effluent discharge may arise during normal operation or emergency sewage overflow situation. Assessment should be conducted to address these impacts and proposed mitigation measures.

### 3.3.6 Landscape and Visual

The additional above-ground treatment units and structures may induce visual impacts to the surroundings.

### 3.3.7 Traffic

The impact on traffic during the operation phase of the Project is considered to be insignificant.

### 3.3.8 Fisheries Impacts

Potential impact on fisheries may include temporary or permanent loss of fishing ground because of the increased discharge of effluent and discharge of untreated sewage during an event of emergency overflow.

### 3.3.9 Cultural Heritage

A Tin Hau Temple is located about 50 meters of the existing STKSTW. No impacts on historic monuments or buildings or sites of marine archaeological interest are expected during the operation phase.

#### **4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT**

##### **4.1 Existing and Planned Sensitive Receivers and Sensitive Parts of the Natural Environment**

The Project is located at the south-west of Sha Tau Kok town. The nearest identified noise and air sensitive receivers are village-type residential premises including Sha Tau Kok Chuen and Ha Tam Shui Hang located within 500m of the site.

Recognized sites of conservation importance near the project site include nearby green belt and mangrove along the north boundary of the existing police operation base.

There is a fish culture zone at Starling Inlet, about 600 meters from the existing STKSTW.

##### **4.2 Major Elements of the Surrounding Environment Affecting the Project**

The site, adjacent to Starling Inlet, is within the Mirs Bay Water Control Zone according to Water Pollution Control Ordinance.

Subject to the treatment process to be selected, the potential environmental impacts will be addressed in the Environmental Impact Assessment study.

## **5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED INTO THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS**

This section describes those measures likely to be incorporated in the design to minimize environmental impacts arising from both construction and operation phases of the Project.

### **5.1 Construction Phase**

#### **5.1.1 Air Quality**

The extent of dust generation from the construction works is expected to be insignificant with the implementation of dust suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation of Air Pollution Control Ordinance (APCO). These measures would be incorporated into the specifications of the works contract.

#### **5.1.2 Noise**

The contractor for the works will have to comply with the provisions of the Noise Control Ordinance. The contractor will be required to follow good site practices, such as use of silenced plant and noise barriers near sensitive receivers, careful scheduling of activities, use of temporary acoustic barriers and acoustic machinery enclosures.

#### **5.1.3 Water Quality**

The construction activities in the Project would include excavation, earthworks, general concrete building works and demolition of existing structures. Necessary silt removal facilities will be provided to remove any silt before the discharge of site runoff into the nearby stormwater drains. The design of temporary on-site drainage and silt removal facilities will comply with the guidelines stipulated in EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). The above mitigation measures will be incorporated into the specifications of the works contract.

An assessment will be required to ensure that the Water Quality Objectives (WQOs) and marine environment would not be jeopardized by the construction/demolition of the outfall and associated dredging work, or the disposal of contaminated and/or uncontaminated mud. Provided that any measures proposed under the assessment are taken, no adverse impacts to water quality are expected during construction phase. Regular water quality monitoring at adjacent waters should be arranged during the

construction.

#### 5.1.4 Waste Management

Consideration will be taken during the design phase to minimize the generation of construction and demolition (C&D) materials by maximizing its re-use on site. The inert C&D materials such as concrete arising from the construction of the Project will be sorted on-site. The Contractor will be required to sort all C&D materials and waste into different categories for re-use on site and disposal at public filling, landfills, or recycling facilities as appropriate.

#### 5.1.5 Ecology

Construction works areas will be planned with measures to control construction runoff and drainage to minimize impacts on the water quality of the surrounding area and Starling Inlet, and thereby minimizing the potential for resulting ecological impacts. Pollution control measures will also be undertaken to alleviate the ecological impacts arising from dust and noise generated by the construction activities. Subject to the treatment process selected, a detailed ecological impact assessment, including the assessment of potential impact on the marine ecology and mangrove strands during demolition/construction of the submarine outfall, will be carried out. Necessary mitigation measures such as measures to prevent disturbed silt from affecting the living marine life will be recommended, with a view to demonstrating that the proposed works will not result in adverse residual ecological impact.

Avoidance of any identified sensitive site will be the preferred mitigation measure. In view of this, a piece of Government land at the north of STKSTW will be considered to accommodate the proposed expansion of sewage treatment facilities. This land parcel is now being used as a police operation base.

On the other hand, further investigation on different treatment technologies such as the use of membrane bioreactors with less land intake will be considered. Therefore, the requirement of additional land will be subject to the findings of the above investigations. Other modification works to the existing treatment facilities will be carried out within the existing STKSTW, an already built-up sewage treatment works compound.

#### 5.1.6 Landscape and Visual

Visual impacts from construction activities will be of very short durations. Proper control over site cleanliness and the stockpiling of materials will be exercised to alleviate visual intrusion. Hoarding will be erected at the site boundary as far as practicable to minimize the visual impact due to construction activities.

#### 5.1.7 Traffic

Where works are carried out on roads, temporary traffic arrangement measures will be undertaken to maintain traffic flow and minimize traffic impacts.

#### 5.1.8 Fisheries Impacts

Construction duration of submarine outfall will be shortened as far as practicable.

#### 5.1.9 Cultural Heritage

A Tin Hau Temple is located about 50 meters of the existing STKSTW. No cultural heritage impact is expected during the construction phase and hence no mitigation measure is necessary.

### **5.2 Operation Phase**

#### 5.2.1 Air Quality

Odour impact assessment will be conducted to identify the sources and impact to nearby sensitive receivers. Mitigation measures, such as covering up the major odour sources, providing adequate ventilation and odour removal system, may be implemented to reduce the odour impact.

#### 5.2.2 Noise

All pumps, motors, blowers and other mechanical equipment will be enclosed in structures or located underground in the dry/wet well. Therefore, any potential noise generation can be readily mitigated.

### 5.2.3 Water Quality

In normal operation, the upgraded STKSTW will produce effluent within the required standard under relevant ordinances. Even during major storms, all flows should pass through the preliminary treatment units and disinfection facilities prior to discharging in order to ensure no significant water pollution impacts. In addition, storm tanks, standby units or automatic-operated emergency generator should have been allowed in the design to minimize the need for untreated or partially treated discharges in extreme or emergency conditions. Water quality assessment will be conducted to analyze the impacts to the nearby sensitive receivers because of the increased discharge of effluent and discharge of untreated sewage during an event of emergency overflow and propose suitable protection measures.

### 5.2.4 Waste Management

Waste generated in the operation phase will comprise gross solids and sludge from the STKSTW. They would be collected and transported for disposal at landfill.

### 5.2.5 Ecology

An ecological impact assessment including comprehensive ecological survey will be carried out to assess the impacts. In order to preserve the ecological function of the area, the following mitigation measures will be implemented subject to the recommendations of the ecological impact assessment :-

- avoiding or minimizing activities with strong light and high levels of unpredictable noise near the sensitive area;
- avoiding treatment units and structures in/near the flight path of waterbirds or minimizing the height of these facilities to reduce the impacts to waterbirds; and
- architectural and landscaping features will be provided at STKSTW with a view to achieving a harmonious design for the facilities to blend with the existing environment;

During operation, there may be a possibility of untreated effluent discharge in adverse or emergency conditions. The mitigation measures described in Section 5.2.3 are relevant.

### 5.2.6 Landscape and Visual

Aesthetic consideration will be taken into account in the design of the Project, such as

enhancing the appearance of new buildings. Landscaping works may be undertaken to enhance the general outlook of the STKSTW.

#### 5.2.7 Traffic

Minimal traffic impact is expected during the operation phase.

#### 5.2.8 Fisheries Impacts

Submarine outfall will be designed to keep minimum disturbance to the existing seabed as far as practicable. Potential impact may arise because of the increased discharge of effluent and discharge of untreated sewage during an event of emergency overflow. Fisheries impact assessment of this Project will be carried out.

#### 5.2.9 Cultural Heritage

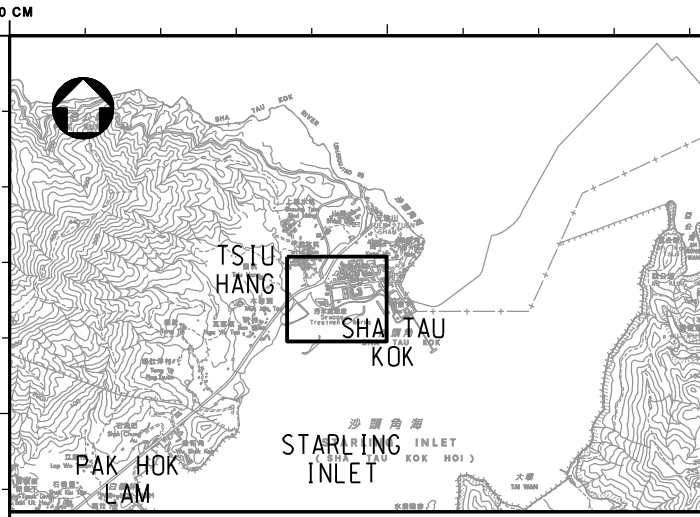
No cultural heritage impact is expected during the operation phase and hence no mitigation measure is necessary.

### **6. USE OF PREVIOUSLY APPROVED EIA REPORTS**

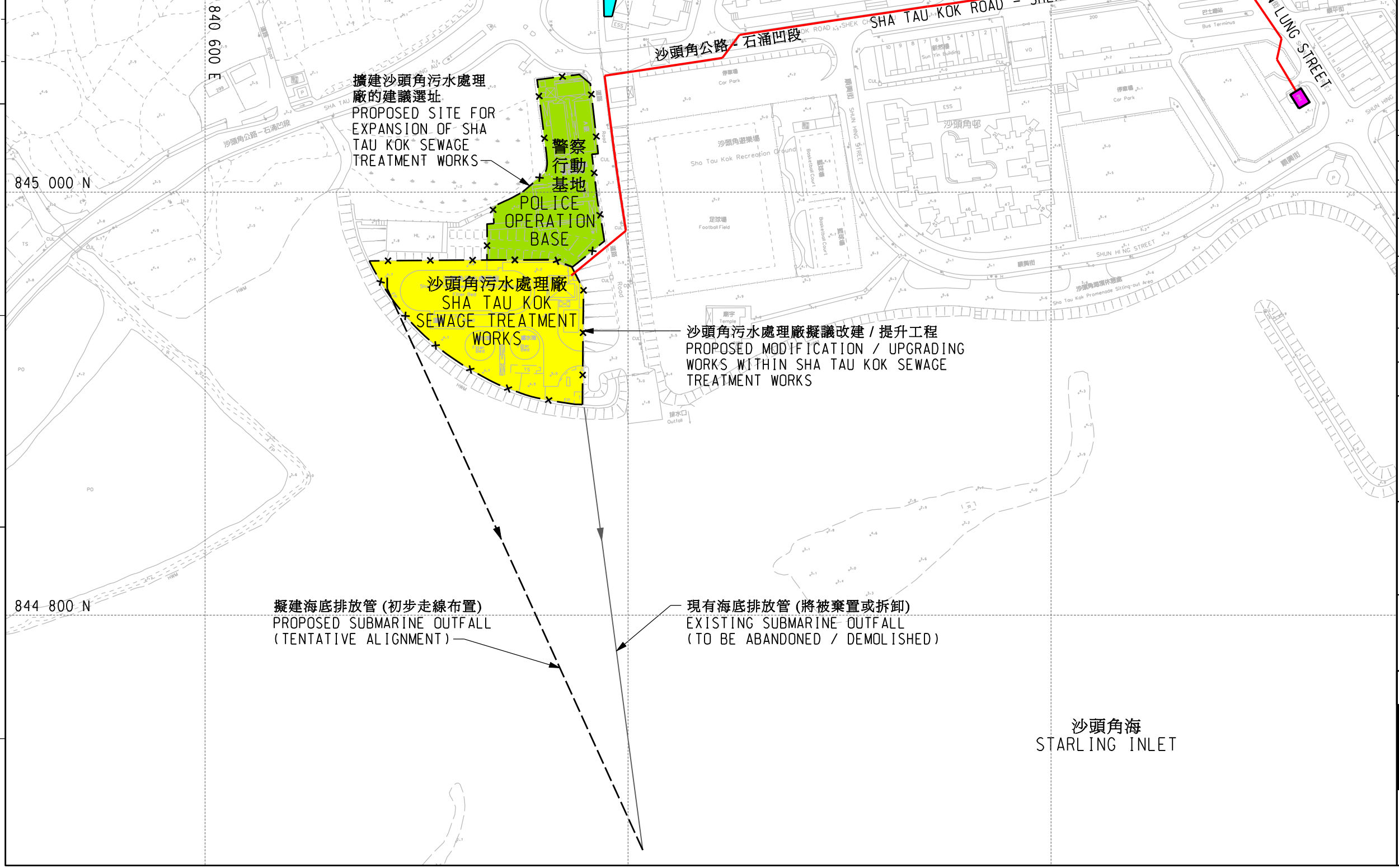
There is no EIA report already approved under the EIA Ordinance for this Project. However, the following reports are relevant and will be referred to in the EIA study. Where necessary, other relevant information identified during the study would also be considered and documented in the EIA.

- EIA-079/2004 – Peng Chau Sewage Treatment Works Upgrade
- EIA-075/2003 – Outlying Islands Sewerage Stage 1, Phase II Package J – Sok Kwu Wan Sewage Collection, Treatment and Disposal Facilities; and
- EIA-065/2002 – Ngong Ping Sewage Treatment Works and Sewerage.

**- END OF TEXT -**



**KEY PLAN**  
SCALE 1 : 50000



註 NOTES :

- 圖例 LEGEND :
- x - x - 工作範圍  
SITE BOUNDARY
  - [Pink Box] 擬議改善的現有污水泵房  
PROPOSED UPGRADING OF EXISTING SEWAGE PUMPING STATION
  - [Red Line] 擬議改善的現有加壓污水管  
PROPOSED UPGRADING OF EXISTING RISING MAINS

版 no.	日期 date	修改項目 description	簡簽 initial
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**修訂 REVISION**

	姓名 name	日期 date
繪畫 drawn	W. Y. HUI	31 OCT 2012
核對 checked	S. C. LO	31 OCT 2012
批核 approved	H. L. WONG	31 OCT 2012

合約編號 contract no.

檔案編號 file no.

工程編號 project no.

合約名稱 contract

**PROVISIONAL**  
SUBJECT TO AMENDMENT

圖則名稱 drawing title  
沙頭角污水處理廠第一期擴建工程 - 總平面圖  
EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS - PHASE 1 - GENERAL LAYOUT PLAN

圖則編號 drawing no.	比例 scale
DCM/2012/127	1 : 2000 OR AS SHOWN

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