

*1.1**PROJECT BACKGROUND*

The Planning and Engineering Feasibility Study for Sham Tseng Development (STD) commenced on 15 April 1998 having been commissioned by the Civil Engineering Office, Civil Engineering Department (CED). A Sham Tseng Development Feasibility Study (STDFS) and Sham Tseng Further Additional Studies (STFAS) were conducted in 1983 and 1985, respectively. These studies concluded that a reclamation between the former San Miguel Brewery Site and Anglers' Beach could be carried out. The preferred development option of the STDFS was incorporated into the Tsuen Wan West Outline Development Plan No. D/TWW/2 that was endorsed by the Development Progress Committee in May 1987.

In mid-1994, the "Task Force on Land Supply and Property Prices" recommended that the reclamation site in Sham Tseng should be developed for residential use to increase residential flat supply. It also recommended that more sites for Government institution or community (G/IC) facilities and district open space should also be introduced to address the district shortage.

The Territorial Development Strategy Review, which was released for public consultation in July 1996, indicated that the housing supply of approved plans and programmes would not be adequate to meet the estimated housing demand after 2000 / 2001. In order to increase the housing supply as well as the aspirations of local residents for G/IC facilities and district open space, CED has decided to investigate and examine the planning and engineering feasibility of enlarging the size of the reclamation from the original proposal of 6 ha to the proposal of 25 ha between the proposed Ting Kau and Sham Tseng Sewage Treatment Works and Tsing Lung Tau.

The Sham Tseng Development Project (the Project) is currently proposed to comprise an approximately 15.2 ha of reclamation along the coast between the proposed Ting Kau and Sham Tseng Sewage Treatment Works and Tsing Lung Tau. The reclamation is intended to provide land for residential development to meet the estimated housing demand after 2000 / 2001.

*1.2**STUDY PROGRAMME*

The Assignment has been divided into two separate stages. Each stage was scheduled to last for nine months. Stage 1 which commenced in April 1998 involved initial planning and engineering studies, broad assessment of associated environmental impacts of the Project and proposed preliminary mitigation measures to confirm the acceptability of the impacts. The Planning - Stage 1 Report was issued in December 1998.

Stage 2 of the Study commenced in April 1999. It examined in more detail the engineering works including the preparation of the preliminary design, review and updated the recommendations of Stage 1 Planning Study, reviewed, updated and undertook detailed assessment of the associated environmental impacts of the Project found in Stage 1, and refined and recommended the necessary environmental mitigation measures and monitoring and audit requirements in detail.

### 1.3

#### OBJECTIVES OF THE EIA STUDY

As stated in the Study Brief (the *Brief*), the objectives of the EIA Study are as below:

- to describe the Project and associated works together with the requirements for carrying out the Project;
- to identify and describe the elements of the community and environment likely to be affected by the Project, and / or likely to cause adverse impacts upon the Project, including both the natural and man-made environment;
- to identify and quantify emission sources and determine the severity of impacts on sensitive receivers and potential affected uses;
- to identify and quantify any environmental impacts associated with the future land uses of the proposed reclamation and recommend appropriate mitigation measures;
- to identify and quantify any potential losses or damage to flora, fauna and natural habitats;
- to identify and quantify the potential ecological and fisheries impacts associated with the Project;
- to identify existing landscape and visual quality in the Study Area so as to evaluate the landscape and visual impacts of the Project;
- to propose the mitigation measures so as to minimise pollution, environmental disturbance and nuisance during construction and operation of the Project;
- to identify, predict and evaluate the residual (that is, after practicable mitigation) environmental impacts and cumulative effects expected to arise during the construction and operation phases of the Project in relation to the sensitive receivers and potential affected uses;
- to identify, assess and specify methods, measures and standards, to be included in the detailed design, construction and operation of the Project which are necessary to mitigate these impacts and reduce them to allowable levels within established standards / guidelines;
- to identify and justify the need for environmental monitoring and audit and to define the scope of the requirements necessary to ensure the implementation and the effectiveness of the environmental protection and pollution control measures adopted;
- to investigate the extent of side-effects of proposed mitigation measures that may lead to other forms of impacts;
- to identify constraints associated with the mitigation measures recommended in the Assignment;
- to identify any additional studies necessary to fulfil the objectives to the requirements of this EIA Study; and

- to check if the proposed waterworks fall within the Potential Hazard Installations (PHI) consultation zone and recommend mitigation measures notwithstanding that the proposed works may be outside the Site.

### 1.3.1 *Stage 1 Environmental Assessment Objectives*

In Stage 1 an Environmental Assessment (EA) was undertaken to determine the feasibility of the proposed reclamation and developments in the reclaimed area and to broadly recommend feasible mitigation measures. The Stage 1 Environmental Assessment Study focused on the issues which had a bearing on the acceptability of proposed developments, the cumulative impacts on the environment (including impacts arising from both the existing and the proposed developments) and the residual impacts after the implementation of proposed broad mitigation measures. The Stage 1 Environmental Assessment Study also assessed the appropriateness of the proposed scale of reclamation and developments in terms of water quality, hydraulics, plus cumulative and residual impacts on the environment.

The EIA Study Team maximised the use of in-house existing databases and literature, and reviewed information provided in previous studies, including *Ting Kau and Sham Tseng Sewerage Scheme Environmental Impact Assessment Study*<sup>(1)</sup>, to undertake background / baseline studies. The EIA Study Team also employed suitable analytical and modelling tools to meet the objectives of the Stage 1 EA Study. The assessment was quantified, wherever possible, to a level sufficient to:

- confirm the environmental acceptability of the proposed developments;
- recommend feasible mitigation measures; and
- evaluate residual environmental impacts (that is, after mitigation) to comply with established standards and guidelines.

### 1.3.2 *Stage 2 EIA Objectives*

In Stage 2 an EIA Study was carried out to address the following:

- any necessary updating of the Stage 1 Environmental Assessment Study and all detailed proposals on mitigation measures;
- outline a programme by which the environmental impacts of the proposed developments and infrastructure projects could be assessed, monitored and audited; and
- to assess the cumulative environmental impacts associated with the Project and other adjacent concurrent projects, based on the updated planning and preliminary engineering design information.

The purpose of this Stage 2 EIA Study is to provide more detailed information on the nature and extent of environmental impacts arising from the implementation of the proposed developments, infrastructure and all related activities.

(1) The Ting Kau and Sham Tseng Sewerage Scheme, Environmental Impact Assessment Study, *Final Report Volumes 1 and 2*, October 1995.

Under the Environmental Impact Assessment Ordinance (EIAO), Environmental Permits (EPs) are issued prior to the construction of a Designated Project (DP). Under the EIAO, a person shall not construct or operate a DP listed in the Schedule 2 without an EP for the project unless it is exempt under Section 9(2) of the Ordinance.

The Sham Tseng Development (STD) Project is an engineering feasibility study of an urban development project with a Study Area covering more than 20 ha and is, therefore, considered as a DP under item 1 of Schedule 3 "Major Designated Projects Requiring Environmental Impact Assessment Reports". The Project contains various Schedule 2 DPs that under the EIAO require EPs to be granted by EPD before they may be either constructed or operated. *Table 1.4a* summarises the four individual Schedule 2 DPs in this Project.

**Table 1.4a** *Schedule 2 Designated Projects involved in the Sham Tseng Development under the EIAO*

Designated Project	EIAO Reference	Remarks
Reclamation works (15.2 ha)	Schedule 2, Part I, C.1	Reclamation more than 5 ha in size including dredging of marine basin, pier structures and berthing facilities
Sham Tseng Bypass	Schedule 2, Part I, A.1	A primary distributor
Sewage Pumping Station (with installed capacity more than 4500 m <sup>3</sup> per day)	Schedule 2, Part I, F.3	With an installed capacity of more than 2000 m <sup>3</sup> per day and a boundary less than 150 m from the planned residential area and schools
Underpass below Castle Peak Road (about 370 m long)	Schedule 2, Part I, A.9	It is a road fully enclosed by decking above and by structure on the sides for more than 100 m

It is understood that CED intend to apply for EPs for the construction of the 15.2 ha reclamation, construction and operation of the Sham Tseng Bypass, the underground sewage pumping station and the Castle Peak Road Underpass with reference to the assessment undertaken in this EIA Final Report. In case where direct application for environmental permit is justified as for similar facilities previously approved inside the EIAO, in particular for underground sewage pumping station, such an application may be made where applicable. Other Project infrastructural works that are not considered as DPs comprise:

- The Sewage Treatment Facilities for Sham Tseng Development (STFSTD) is not considered as a DP under Schedule 2, Part I, F.2 as the installed capacity will be about 4600 m<sup>3</sup> per day (less than the 5000 m<sup>3</sup> per day as specified in the EIAO).
- The construction and operational impacts of the planned sewage outfall, which has been assessed and reported in the *Final Assessment Report, Ting Kau and Sham Tseng Sewerage Scheme, EIA (1995)*, has been registered under the EIAO (EIA-077/BC). The proposed combined sewage outfall, which replaces the planned sewage outfall to handle additional sewage loading from the population above the STD, will not generate further adverse environmental impacts during construction and operation (*Annex I*). Thus, it is not considered as a 'material change' under the EIAO.

The following sets out the structure of this Final Report:

- *Section 2* illustrates the Project location, the scope of development, the Study Area, the works programme and the development options above the proposed reclamation;
- *Section 3* identifies and assesses the potential hydrodynamic and water quality impacts associated with the construction and operation of the proposed infrastructure and development of the Project. This section involves hydrodynamic modelling of the proposed reclamation and construction and operational water quality modelling of the sewage discharge from the committed Ting Kau and Sham Tseng Sewage Treatment Works (TKSTSTW) and Sewage Treatment Facilities for Sham Tseng Development;
- *Section 4* identifies and assesses the potential noise impacts associated with the construction and operation of the proposed Sham Tseng Bypass, access roads, Sewage Treatment Facilities for STD, pumping stations, etc, above the reclamation, and recommends mitigation measures to comply with established noise standards, wherever necessary;
- *Section 5* identifies and assesses the potential air quality impacts associated with the construction and operation of the proposed infrastructure and development of the Project, with focus on the construction dust impact, and operational traffic exhaust gas emission from the proposed Sham Tseng Bypass and odour emissions from the Garden Bakery;
- *Section 6* identifies and assesses the potential solid waste impact and management associated with the construction and operation of the proposed infrastructure and development of the Project, and recommends mitigation measures to reduce solid waste arisings, maximise recycling and to comply with established standards;
- *Section 7* identifies and evaluates the potential visual and landscape impacts associated with the construction and operation of the proposed infrastructure and development of the Project, and recommends mitigation measures to comply with established standards;
- *Section 8* identifies and assesses the potential marine ecological impacts associated with the construction and operation of the proposed infrastructure and development of the Project;
- *Section 9* identifies and assesses the potential fisheries impacts associated with the construction and operation of the proposed infrastructure and development of the Project;
- *Section 10* reports the findings of marine archaeological investigation that was undertaken to identify any marine archaeological resources within the construction site of the STD (*Annex J* includes the Marine Archaeological Investigation Report);
- *Section 11* reviews the potential land use impact upon the existing land use arrangement arising from the STD implementation;
- *Section 12* assesses the potential risk of biogas release from marine bottom sediment that is proposed to be left in place beneath the reclamation, and

recommends protection measures (*Section 12.9.2*) and precautions during construction (*Section 12.9.3*);

- *Section 13* presents the Environmental Monitoring and Audit (EM&A) requirements. The scope and approach are explained in detail in the stand-alone *EM&A Manual*.
- *Section 14* summarises and concludes the findings of environmental impact assessment, including *Table 14.1a Implementation Schedule*.

Volume 2 of the this Final Report includes:

- *Annex A: Results Of Marine Bottom Sediment Analysis;*
- *Annex B: Water Quality Objectives And Standards For The Western Buffer, Victoria Harbour Phase I And North Western Water Control Zones;*
- *Annex C: Derivation Of Sediment Loss Rate And Settings Of Water Quality Model;*
- *Annex D: Construction Water Quality Modelling Results;*
- *Annex E: Operational Water Quality Modelling Results;*
- *Annex F: Plant Inventory And Construction Noise Calculation;*
- *Annex G: Details Of Noise Sensitive Receivers And Traffic Noise Calculation;*
- *Annex H: Chimney Data, Odour Strength Information And Construction Dust Emission Rate Calculation;*
- *Annex I: Construction Noise, Water Quality and Operational Water Quality Assessment of the proposed new 800 mm diameter sewage outfall from the Ting Kau and Sham Tseng Sewage Treatment Works;*
- *Annex J: Marine Archaeological Investigation Report.*

The Chinese and English versions of the *Final EIA - Executive Summary* have also been prepared to summarise the overall findings of this Final Report.