Project Profile

For

Expansion of Shek Wu Hui Sewage Treatment Works

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

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1. Basic Information

1.1 Project Title

The title of this project is "Expansion of Shek Wu Hui Sewage Treatment Works" (hereinafter referred to as the "Project").

1.2 Purpose and Nature of Project

At present, Shek Wu Hui Sewage Treatment Works (SWHSTW) provides treatment to the wastewater generated from Fanling/Sheung Shui areas before discharging it into Mai Po Inner Deep Bay Ramsar Site through River Indus and Shenzhen River, thus helps protecting the water quality of River Indus, Shenzhen River and Mai Po Inner Deep Bay Ramsar Site.

This Project aims to expand the treatment capacity of the existing SWHSTW to cope with the increasing wastewater flows and loads as a result of the population growth in the catchment area of Fanling/Sheung Shui and the committed extension of sewerage system to unsewered areas. Upon completion of the Project, the treatment capacity of SWHSTW will increase from an average Dry Weather Flow (DWF) of 80,000 m^3/day to 93,000 m^3/day. The general layout of the SWHSTW upon project completion is shown in **Figure No. 1** while the key elements are listed below:

a) Construction of two flow division pump pits, one bioreactor, two final sedimentation tanks, a return activated sludge (RAS) / surplus activated sludge (SAS) pumping station, a dangerous goods storeroom, a air blower house, two sludge conditioning tanks and the sludge dewatering house extension;

b) Modifications of sludge thickening and dewatering facilities; and

c) Installation of electrical and mechanical (E&M) equipment for the above proposed treatment facilities and replacement of some E&M equipment in the existing treatment facilities.

This Project Profile for material change to an exempted designated project includes the assessments on the potential environmental impacts associated with the Project. The findings of the assessment are summarized in the following sections of this Project Profile while the details of the assessment are presented in the attached Annexes 1 - 5:

Annex 1 - Air Quality Impact Assessment

Annex 2 - Water Quality Impact Assessment

Annex 3 - Assessment of Impact to Waste Management

Annex 4 - Noise Impact Assessment

Annex 5 - Assessment of Landscape and Visual Impact

1.3 Name of Project Proponent

Sewerage Projects Division, Drainage Services Department

1.4 Location and Scale of Project and History of Site

1.4.1 Location of Project

The Project site is located at Chuk Wan Street of Shek Wu Hui adjacent to Sheung Shui Slaughter House. It is located partly within the existing SWHSTW compound and partly in a piece of vacant government land to the north of the existing SWHSTW boundary as shown in **Figure No. 1**.

1.4.2 Scale of Project

The general layout of the SWHSTW upon completion of the Project is shown in **Figure No. 1**. The scale of the Project is relatively small. The existing SWHSTW occupies about 95,000 m^2 while the proposed area for the Project is only about 5,000 m^2. The heights of the major structures are shown in **Figure No.1**.

1.4.3 History of Site

The existing SWHSTW and the proposed area for the Project fall within the Fanling/Sheung Shui Outline Zoning Plan (OZP). The existing SWHSTW was constructed as part of the Sheung Shui new town development in the early 1980s. Prior to the development, the land for the existing SWHSTW and the proposed area was a farmland.

1.5 Number and Types of Designated Projects to be Covered by the Project Profile

In accordance with Section 9(2)(g) of the Environmental Impact Assessment Ordinance (EIAO), the Shek Wu Hui sewage treatment works is an exempted designated project as the existing Shek Wu Hui sewage treatment works had been in operation before the EIAO came into effect on 1 April 1998. However, since the proposed works involves physical expansion and alternation to the existing Shek Wu Hui sewage treatment work and may cause adverse environmental impacts if mitigation measures are not in place, it shall be considered as a project constituting a material change to an exempted designated project under Schedule 2 of EIAO. Hence, the procedures under the EIAO should be followed and an environmental permit is required prior to the commencement of the expansion works.

1.6 Name and Telephone Number of Contact Person

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2. Outline of Planning and Implementation Programme

2.1 Project Implementation

The Project is delivered by DSD using In-house resources. The Sewerage Projects Division and Electrical and Mechanical Projects Division are responsible for the planning, design and construction supervision of the Project, while the Sewage Treatment Division 1 and Hong Kong & Islands Division will operate and maintain the completed works. The project management is carried out by the Sewerage Projects Division.

The Project is currently under the detailed design stage. The construction works are scheduled to commence in October 2005 for completion in early 2009.

2.2 Interactions with Other Projects

There are no major projects in the vicinity of the SWHSTW with overlapping implementation programme that will have significant environmental impacts due to cumulative effects.

3. Major Elements of the Surrounding Environment

The purpose of this section is to outline the existing and planned sensitive receivers (which might be affected by the Project) and the major elements of the surrounding environment (which may affect the Project).

3.1 Existing Sensitive Receivers and Sensitive Parts of Natural Environment

The study area is defined by a distance of 500m from the boundary of the project. Within the study area, representative sensitive receivers have been identified in accordance with the criteria set out in the EIAO TM. The representative sensitive receivers are listed in **Table 1** and their location is shown in **Figure No. 2**.

Table 1: Existing Sensitive Receivers (SR) in vicinity of SWHSTW

SR No.	Description	Type of Use	No. of Storeys	Distance between ASR and plant boundary (m)
SR1	Ancestor of Liu Temple (Tak Yeung Tong)	Worship	1	373
SR2	Fu Tei Au Tsuen	Residential	3	321
SR3	Fu Tei Au Tsuen	Residential	3	305
SR4	Warehouse/Trading area (with Ka Lei Warehouse, Sheung Shui Trading and Cambridge Plaza)	Industrial	5	31
SR5	Sheung Shui Heung Sitting Out Area and Basketball Court	Open Space	-	110
SR6	Wai Loi Tsuen	Residential	3	104
SR7	Temporary Domestic Structure	Residential	2	170

3.1.1 Residential Developments

The nearest residential areas are the Fu Tei Au Tsuen, the Wai Loi Tsuen and a temporary domestic structure, which are about 300m, 100m and 170 from the SWHSTW boundary respectively.

3.1.2 Place of Worship

There is a place of worship named Ancestor of Liu Temple (Tak Yeung Tong), which is about 370m north of the proposed area.

3.1.3 Recreational Facilities

There is a recreational open space called Sheung Shui Heung Sitting-out Area and Basketball Court, which is about 100m north-east of the existing SWHSTW boundary.

3.1.4 Industries

There is a warehouse/trading area, which is about 30m north-east of the existing SWHSTW boundary.

3.2 Planned Sensitive Receivers and Sensitive Parts of Natural Environment

Within the study area, representative sensitive receivers have been identified in accordance with the criteria set out in the EIAO TM. There are no planned sensitive receivers in the vicinity of the SWHSTW which will be affected by the Project.

3.3 Major Elements of the Surrounding Environment Affecting the Project

There are no major elements of the surrounding environment affecting the Project.

4. Possible Impacts on the Environment

4.1 Possible Environmental Impacts During Construction Stage

4.1.1 Air Quality

Fugitive dust from construction activities is the major concern of air quality impact during construction stage. Dust will be generated from construction activities including earthworks, construction of superstructures and substructures, demolition of existing structures, handling and transportation of construction and demolition materials, wind erosion of open sites and stockpiling areas and site reinstatement.

4.1.2 Water Quality

Construction site surface runoff will be generated from erosion of exposed bare soil and earth, earthworks and stockpiles during storm events. Wastewater will also be generated from the construction work force.

4.1.3 Waste Generation

Construction activities will generate various types of waste, including wood, timber and bamboo from formwork and falsework, and waste concrete from on-site concreting and demolition of the existing structures. The workforce on site will also generate general refuses comprising food scraps, paper and empty containers, etc.

4.1.4 Noise

The major sources of construction noise are associated with the use of powered mechanical equipment such as dump trucks, breakers, excavators, mobile cranes, air compressors and generators, etc.

4.1.5 Landscape and Visual

The major landscape impact is the disturbance of the vegetation (mainly shrubland/grassland and small/young trees) within the Project site while the major visual impact is the presence of the construction plants/materials entering and leaving the site and the structures being constructed.

4.1.6 Cultural Heritage

Cultural heritage may arise from site excavation for construction of the proposed treatment facilities.

4.1.7 Hazards

The Shek Wu Hui STW expansion site falls within the 1000m consultation zone of the Sheung Shui Water Treatment Works. However, referring to the Water Supplies Department' s "Reassessment of Chlorine Hazard for Eight Existing Water Treatment Works – Sheung Shui Water Treatment Works", the consequential increase of hazard level for Sheung Shui Water Treatment Works due to the Shek Wu Hui STW expansion project will be insignificant in view of the following factors:

(i) The number of Operation & Maintenance staff in Shek Wu Hui STW will remain the same;

(ii) The Shek Wu Hui STW expansion project is a medium size project and the expected construction workforce during normal construction period (7:00a.m. to 7:00p.m.) will be less than 100; and

(iii) The Sheung Shui Water Treatment Works is over 650m away from Sheung Shui Hui STW.

In view of the above, no adverse impact from hazard point of view is anticipated for the implementation of the Project.

4.2 Possible Environmental Impacts During Operation Stage

4.2.1 Air Quality

Odour emission is the major concern during operation stage. As the treatment capacity of SWHSTW will be increased from the present 80,000 m^3/d to 93,000 m^3/d (DWF) and new components will be added upon commissioning of the Project, there may be a greater odour impact to the nearby air sensitive receivers during operation of the Project.

4.2.2 Water Quality

Water quality impact may arise due to the increase in discharge flow of treated effluent.

4.2.3 Waste Generation

Additional screenings, grits and digested sludge will be generated due to the increase in sewage flow to be treated.

4.2.4 Noise

The E&M installations for the proposed treatment facilities of the Project such as pumps, air blowers and exhaust fans are the potential noise sources.

4.2.5 Landscape and Visual

The major visual impact during operation is the presence of the completed sewage treatment facilities.

4.2.6 Ecology

Possible ecological impacts include those to the species of ecological interest at the Project site and that at Mai Po Inner Deep Bay Ramsar Site due to hydrodynamic impact and the additional effluent discharge from the expanded SWHSTW.

5. Summary of Environmental Impact Assessment Results, Environmental Protection Measures to be Incorporated in the Design and Further Environmental Implications

5.1 Construction Stage

5.1.1 Air Quality

Given the small scale of the construction works and the considerable distance of the works site from existing ASRs, the construction phase dust impacts were qualitatively assessed. Mitigation measures stipulated in *Air Pollution Control (Construction Dust) Regulation*, such as water spraying, covering of dusty materials by impervious sheeting, provision of vehicle washing facilities and construction vehicle speed

restriction were recommended. With the implementation of the mitigated measures, dust nuisance at sensitive receivers will not be significant.

5.1.2 Water Quality

Clauses will be incorporated into the contract requiring the Contractor to comply with the relevant control/mitigation measures recommended in the *Practice Note for Professional Persons on Construction Site Drainage, Professional Persons Environmental Consultative Committe, 1994* (such as the use of sediment traps, wheel washing facilities for vehicles leaving the site, adequate maintenance of drainage systems to prevent flooding and overflow, sewage collection and treatment, and comprehensive waste management procedures, etc.). The requirements of the *Water Pollution Control Ordinance* should also be observed. With the implementation of control/mitigation measures, no residual impacts to water quality were predicted during the construction phase of the Project.

5.1.3 Waste Generation

Key issues are the handling and disposal of solid wastes produced such as C&D materials, general refuse and chemical wastes. The estimated volumes of C&D materials generated are summarized in **Table 2** below, together with the estimated volumes of C&D materials to be disposed to public filling facility designated by Public Fill Committee (PFC) of CEDD and that of C&D wastes to landfill.

Table 2: Summary of C&D Materials (In Bulk Volumes)

Construction Activities	C&D Materials (m^3)	Inert C&D material to be reused on site (m^3)	C&D waste to be disposed to landfill (1) (m^3)	Inert C&D material to be disposed to public filling facility designed by PFC (m^3)
Excavation works	29,000	2,000	-	27,000
Demolition of existing facilities	600	-	50	550
Total	29,600	2,000	50	27,550

Note:

(1) The estimated amount of general refuse produced is considered minimal when compared with the waste generated from the demolition works and is deemed to be included in the estimated amount of C&D waste to be disposed at landfill

Control measures will be implemented to avoid, reuse, recycle and dispose of C&D materials such as careful formulation of waste management plan and maintaining proper site management of waste. The requirements of *Waste Disposal Ordinance* and measures recommended in the prevailing technical circulars issued by Environment, Transport and Works Bureau should also be followed. No unacceptable environmental impacts will be resulted with respect to solid wastes.

5.1.4 Noise

An assessment of potential noise impact from the construction of the Project has been conducted and presented in Annex 4. Results indicate that, with the adoption of quiet PME and good site practices, the predicted construction noise levels would not exceed the relevant noise criteria.

5.1.5 Landscape and Visual

The vegetations within the Project site are mainly shrubland/grassland and small/young trees (of diameter 0.1m to 0.32m). From the tree survey conducted in December 2004 with the assistance of Landscape Unit of Highways Department, there are 150 existing trees within the Project site, among which 101 trees would be affected. The affected 101 trees (all are *Leucaena leucocephala*, which are of low amenity value and their survival rate after transplanting is low) will be felled, while the non-affected 49 trees (36 *Leucaena leucocephala*, 10 *Celtis sinensis*, 1 *Bombax malabaricum*, 1 *Acacia confusa* and 1 *Macaranga tanarius*) will be retained. The proposed tree felling plan is shown **Figure No. A5-1** of **Annex 5**. A tree felling and compensatory planting proposal has also been prepared. 112 new trees (28 *Cassia surattensis,* 54 *Melaleuca quinquenervia* and 30 *Sterculia lanceolata*) are proposed to be planted along the boundary of the Project site. The compensatory planting proposal is shown in **Figure No. A5-2** of **Annex 5**. Care will also be taken to retain and avoid damage to the existing trees.

The visual impact arising from the Project is negligible due to the considerable distance between the nearest sensitive receivers and the site, and the temporary nature of construction activities. Nevertheless, to further mitigate the visual impact of the construction process, hoarding will be erected at the site boundary as far as practicable. As such, no significant adverse landscape and visual impacts are anticipated.

5.1.6 Cultural Heritage

The project site was formed as part of the Sheung Shui new town development in the early 1980s and the land was a farmland prior to the development. The surrounding areas are mostly used for temporary storage and open space. According to the available information, it is noted that there is no listed archaeological site or historical buildings and features within/near the Project site. As such, no cultural heritage impact is expected in the works area.

5.2 Operation Stage

5.2.1 Air Quality

Odour dispersion modelling was carried out to predict the odour impact on sensitive receivers from the Project. Without mitigation measures, the predicted odour level at the nearest sensitive receivers under worst scenarios would exceed 5 odour units based on an averaging time of 5 seconds criterion as stated in the Annex 4 of the EIAO TM. Odour mitigation measures, mainly covering the inlet screw pumping station, grit channels, flume channels, effluent launder channels of primary sedimentation tanks and sludge holding tanks; and provision of de-odourizers for inlet screw pumping station and sludge holding tanks, are recommended. With the implementation of such mitigation measures, the cumulative impact of the Project is predicted to be in compliance with the odour criterion as stipulated in the EIAO TM.

5.2.2 Water Quality

The Project is designed to cater for increasing wastewater flow from the population growth within the catchment area of Fanling/Sheung Shui and committed extension of sewerage to unsewered areas. Upon commissioning of the Project and the mitigation measures of intercepting sewage from nearby unsewered villages to SWHSTW for treatment, the pollution loadings contributed by the unsewered areas and Shek Wu Hui STW would be reduced and this is in line with the "Deep Bay Zero Discharge Policy". The Project will further help to protect the water quality in Deep Bay.

5.2.3 Waste Generation

Sludge generated from the operation of the SWHSTW (including screenings, grits) will be disposed of at North East New Territories landfill. The total quantity of sludge is estimated to increase by about 17% (from the present 43 m^3/d to 52 m^3/d) upon commissioning of the Project. Such increase in quantity is considered minimal and will not cause any significant environmental impacts.

5.2.4 Noise

The noise impacts associated with the operation of the Project have been assessed. The assessment result indicated that the unmitigated operation noise levels predicated at representative NSRs would comply with both the daytime and nighttime criteria. Thus no adverse noise impact arising from the Project would be expected.

5.2.5 Landscape and Visual

The proposed treatment facilities will be in similar shape, size and appearance to the existing ones so as to achieve a tone of harmony and consistency. To further reduce visual impact, 112 new trees including 28 *Cassia surattensis*, 54 *Melaleuca quinquenervia* and 30 *Sterculia lanceolata* (i.e. not less than that lost due the this Project) will be planted to provide a shielding effect to the new facilities. The compensatory planting proposal is shown in **Figure No. A5-2** of **Annex 5**. Taking into account the isolated position of the Project and the considerable distance between the Project site and the sensitive receivers, the visual impact arising from the Project is negligible.

5.2.6 Ecology

According to the available information, it is noted there are no species of ecological interest within/near the Project site. In addition, there will not be any hydrodynamic impact on Mai Po Inner Deep Bay Ramsar Site due to the minimal increase in flow volume as compared with that of River Indus and Shenzhen River. With the mitigation measures of intercepting sewage from nearby unsewered villages to SWHSTW for treatment, the pollution loadings contributed by the unsewered areas and Shek Wu Hui STW would be reduced and this is in line with the "Deep Bay Zero Discharge Policy". The Project will further help to protect the water quality in Deep Bay. As a result, no adverse ecological impact is anticipated for the Project.

6. Environmental Monitoring and Audit (EM&A) Requirements

6.1 Although all construction impacts are short-term effects and no adverse effect would be anticipated on the environment with proposed mitigation measures in place, DSD has taken the initiative to implement a monitoring and audit programme during the construction phase to check on the implementation of the control measures.

6.2 An EM&A programme would be implemented in the aspects of water quality, noise, dust, odour and waste management as appropriate during construction and operation. Site inspection/audit would also be carried out. Details of the monitoring procedures, methodology and action plans will be stipulated in the E&MA manual, which will be submitted for approval later.

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