

Project Profile

for

Upgrading of Ting Kok Road Pumping Station No. 5

under

North District and Tolo Harbour Sewerage,

Sewage Treatment and Disposal

– High Priority Works

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

January 2005

Table of Contents

| | Page No. |
|---|----------|
| 1. BASIC INFORMATION | 1 |
| 1.1 PROJECT TITLE..... | 1 |
| 1.2 PURPOSE AND NATURE OF PROJECT..... | 1 |
| 1.3 NAME OF THE PROJECT PROPONENT..... | 1 |
| 1.4 LOCATION AND SCALE OF PROJECT AND HISTORY OF SITE..... | 1 |
| 1.5 NUMBER AND TYPES OF DESIGNATED PROJECT..... | 2 |
| 1.6 NAME AND TELEPHONE NUMBER OF CONTACT PERSON..... | 2 |
| 2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME | 2 |
| 3. POSSIBLE IMPACTS ON THE ENVIRONMENT | 2 |
| 3.1 POSSIBLE ENVIRONMENTAL IMPACTS DURING CONSTRUCTION OF PUMPING STATION AND DEMOLITION OF EXISTING STRUCTURES..... | 2 |
| (a) Dust..... | 2 |
| (b) Water Quality..... | 2 |
| (c) Noise..... | 3 |
| (d) Waste..... | 3 |
| (e) Leachate Contamination..... | 3 |
| (f) Landfill Gas..... | 3 |
| (g) Landscape and Visual..... | 3 |
| (h) Ecology..... | 3 |
| (i) Traffic..... | 3 |
| (j) Cultural Heritage..... | 3 |
| 3.2 POSSIBLE ENVIRONMENTAL IMPACTS DURING OPERATION STAGE OF PUMPING STATION..... | 4 |
| (a) Odour..... | 4 |
| (b) Water Quality..... | 4 |
| (c) Noise..... | 4 |
| (d) Waste..... | 4 |
| (e) Leachate Contamination..... | 4 |
| (f) Landfill Gas..... | 4 |
| (g) Landscape and Visual..... | 4 |
| (h) Ecology..... | 5 |
| (i) Traffic..... | 5 |
| (j) Cultural Heritage..... | 5 |
| 4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT | 5 |
| 4.1 EXISTING SENSITIVE RECEIVERS AND SENSITIVE PARTS OF NATURAL ENVIRONMENT..... | 5 |
| (a) Residential Development and Agricultural Area..... | 5 |
| (b) Ware House/ Industrial Building..... | 5 |
| (c) Recreational Facilities..... | 5 |
| 4.2 PLANNED SENSITIVE RECEIVERS AND SENSITIVE PARTS OF NATURAL ENVIRONMENT..... | 6 |
| 4.3 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT AFFECTING THE PROJECT..... | 6 |
| 5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND FURTHER ENVIRONMENTAL IMPLICATIONS | 6 |
| 5.1 DURING CONSTRUCTION STAGE OF PUMPING STATION AND DEMOLITION OF EXISTING STRUCTURES..... | 6 |
| (a) Dust..... | 6 |
| (b) Water Quality..... | 6 |
| (c) Noise..... | 7 |
| (d) Waste..... | 7 |
| (e) Leachate Contamination..... | 8 |
| (f) Landfill Gas..... | 8 |
| (g) Landscape and visual..... | 8 |
| 5.2 DURING OPERATION STAGE OF PUMPING STATION..... | 8 |
| (a) Odour..... | 8 |
| (b) Water Quality..... | 9 |
| (c) Noise..... | 9 |
| (d) Waste..... | 9 |
| (e) Landfill Gas..... | 9 |
| (f) Landscape and Visual..... | 10 |
| 5.3 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES..... | 10 |
| APPENDIX A | |
| APPENDIX B | |
| APPENDIX C | |
| APPENDIX D | |
| APPENDIX E | |

1. Basic Information

1.1 Project Title

North District and Tolo Harbour Sewerage, Sewage Treatment and Disposal – High Priority Works - Upgrading of Ting Kok Road Pumping Station No. 5.

1.2 Purpose and Nature of Project

Upgrading of Ting Kok Road Pumping Station No. 5 under North District and Tolo Harbour Sewerage, Sewage Treatment and Disposal – High Priority Works is implemented based on the findings of the Study “Review of North District and Tolo Harbour Sewerage Master Plan”. The purpose of the project is to upgrade the existing Ting Kok Road Pumping Station No. 5 to cope with the sewerage needs of both existing and future developments along Ting Kok Road East of Tai Po Industrial Estate up to Tai Mei Tuk.

1.3 Name of the Project Proponent

Drainage Services Department is the works department and Environmental Protection Department is the client department.

1.4 Location and Scale of Project and History of Site

Plans showing the location of the project and the general layout of the pumping station are attached in Appendix A. The site is situated next to the Tai Po East Fire Station, Shuen Wan Landfill and the Tai Po Sewage Treatment Works.

The design flow of the existing pumping station is projected to increase from 2,888 m³/day to 11,520 m³/day. The scope of works of the project comprises the following works:

- (a) construction of a new pumping station of a design capacity of 11,520 m³/day in the vicinity of the Tai Po East Fire Station;
- (b) installation of 350m length of 450mm diameter twin rising mains and 250m length of 600mm diameter gravity sewers extending to the Tai Po Sewage Treatment Works; and
- (c) demolition of the existing structures upon commissioning of the new pumping station.

Existing structures to be demolished include gravity sewers, manholes, a pump pit and its associated E&M control panel. No demolition of any existing transformer room/house, diesel generator and fuel tank room are required under the project

The project site is within a “Government, Institution or Community” Zone and an “Other Specified Uses” annotated “Golf Course” Zone on the Tai Po Outline Zoning Plan (OZP). It is partly within the boundary of the restored Shuen Wan Landfill and is accessible through vehicular access from Ting Kok Road.

1.5 *Number and types of Designated Project*

There are six village houses located about 60m away from the boundary of the proposed pumping station. The proposed pumping station upgrading works therefore constitutes a Designated Project under type F.3(b)(i) in Schedule 2 of the Environmental Impact Assessment Ordinance.

1.6 *Name and Telephone Number of Contact Person*

Ir S C LAU
Engineer, Sewerage Projects Division, Drainage Services Department
Tel. No.: 2594 7454
Fax. No.: 2827 8700

2. **Outline of Planning and Implementation Programme**

The Sewerage Projects Division and the Electrical & Mechanical Projects Division of the Drainage Services Department will carry out the design and construction supervision of the Project. The Building Civil Maintenance Team, Sewage Treatment 1 Division and Mainland North Division of the Drainage Services Department will operate and maintain the completed works.

Planning and design process of the proposed works has commenced since February 2004. Allowing time for statutory procedures, construction works would commence in August 2005 for completion by December 2007.

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

3. **Possible Impacts on the Environment**

3.1 *Possible Environmental Impacts During Construction of Pumping Station and Demolition of Existing Structures*

(a) Dust

Dust may be generated from construction activities such as excavation, construction of new pumping facilities and demolition of the existing structures.

(b) Water Quality

Potential impact may arise from leachate migrating from the landfill, runoff and erosion of exposed soil, earthworks and stockpiles during storm events. Wastewater or contaminated runoff may also be generated from the construction activities such as dust suppression sprays, dewatering during excavation in landfill site and maintenance of construction equipment.

(c) Noise

Noise may be generated from construction activities such as mini-piling works, concrete breaking and excavation works. The equipment and plant likely to be used on site only involve a few numbers of air compressors, generators, hydraulic or pneumatic breakers, backhoes and other excavation plants.

(d) Waste

Construction and demolition (C&D) material and waste such as excavated spoil (soil and rock), concrete and unusable cement/grouting mixes, wood, metals scraps, equipment parts and packaging materials will be generated.

(e) Leachate Contamination

Close vicinity of the project site to the Shuen Wan landfill may suggest a possibility of contaminated soil material being excavated during construction works for substructure of pumping station, transformer room and associated rising mains and gravity sewers, if the soil is contaminated by leachate.

(f) Landfill Gas

Close vicinity of the project site to Shuen Wan Landfill may also suggest the possibility of landfill gas being released during excavation works for substructure of pumping station, transformer room and associated rising mains and gravity sewers.

(g) Landscape and Visual

Potential landscape and visual impacts may arise from the presence of existing trees, construction plant and materials, spoil heaps, site traffic and night-time lighting on site but these are of a temporary nature only.

(h) Ecology

No impact on ecology is expected during the construction stage.

(i) Traffic

This project does not involve excavation works on public roads. Only a small amount of traffic will be generated by the construction of the project and the impact on traffic in the area will be minimal.

(j) Cultural Heritage

No impact on historical monuments or buildings is expected during the construction stage.

3.2 Possible Environmental Impacts During Operation Stage of Pumping Station

(a) Odour

Potential odour emission from the wet well and discharge chamber of the pumping station is possible if no mitigation measure is incorporated into the design of the pumping station.

(b) Water Quality

Implementation of the project would enhance the water quality of the surrounding environment particularly the coastal area along Ting Kok Road and will not cause any adverse impact during normal operating conditions. In emergency situations such as prolonged power failure, sewage overflow bypass via the nearby stormwater drainage system into Tolo Harbour may occur as shown in Appendix B. However, with the implementation of preventive measures described below, the possibility of bypass will be extremely remote.

(c) Noise

Mechanical screens, pumps and the extraction fans of de-odourizers are potential noise sources during operation of the proposed pumping stations if no mitigation measure is incorporated into the design of the pumping station.

(d) Waste

Mechanical screens will be installed at the inlet of the pumping station to prevent large solid material in the sewage from entering the pumps and causing damage. Following the commissioning of the pumping station, a small quantity of screenings will be generated.

(e) Leachate Contamination

No adverse environmental impact from leachate contamination is envisaged during the operation stage.

(f) Landfill Gas

Landfill gas may migrate into and accumulate in confined space such as wet well and maintenance chambers of the pumping station. There may be hazards of explosion and asphyxiation during inspection and maintenance of the pumping station and chambers if no mitigation measure is incorporated.

(g) Landscape and Visual

To minimize landscape and visual impact of the proposed pumping station, landscaping and aesthetics will be a key factor to be considered in the design.

No significant adverse landscape and visual impacts are anticipated during the operation stage.

(h) Ecology

No impact on ecology is expected during the operation stage.

(i) Traffic

The delivery of materials and removal of screenings will be infrequent and will have insignificant impact on traffic flow in the area.

(j) Cultural Heritage

No impact on historical monuments or buildings is expected during the operation stage.

4. Major Elements of the Surrounding Environment

This section is to outline the existing and planned sensitive receivers that might be affected by the project. In addition, it also outlines the major elements of the surrounding environment that may affect the project.

4.1 Existing Sensitive Receivers and Sensitive Parts of Natural Environment

The locations of the existing sensitive receivers are shown in Appendix C.

(a) Residential Development and Agricultural Area

The Tai Po East Fire Station (SR1) situated next to the boundary of the proposed pumping station. In addition, there are six village houses with agricultural area (SR3) are at about 60m northwestern of the boundary of the pumping station.

(b) Ware House/ Industrial Building

There are an industrial building (SR2) situated within the Tai Po Industrial Estate which situated next the western side of the boundary of the pumping station. In addition, there is a ware house (SR4) for the Hong Kong Landfill Restoration Group Limited (restoration contractor for Shuen Wan Landfill site) which is about 20m to the east of the pumping station.

(c) Recreational Facilities

There is a Temporary Golf Course Driving Range facility (SR5) within Shuen Wan landfill site at about 500m to the southeastern side of the pumping station.

4.2 *Planned Sensitive Receivers and Sensitive Parts of Natural Environment*

There are no rezoning proposal and/or Section 16 planning application under the Town Planning Ordinance in the vicinity of the project site that would become planned sensitive receivers of the project site.

4.3 *Major Elements of the Surrounding Environment Affecting the Project*

There are no major elements of the surrounding environment affecting the location of the project.

5. **Environmental Protection Measures to be Incorporated in the Design and Further Environmental Implications**

5.1 *During Construction Stage of Pumping Station and Demolition of Existing Structures*

(a) Dust

The effect of dust generated from the construction works is expected to be insignificant with the implementation of proper mitigation measures. The impact will be minimized by the adoption of proper working methods such as regular water spraying and providing wheel-washing facilities. Relevant clauses will be incorporated into the contract documents in this regard.

(b) Water Quality

The construction activities in the project will include excavation, earthworks, demolition works and general concrete building works. The contractor will be required to provide, where necessary, a silt removal facility so as to remove any silt before discharge of site runoff into the nearby stormwater drains or sewers if necessary. The mitigation measures should be provided prior to the commencement of excavation. The design of temporary on-site drainage and silt removal facilities will follow the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94).

Another potential impact on water quality is due to the leachate from the Shuen Wan landfill. The approved EIA report for Tai Po Sewage Treatment Works Stage V project stated that there has been an ongoing monitoring of groundwater quality performed quarterly by EPD for the whole landfill site. From the 2003 results, TKN and COD was within the range of 0.1 - 3.4 mg/l and 2 - 400 mg/l respectively. A capping layer and a leachate extraction system has been installed at the landfill by EPD in order to control the flow direction and level of leachate, with the leachate collected in the extraction chambers through drain pipes pumped to the Tai Po Sewage Treatment Works directly. The EIA has concluded that leachate migration away from the landfill site was minimal. A location plan of groundwater monitoring wells in the landfill site is shown in Appendix D.

In addition, the groundwater quality results for the Groundwater Monitoring Well No. GW03 and GW04 for 2003 and 2004 in the vicinity of the project site are also attached in Appendix D. Consistent with the findings of the Tai Po Sewage Treatment Works EIA report, the TKN and COD of groundwater at GW03 and GW04 for 2004 was also within the range of 0.1 - 3.4 mg/l and 2 - 400 mg/l respectively. It is thus considered that there is no leachate migration from the landfill site to the project site.

The Contractor will be required to monitor groundwater quality through obtaining the groundwater monitoring results for Groundwater Monitoring Well No. GW03 and GW 04 from EPD during the construction stage. The Contractor has to check the groundwater monitoring results against the standards for effluents discharged into coastal waters of Tolo and Port Shelter Water Control Zones as stated in Table 7 of Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters under WPCO (attached in Appendix D). The extracted groundwater will be discharged via stormwater drains if none of the parameters in EPD's test results exceeds the limit in Table 7 of the Technical Memorandum. Otherwise, the groundwater will either be recharged to the adjacent ground or pumped to nearby sewers.

With the adoption of such mitigation measures, no adverse impact on water quality is expected in the course of construction.

(c) Noise

Common construction plants including backhoe, concrete mixer, vibratory poker, pneumatic breaker and the like will be used. It is anticipated that only minor noise impacts will be generated. The construction noise impact on nearby village houses, located about 60m from the boundary of the pumping station, would be largely screened off by the fire station and industrial buildings. Furthermore, temporary hoardings will be erected during construction of the pumping station to screen off any noise.

Construction activities will be carried out in daytime as far as possible (8:00 – 19:00). No construction works will be scheduled on Sunday and public holidays. The Contractor has to comply with the relevant regulations and the Noise Control Ordinance to limit the construction noise within the acceptable limit during the construction stage.

(d) Waste

The Contractor will be required to sort all C&D material and waste into different categories for disposal at public filling, landfills, or recycling as appropriate. The C&D material generated is about 6,000 m³ and is to be disposed of to the Public Filling Facility at Tuen Mun Area 38. No chemical waste is identified under the project.

(e) Leachate Contamination

The risk of leachate contamination in the project site is related to the possibility of presence of leachate in the site arising from the landfill. As described in Item 5.1(b) above, no leachate migration from the landfill site to the project site is concluded. Hence, no impact of leachate contamination is anticipated and no remediation action should be necessary.

(f) Landfill Gas

A landfill gas hazard assessment report has been prepared for EPD's vetting in accordance to the Practice Note for Professional Persons - Landfill Gas Hazard Assessment for Developments adjacent to landfills and EPD/TR8/97 Landfill Gas Hazard Assessment Guidance Note published by EPD, as the project site falls within the 250m Consultation Zone of Shuen Wan Landfill. The report was accepted by EPD in November 2004 and was attached in Appendix E. Recommended design and precautionary measures will be adopted to prevent landfill gas hazard during the construction phase.

(g) Landscape and visual

No endangered tree species is identified within the project site. Tree protection measures and transplanting will be adopted to prevent the damage of the existing trees during construction phase.

Any surplus C&D materials will be required to be removed off site promptly. In addition, a hoarding will be erected around the site area as far as practicable to minimize the potential impacts to pedestrians nearby.

5.2 *During Operation Stage of Pumping Station*

(a) Odour

To minimize the potential odour problem, the inlet chamber, screen chamber, wet well, etc will be located underground with cover, and enclosed by a reinforced concrete superstructure. In addition, a deodourizer with a forced ventilation system will be installed to remove odour. The exhaust of the deodourizer will be located in a direction away from the sensitive receivers, i.e. at the southeastern and southwestern sides of the pumping station. The proposed flow rate of the deodourizer will be within the range of 5 to 10 air change or $1\text{m}^3/\text{s}$ to $2\text{m}^3/\text{s}$ and the design discharge odour strength at the exhaust point will be no greater than 2 odour unit.

The proposed measures have been proven in many existing pumping stations such as Tai Yuen Sewage Pumping Station and Shui Wai Sewage Pumping Station to be effective in mitigating the potential odour impact.

(b) Water Quality

To minimize the potential impact on water quality arising from bypass of sewage to the Tolo Harbour as shown in Appendix B, one standby and two duty pumps, one standby and one duty mechanical screen, and about 1.5-hour emergency storage will be provided to cater for breakdown and maintenance of the duty pumps and mechanical screen respectively. In order to minimize the chance of power failure, a backup power supply in the form of a standby transformer and ring main supply will be provided by CLP. In addition, a telemetry system will also be provided in order to transmit signals showing irregularity or any operation problem of the pumping station to the existing Tai Po Sewage Treatment Works such that immediate actions can be taken in case of emergency. With these measures incorporated into the design of the pumping station, it is anticipated that the chance of emergency sewage bypass will be extremely remote.

As the emergency sewage discharge point is in the vicinity of the saltwater inlet plant of WSD, effective communication with WSD staff will be maintained. Advance notice to WSD staff in Tai Po Salt Water Pumping Station will be required in case of emergency by-pass to the Tolo Harbour.

(c) Noise

To minimize potential noise impact from the operating of the pumping station, all the pumps will be enclosed inside the infrastructure of the pumping station. Acoustic filters will be installed at the extraction fans of the de-odourizers if necessary. The treated air outlet and extraction fans of the deodourizer will be located as far as practicable appropriately to minimize disturbance to the nearby sensitive receivers, i.e. at the southeastern and southwestern sides of the pumping station. These proposed measures have been proven in many existing similar pumping stations such as Tai Yuen Sewage Pumping Station and Shui Wai Sewage Pumping Station to be effective in mitigating the potential noise impact

(d) Waste

The screenings of sewage at the inlet works of the pumping station will be enclosed in plastic bags or storage containers. This operation will be conducted inside the pumping station. The screenings would then be trucked to landfill for disposal. Therefore, it is anticipated that no adverse waste impact will arise.

(e) Landfill Gas

A landfill gas hazard assessment report has been prepared for EPD's vetting in accordance to the Practice Note for Professional Persons - Landfill Gas Hazard Assessment for Developments adjacent to landfills and EPD/TR8/97 Landfill Gas Hazard Assessment Guidance Note published by EPD, as the project site falls within the 250m Consultation Zone of Shuen Wan Landfill. The report was accepted by EPD in November 2004 and was attached in Appendix E. The

recommended precautionary design and monitoring measures will be adopted to prevent landfill gas hazard during the operational phase of the pumping station.

(f) Landscape and Visual

Landscape and aesthetics would be the major considerations in the design of the pumping station. Landscaping work will be provided to enhance the outlook of the pumping station. In addition, architectural aspects including colour scheme, types of external finishing and layout of the infrastructures will be carefully designed in order to match with the features of the surrounding environment. The structure will also be restricted to 2 storeys (not greater than 15m in height).

5.3 *Summary of Potential Environmental Impacts and Mitigation Measures*

The potential environmental impacts and proposed mitigation measures to be incorporated into the design and construction of the upgrading of Ting Kok Road Pumping Station No.5 are summarized in Table 1:

Table 1

| Project Stage | Potential Environmental Impact | Mitigation Measures | Relevant Section in the Project Profile |
|----------------------|---------------------------------------|--|--|
| Construction | Minor dust nuisance | Proper working method will be adopted and wheel-washing facilities will be provided. Control by contract specification | 5.1 (a) |
| | Water quality impact | (1) Control of construction surface run-off by ProPECC PN 1/94, EPD's Practice Note for Professional Persons, Construction Site Drainage. (2) Groundwater quality data will be obtained from EPD regularly and checked against relevant TM of WPCO. (3) Control by contract specification. | 5.1 (b) |
| | Minor noise impact | (1) Temporary hoarding will be erected. (2) Construction activities will be carried out in daytime. (3) Comply with relevant regulations and Noise Control Ordinance. (4) Control by contract specification | 5.1 (c) |
| | Minor waste impact | (1) C&D material and waste will be sorted on site. (2) C&D material will be disposed of to Tuen Mun Area 38. (3) Control by contract specification | 5.1 (d) |

| | | | |
|-----------|-----------------------------------|---|---------|
| | Landfill gas impact | The landfill gas hazard assessment report was prepared and accepted by EPD. The precautionary measures will be incorporated in contract specification. | 5.1 (f) |
| | Minor landscape and visual impact | (1) Tree protection measures and transplanting if necessary will be incorporated in contract specification. C&D waste will be removed off site. (2) Control by contract specification. | 5.1 (g) |
| Operation | Odour nuisance | (1) All odour sources will be enclosed. (2) De-odourizer will be installed to remove odour. (3) Control by contract specification. | 5.2 (a) |
| | Water quality impact | No impact during normal operation. Measures to minimize abnormal situations and the possibility of sewage bypass to Tolo Harbour: (1) Standby pump and mechanical screen will be provided. (2) Emergency storage capacity will be provided. (3) Back up power supply will be provided. (4) Telemetry system will be provided to send signals showing irregularity or any operation problem from the pumping stations to the Tai Po Sewage Treatment Works. (5) Advance notice will be given to WSD in case of emergency by-pass. (6) Control by contract specification. | 5.2 (b) |
| | Noise impact | (1) Pumps will be enclosed. (2) Acoustic filters will be installed to further reduce noise level of extraction fans if necessary. (3) Control by contract specification, | 5.2 (c) |
| | Waste generation | (1) Screenings will be enclosed. (2) Waste will be properly disposed of. (3) Control by contract specification. | 5.2 (d) |

| | | | |
|--|-----------------------------|--|---------|
| | Landfill gas impact | The landfill gas hazard assessment report has been prepared and accepted by EPD. The recommended safety and precautionary measures will be followed by contract specification. | 5.2 (e) |
| | Landscape and visual impact | (1) Greening and planting work. (2) Architectural aspects of the infrastructures, including colour scheme, types of external finishing and layout of the pumping station will be carefully designed taking into account the surrounding features and buildings. (3) The structure will be restricted to 2 storeys. | 5.2 (f) |

With the above-mentioned mitigation measures incorporated into the design and construction of the project, the proposed Upgrading of Ting Kok Road Pumping Station No.5 would cause insignificant impacts on the surrounding environment. In conclusion, the above preventive and mitigation measures are considered sufficient to mitigate the possible environmental impacts that may arise from the project.

END