Project Profile

for

Expansion and Extension of Fill Bank at

Tuen Mun Area 38

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Client : **Civil Engineering and Development Department**

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For and on behalf of CH2M-IDC Hong Kong Limited:

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1.2 PURPOSE AND NATURE OF THE PROJECT

Background

1.2.1 It is the government policy to make beneficial use of public fill (i.e. inert material such as excavated earth, building debris, broken rock and concrete which form a major portion of construction and demolition material (C&D material) generated by the local construction industry on a daily basis) generated by the construction industry. The beneficial use of public fill in reclamation and earth filling projects reduce the demand on general fill and help to conserve natural resources by reducing the demand on earth borrowing activities and marine sand extraction. Relevant Technical Circulars (TC), including WBTC No. 4/98 *Use of Public Fill in Reclamation and Earth Filling Projects,* WBTC No. 21/2002 *Trip-ticket System for Disposal of Construction and Demolition Material,* ETWB TC(W) No. 33/2002 *Management of Construction and Demolition Material Including Rock* and ETWB TC(W) No. 15/2003 *Waste Management on Construction Sites*, have been issued to promulgate the policy, as measures to maximise the reuse of public fill and minimise the incidences of illegal dumping.

1.2.2 The public filling capacity provided by reclamation projects were exhausted in recent years. Shortfall in public filling capacity from late 2002 to 2005 was anticipated. The Government therefore put forward the proposal to establish two temporary fill banks in both the Eastern and Western regions of the territory (at Tseung Kwan O Area 137 and Tuen Mun Area 38 respectively) for storage of public fill after review.

1.2.3 A Project Profile (Register No. PP-179/2002) (CH2M, Nov., 2002) was prepared for the fill bank at Tuen Mun Area 38 with an area of approximately 35 ha and the Authority has then granted Civil Engineering Department (CED) a permission to apply directly for an environmental permit on 16 January 2003. Accordingly, pursuant to Section 10 of the Environmental Impact Assessment Ordinance (EIAO), an environmental permit (No. EP-153/2003) was granted to Civil Engineering Department (CED) on 13 February 2003 for construction and operation of the fill bank in Area 38, Tuen Mun for temporary storage of public fill. "Operation" includes stockpiling as well as removal of public fill material as described in the environmental permit. The provision of the fill bank allows public fill to be stored when the demand on public fill is low to optimise their beneficial reuse in reclamation and earth filling projects when the demand is high. The fill bank at Tuen Mun Area 38 commenced operation in June 2003. Another fill bank at Tseung Kwan O Area 137 already commenced its operation in October 2002.

1.2.4 In order to increase the throughput of public fill transfer by a marine route for the fill bank at Tuen Mun Area 38, CED applied to vary the environmental permit on 15 October 2003 (Application No. VEP-117/2003) by:

- extending the barge berthing length from about 300m to about 400m to allow public fill to be unloaded concurrently with 6 barges berthing at the seafront, instead of the 4 barges assumed in the Project Profile;
- allowing public fill intake by barges and their delivery to the stockpiling area before 0800 hour in the morning and after 2000 hour in the evening and night-time periods (in other words, public fill intake by barge and associated operation is allowed 24 hours a day); and

- providing a public filling barging point (PFBP), in form of a tipping hall, in the south-western end of the fill bank site before hand over this site area for the Recovery Park Phase I construction.

1.2.5 Pursuant to Section 13 of the Ordinance, the Director amended the environmental permit to EP-153/2003/A on 30 October 2003 based on the application.

1.2.6 With the recent cancellation and deferral of some planned reclamation projects, however, the demand of public fill has greatly reduced. Reclamation projects like the Wanchai Development Phase II and the Southeast Kowloon Development are currently under review. The situation with shortfall in public fill demand is anticipated to continue.

1.2.7 The Deputy Director of the State Oceanic Administration (SOA), Mr Chen Lian-zeng and the Secretary for the Environment, Transport and Works, Dr Sarah Liao, signed a Cooperation Agreement on Cross-boundary Marine Dumping on 31 March 2004. The Cooperation Agreement provides a foundation for closer cooperation and communication between the two sides on the management of cross-boundary dumping of dredged materials generated in Hong Kong, and the accommodation of inert C&D materials in Mainland waters. With the fast economic development in Guangdong, there are many reclamation works along the coastal areas of the Pearl River Delta. These works can make greater use of Hong Kong's fill and C&D materials so as to reduce the exploitation of land in these areas.

1.2.8 Under the Cooperation Agreement, both sides agreed that the HKSAR Government may, with reference to the needs of one or more projects, submit proposals to the Central People's Government for cross-boundary dumping of dredged materials and utilisation of inert C&D materials. However, the proposals submitted must comply with the relevant regulations and standards of both the Mainland and Hong Kong. The two sides will also further discuss on the technical issues involved in implementing the Cooperation Agreement.

1.2.9 On the above basic, Civil Engineering and Development Department (CEDD) has put forward an export scheme (exportation of C&D materials from HKSAR to Mainland) and aim at implementing the export scheme from mid 2005. The existing fill bank at Tuen Mun Area 38 will serve as a base for export to Mainland and to maintain a stable outlet for disposal of public fill in the western part of the Territory.

1.2.10 In order to provide a buffer to cater for the unforeseen circumstances such as delay in implementation of export scheme, it is proposed to expand the stockpiling area of the fill bank at Tuen Mun Area 38 to include about 2.2 ha of area immediate to the south of the existing Construction and Demolition Material Recycling Facility (C&DMRF) from early 2005 onwards. It is also proposed to increase the maximum stockpiling height from +35mPD to +40mPD. The maximum stockpiling capacity will be increased from 4.9 million cubic metres (Mm^3) (8.8M tonnes) to 5.1 Mm^3 (9.2M tonnes).

1.2.11 Moreover, the operation of the fill bank at Tuen Mun Area 38 with concurrent operation and removal activities will be extended to March 2009.

1.2.12 By virtue of C.11 in Section C *Reclamation, Hydraulic and Marine Facilities, Dredging and Dumping* in Schedule 2, Part I of the EIA Ordinance which specifies that a public dumping area of not less than 2 hectare in size is a designated project (DP), the proposed fill bank at Tuen Mun Area 38 is classified as a DP.

1.2.13 The proposed expansion of the existing fill bank at Tuen Mun Area 38 involves a change in the alignment of the site boundary and the layout of the stockpile which results in increase in stockpiling capacity. The extension of the existing fill bank involves the change of the scale of the project. This change may result in increase in pollution emission and is therefore regarded as a material change to a designated project.

1.2.14 This Project Profile is prepared to enable the Authority to determine whether the project proponent can proceed directly to apply for an environmental permit for the proposed expansion and extension of the fill bank at Tuen Mun Area 38.

Do-Nothing Scenario

1.2.15 Without the proposed expansion and extension of the fill bank at Tuen Mun Area 38, Hong Kong will be left without any public filling facility in western part of the Territory after the original operational phase of the fill bank ends in March 2005. As a result, a large quantity of reusable public fill generated by the construction industry may need to be disposed of to landfills. The landfill spaces are expensive and designed for disposal of municipal waste and have been used up far more rapidly than originally planned for. Disposal of reusable public fill at the landfills should therefore be avoided as far as practicable.

1.2.16 The fill bank at Tuen Mun Area 38 mainly serves the construction sites located in the western part of the Territory. In the absence of the fill bank at Tuen Mun Area 38, truck flow at Lung Mun Road may still increase since it is also the major route to WENT landfill if delivery of C&D material to landfills becomes inevitable.

1.3 NAME OF THE PROJECT PROPONENT

1.3.1 Civil Engineering and Development Department (CEDD)
Fill Management Division
5/F., Civil Engineering and Development Building
101, Princess Margaret Road
Homantin, Kowloon
Hong Kong

1.4 LOCATION AND SCALE OF THE PROJECT

1.4.1 Figure 1 shows the location and layout of the proposed fill bank after expansion. Figure 2 shows the section of the fill bank. The fill bank will occupy a maximum site area of approximately 37 hectares in Tuen Mun Area 38 after the proposed expansion.

1.4.2 The proposed expansion of the fill bank will achieve its maximum capacity to accommodate approximately 5.1 Mm^3 (9.2M tonnes) of public fill after extension with a maximum stockpile height of approximately +40mPD.

1.5 NUMBER AND TYPES OF DESIGNATED PROJECTS TO BE COVERED BY THE PROJECT PROFILE

1.5.1 There is only one designated project covered in this Project Profile.

1.5.2 The proposed fill bank at Tuen Mun Area 38 is a designated project by virtue of C.11 in Section C *Reclamation, Hydraulic and Marine Facilities, Dredging and Dumping* in Schedule 2, Part I of the EIA Ordinance which specifies that a public dumping area of not less than 2 hectare in size is a designated project.

1.6 NAME AND TELEPHONE NUMBER OF CONTACT PERSONS

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2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 HOW WILL THE PROJECT BE PLANNED AND IMPLEMENTED

2.1.1 The proposed expansion and extension of the fill bank at Tuen Mun Area 38 is under planning and design by in-house staff of CEDD. A contractor will be commissioned to establish, operate and decommission the fill bank under the supervision of CEDD. The key activities associated with the establishment (for the purpose of expansion of the fill bank), operation and removal of the development are described below.

Establishment Phase

2.1.2 The site, except the additional area to be included, is currently in operation as a fill bank under the supervision of CEDD. Facilities including those for loading/unloading at the barge handling area, site office, wheel washing and weighbridge facilities already exist and are currently in operation. Given the same nature of the activities and the required facilities and environmental protection measures, it is not anticipated that the establishment phase of the fill bank will require any major civil engineering works of long duration. The key activities during the establishment phase will involve construction of drainage facilities including surface drainage channels, erection of site hoarding to bound the additional stockpiling area, formation of paved haul road, and construction of additional tipping halls / barge handling areas at the berthing area.

Operation and Removal Phases

2.1.3 The daily operation of the fill bank involves the handling of public fill delivered to and exported from the site by trucks and barges. The fill bank opens from 8:00 a.m. to 8:00 p.m. daily except during the Chinese New Year holidays to receive public fill materials from land-based route in order to provide a stable outlet for public fill to serve the construction industry. The opening hours of the fill bank are the same as WENT landfill to encourage the use of the fill bank and thus minimise the disposal of reusable fill material to the landfill to which the main access also go via Lung Mun Road. Public fill intake and export by barges and their transportation between barges and the stockpiling area are allowed 24 hours a day.

2.1.4 Based on a recent review by CEDD on the public fill management strategy for the next few years, the maximum daily incoming public fill truck flow via land-based route to the fill bank at Tuen Mun is estimated to be no more than 1,600 from early 2005 to the end of the proposed extended operational phase in March 2009. With reference to the past 14 months (June 2003 to July 2004) statistics of incoming truck flow, the average incoming truck flow to the fill bank at Tuen Mun Area 38 was about 600-1,000 per day. This indicates that the 1,600 truck flow to the fill bank at Tuen Mun Area 38 adopted for this assessment is reasonable and conservative estimates with reference to the existing fill bank operation.

2.1.5 Apart from the incoming public fill via land-based route, the fill bank at Tuen Mun Area 38 may occasionally receive public fill delivered by barges but the daily bargeload will normally not be more than two. The material so received will generally be transferred to barges directly for export to the Mainland but, in exceptional circumstances, it may also be transported to the stockpiling area or the C&DMRF/crushing facility. In any case, no material will be stockpiled in the barge handling area.

2.1.6 Concurrent with the operation of the fill bank, stockpiled public fill will be removed at the same time. Public fill will be transported offsite mainly by barges to allow direct transportation and placement of the fill material in reclamation or earth-filling activities. Currently, fill materials are transported to the existing East Sha Chau Mud Pit (ESC) by making use of the existing tipping hall facility to the west of the stockpiling area with a daily removal rate of 350 truckload. After the handover of the tipping hall area for Recovery Park Phase I construction

near the end of 2005, the transportation of material to ESC will be handled by the barge handling areas / tipping halls within the fill bank up to the end of the proposed extended operational phase in March 2009.

2.1.7 In addition, the HKSAR Government has planned to export fill materials to the Mainland including materials stockpiled onsite and those received daily via land and marine route. It is estimated that the total quantities of material to be handled at the berthing area of the fill bank at Tuen Mun Area 38, including intake and export, will not be more than 1,850 truckload per day (including 350 truckload per day export to ESC).

2.1.8 A Construction and Demolition Material Sorting Facility with barging facilities for Penny's Bay Reclamation Stage 2 (hereafter referred to as PBR2 Sorting Facility) located to the immediate south-east of the fill bank site is now receiving public fill from the fill bank. It is estimated that a maximum daily truckload of 750 numbers will be transported from the fill bank to this sorting facility from 2005 up to mid 2008.

2.1.9 The existing C&DMRF located to the northwest of the fill bank at Tuen Mun Area 38 will cease operation in mid 2005. The site of the decommissioned C&DMRF will then be occupied as a crushing facility. Upon operation of this new crushing facility, it is estimated that a maximum daily truckload of 120 will be transported from the fill bank to this new crushing facility. At the same time, there will also be a daily truckload of about 60 transported from this new crushing facility to the fill bank.

Key Activities Summary

2.1.10 The key activities during the establishment, operation and removal phases of the fill bank described above are summarised in Table 2-1.

Table 2-1 Key Activities during the Establishment, Operation and Removal Phases of the Proposed Fill Bank at Tuen Mun Area 38

Development Phase	Activities
Establishment	▪ Construction of temporary storm water system (for the additional stockpiling area only), erection of hoarding (for the additional stockpiling area only), formation of haul road, and construction of additional tipping halls / barge handling areas ▪ Implementation of environmental mitigation measures
Operation	▪ Stockpiling of a maximum of 5.1 million cubic metres (Mm^3) (9.2M tonnes) ▪ Reception of public fill delivered by trucks and barges ▪ Implementation of environmental mitigation measures
Removal	▪ Removal of stockpiled public fill mainly by barges for use in reclamation projects and for export to Mainland with some of the material transported offsite by land for use in nearby work sites ▪ Implementation of environmental mitigation measures

2.2 WHAT IS THE PROJECT TIME-TABLE

2.2.1 Figure 3 presents a preliminary project programme indicating change in area during the concurrent operation and removal of the fill bank from 2005 to March 2009. The preliminary programme for the construction and operation of nearby concurrent projects is also shown in the same figure for reference.

2.3 ARE THERE ANY INTERACTIONS WITH BROADER PROGRAMME REQUIREMENTS OR OTHER PROJECTS WHICH SHALL BE CONSIDERED

2.3.1 As indicated in Figure 3 of this project profile, there are a number of related or concurrent short term and longer term projects in Tuen Mun Area 38. These projects include the existing temporary C&DMRF and the future crushing facility situated to the north-west of the site, the temporary PBR2 Sorting Facility, a Temporary Mixed Construction Waste Sorting Facility (TMCWSF) [formerly referred as C&D material sorting facility or C&DMSF in the previous Project Profile (Register No. PP-179/2002)], and other longer term planned developments including the Recovery Park, Permanent Aviation Fuel Facility, etc as illustrated in Figure 4. The exact location and site requirements of the planned / potential land uses are subject to further studies and advice from the relevant Government Bureaux and Departments. These related or concurrent projects in the vicinity of the proposed fill bank are further described below.

Construction and Demolition Material Recycling Facility (C&DMRF)

2.3.2 Abutting the north-western boundary of the fill bank is the existing temporary Construction and Demolition Material Recycling Facility (C&DMRF). The C&DMRF occupies a site area of about 3.2 hectares. The C&DMRF receives oversized concrete and rock pieces and produces aggregates for concrete production or as sub-base material. The facility processes a maximum amount of 120 truckload of fill materials per day. The C&DMRF receives C&D Material delivered by trucks and shares the same main entrance of the fill bank and mains site access road lying along the northern boundary of the site. The temporary C&DMRF is planned to cease operation in mid 2005. The area originally occupied by C&DMRF will then be occupied by a new crushing facility with similar operation mode and processing capacity.

Construction and Demolition Material Sorting Facility for Penny's Bay Reclamation Stage 2 (PBR2 Sorting Facility)

2.3.3 An area of approximately 3.2 hectares located to south-east of the fill bank is now occupied by the temporary PBR2 Sorting Facility. The PBR2 Sorting Facility processes a maximum amount of 750 truckload of unsorted public fill materials per day. The temporary PBR2 Sorting Facility is scheduled to cease operation in mid 2008.

2.3.4 The PBR2 Sorting Facility is currently in operation and receives public fill from and via the fill bank site. Suitable public fill delivered by incoming trucks/ barges to the fill bank is diverted to the PBR2 Sorting Facility directly. When additional supply of public fill is required for PBR2, stockpiled material at the fill bank is also excavated for feeding the PBR2 Sorting Facility. Direct vehicular access from Lung Mun Road to the PBR2 Sorting Facility (along the eastern boundary of the site) is not allowed to minimise the potential cumulative dust impact due to truck movement on the air sensitive land uses within the nearby River Trade Terminal.

Temporary Mixed Construction Waste Sorting Facility (TMCWSF)

2.3.5 An area of approximately 1.5 hectares abutting the eastern boundary of the PBR2 Sorting Facility is allocated for the TMCWSF. This facility is being planned and will receive mixed C&D material for sorting to separate reusable public fill and C&D waste. The sorted public fill will be transported to the fill bank for storage, while the separated C&D waste will be transported to landfill for proper disposal.

2.3.6 The TMCWSF receives C&D material delivered by trucks. A separate entrance at Lung Mun Road and an access road along the eastern boundary of the fill bank will be provided to allow the direct delivery of C&D material to the TMCWSF. The access road provided along the eastern boundary of the fill bank is solely used for access to the TMCWSF only to minimise dust generation from truck movement near the River Trade Terminal.

Recovery Park

2.3.7 A Recovery Park will be established in Tuen Mun Area 38 in the longer term. According to EPD, the park would consist of two phases each occupying an area of approximately 10 hectares. According to EPD's latest programme, construction of the Recovery Park Phase I will commence in early 2006. The existing tipping hall (for delivery of public fill to East Sha Chau) within the site for the Recovery Park Phase I will be removed by end 2005. Although there is no firm programme for construction of the Phase II development, as requested by EPD, portion of the fill bank site to be occupied by the Recovery Park Phase II will be handed over to EPD by end 2008.

Other Concurrent Projects

2.3.8 Further west of Recovery Park Phase I, the Airport Authority has planned to construct a Permanent Aviation Fuel Facility (PAFF), which will occupy a site area of about 6.9 hectares in Tuen Mun Area 38. According to the latest information, construction of PAFF is expected to commence shortly in early 2005. The overall construction programme will take about 3 years and the PAFF is expected to commence its operation in mid to end of 2007.

2.3.9 There is no other available information indicating any interaction of the proposed expansion and extension of the fill bank with other temporary and long term uses in Tuen Mun Area 38.

3. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

3.1 EXISTING AND PLANNING SENSITIVE RECEIVERS AND SENSITIVE PARTS OF THE NATURAL ENVIRONMENT WHICH MIGHT BE AFFECTED BY THE PROPOSED PROJECT

3.1.1 The proposed fill bank is situated on the outskirts of Tuen Mun in an undeveloped newly reclaimed land with some nearby industrial premises. The nearest residential developments are village houses at Lung Kwu Tan at more than 2 km to the west of the site, and Melody Garden is also situated at more than 2 km to the east of the site.

3.1.2 The site is bounded by Lung Mun Road to the north. To the south-east of the site is the existing River Trade Terminal. To the west of the site is the reclaimed land formed under the Tuen Mun Area 38 Reclamation Stage I. Further north-west at more than 400 m from the fill bank site boundary is Shiu Wing Steel Mill. On the opposite side of Lung Mun Road there are two proposed holiday camp sites on the hillside. To the south of the fill bank site is coastal water of North Western Water Control Zone.

3.1.3 According to the latest Tuen Mun Outline Zoning Plan (S/TM/19), the site and its surrounding areas lying to the south of Lung Mun Road are zoned as "Other Specified Uses" (OU) annotated "Special Industries Area". Figure 5 shows an Extract of the latest Outline Zoning Plan.

3.1.4 Longer term uses on Tuen Mun Area 38 that are currently under planning include a recovery park, a permanent aviation fuel facility, etc. As described in the preceding section, the development programme of the recovery park has been taken into account in the planning of the decommissioning programme of the temporary fill bank.

3.2 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT AND EXISTING AND/OR RELEVANT PAST LAND USE(S) ON SITE WHICH MIGHT AFFECT THE AREA IN WHICH THE PROJECT IS PROPOSED

3.2.1 The restored Siu Lang Shui landfill is located to the north of the site on the other side of Lung Mun Road. The area of the northern corner of the site that falls within the 250 m consultation zone of the restored Siu Lang Shui landfill will remain the same after expansion (i.e. 3 hectares) (see Figure 6).

4. POSSIBLE IMPACT ON THE ENVIRONMENT

4.1 OUTLINE ANY PROCESSES INVOLVED, INCLUDING PROCESS FLOW DIAGRAMS, SITE PLANS, STORAGE REQUIREMENTS, AND INFORMATION ON EMISSIONS AND DISCHARGES

4.1.1 The programme and key activities during the establishment, and concurrent operation and removal phases of the fill bank are described in Section 2.1. Figure 1 shows the layout of the fill bank. The activities associated with the establishment, operation and removal of the fill bank are further evaluated below with respect to each of the relevant environmental aspects.

4.2 AIR QUALITY IMPACT

4.2.1 The proposed fill bank is situated in an undeveloped newly reclaimed land at Tuen Mun Area 38 with some nearby industrial premises. To the north of Lung Mun Road are undeveloped areas.

4.2.2 The expansion of the fill bank involves construction of temporary drainage systems, erection of hoarding, formation of haul road, and construction of additional tipping halls / barge handling areas. Substantial construction activities are not anticipated. Other existing facilities such as site office, weighbridge, wheel washing facilities, etc. will be adopted for the operation and removal of the fill bank. It is not expected that the construction activities at the fill bank will generate any significant air quality impact. Any potential dust emission impact will be readily mitigated by watering and other standard dust control measures.

4.2.3 During the concurrent operation and removal of the fill bank, handling, loading, unloading, breaking down of oversized public fill and stockpiling activities at the fill bank may result in much higher levels of dust emissions than the establishment phase. If unmitigated, the activities onsite in the handling of public fill could pose some air quality impacts on the existing and planned industrial uses situated in the vicinity of the fill bank. The existing Air Sensitive Receivers (ASRs) of interest include the River Trade Terminal abutting the eastern boundary of the fill bank, and Shiu Wing Steel Mill situated at about 350m to the west of the expanded fill bank site boundary. The planned ASR includes air sensitive land uses within the Recovery Park Phase I and Permanent Aviation Fuel Facility (PAFF) after their operation. Besides, two holiday camp sites are proposed on the hillside on the opposite side of Lung Mun Road and are currently undertaking feasibility study. The feasibility study is substantially completed at the time of preparation of this Project Profile.

4.2.4 The potential dust impact during the concurrent operation and removal of the fill bank from 2005 to March 2009 has been assessed quantitatively. The major source of potential dust impact is associated with dust generation from truck movement. The approach, methodology, and findings of the assessment are presented in Annex I for reference.

4.2.5 Dust control measures have been recommended based on the requirements stipulated in the *Air Pollution Control (Construction Dust) Regulation* (see Attachment I for details). These measures are standard measures that are proven to be effective in controlling fugitive dust emissions. The dust control measures include the designation of an area of 100m x 100m as shown in Figure 7 in the north-eastern corner of the stockpiling area as a "truckload control zone". Number of trucks travelling to the control zone shall be limited to a maximum of 64 vehicles per hour during the period 0800-2000 and a daily maximum of 704 vehicles per day (64 vehicles per hour x 11 working hours within 0800-2000). The assessment findings and the predicted Total Suspended Particulate (TSP) concentrations at the representative assessment points demonstrated that with the implementation of the proposed dust control measures (see Attachment I for details), the establishment, operation and removal of the fill bank will unlikely pose any unacceptable air quality impact on the nearby ASRs. The air quality modelling results demonstrated that with the implementation of standard dust control measures, it is practicable to control the TSP levels at the nearby ASRs to within acceptable levels meeting the air quality criteria specified in the EIAO-TM.

4.2.6 TSP monitoring is carried out routinely for the fill bank at Tuen Mun Area 38 as part of an Environmental Monitoring and Audit Programme. The air monitoring stations (A1 and A2) are located at the northeast corner near the site entrance and close to the western boundary as shown in Figure 8. The average 1-hour and 24-hour TSP concentrations monitored from July 2003 to June 2004 were 208 $\mu g/m^3$ and 120 $\mu g/m^3$ respectively for A1 and 289 $\mu g/m^3$ and 151 $\mu g/m^3$ respectively for A2, which are well below the 1-hour and 24-hour TSP limit levels. The 90^{th} percentiles of the 1-hour and 24-hour TSP monitoring results were also within the TSP limit levels. These existing monitoring results prove that the potential dust impact would be controlled to acceptable levels through application of standard dust control measures.

4.2.7 It is recommended to continue auditing the effectiveness and adequacy of the dust control measures applied by the contractor in the establishment, operation and removal of the fill bank through an Environmental Monitoring and Audit (EM&A) programme.

4.2.8 The potential off-site air quality impact due to possible increase in traffic flow associated with the fill bank is considered to be insignificant. The increase in daily truck flow to the fill bank in Tuen Mun Area 38 is estimated to be not more than 400 truckload as compared with the existing fill bank operation. This additional flow accounts for less than 2% of the daily design capacity flow of Lung Mun Road of 33,600 vehicles. The change in off-site environmental impact associated with the proposed fill bank operation is envisaged to be insignificant.

4.3 NOISE IMPACT

4.3.1 The establishment activities at the fill bank will involve the use of Powered Mechanical Equipment during the daytime and evening periods. All construction works at the fill bank will be carried out during the non-restricted hours (i.e. 7:00 a.m. to 7:00 p.m. on weekdays other than general holidays).

4.3.2 For the concurrent operation and removal of the fill bank, in addition to the normal fill bank opening hours from 8:00 a.m. and 8:00 p.m., the fill bank will also operate in night time from 8:00 p.m. to 8:00 a.m. to transport fill materials from barge to stockpile and vice verse, which resembles the existing practice.

4.3.3 In the establishment, operation and removal of the fill bank, there would be some other concurrent activities offsite that may generate some noise from construction works or industrial operation. Nevertheless, the nearest existing Noise Sensitive Receivers (NSRs) are village houses in Lung Kwu Tan located at more than 2 km from the site. Melody Garden and Butterfly Estate are also located at more than 2 km from the site. Given the vast distance separation between the existing NSRs and the site, it is not anticipated that the fill bank will pose any noise impact on the surrounding existing NSRs. Notwithstanding this, noise management measures are recommended to be implemented by the contractor as good site practices in the establishment, operation and removal of the fill bank.

4.3.4 The operation of the fill bank will generate some traffic on the nearby road networks. Based on a recent review by CEDD on the public fill management strategy for the next few years, the maximum daily incoming public fill truck flow via land-based route to the fill bank at Tuen Mun is estimated to be no more than 1,600 from early 2005 to the end of the proposed extended operational phase in March 2009. With reference to the past 14 months (June 2003 to July 2004) statistics of incoming truck flow, the average incoming truck flow to the fill bank at Tuen Mun Area 38 was about 600-1,000 per day. This indicates that the 1,600 truck flow to the fill bank at Tuen Mun Area 38 adopted for this assessment is reasonable and conservative estimates with reference to the existing fill bank operation.

4.3.5 The past truckload records indicated that the peak truckload arrival time occurred at about 11:00 a.m. to noon, which accounted for approximately 13% of the total daily truckload. Therefore, together with the TMCWSF and PBR2 Sorting Facility, the fill bank will normally serve approximately 208 public fill delivery trucks (i.e., 1,600 veh/day x 13%) going to Tuen Mun

Area 38 during the peak hour. The hourly average public fill delivery truck volume to the fill bank was calculated to be 145 vehicles (i.e., 1,600 veh/day ÷ 11 hrs).

4.3.6 In addition to the land-based access, a marine access is provided at the fill bank for delivery of public fill by barges to and from the site. This provides a convenient means for access to the public filling facilities for construction and reclamation sites located in the other parts of the Territory as well as in the Mainland and thus minimise the public fill delivery trucks travelling distance and cross-district traffic.

4.3.7 Since the commissioning of Lung Fu Road in March 2002, the traffic noise impact arising from the existing Lung Mun Road on the nearby residential developments have been reduced by diversion of vehicles to use Lung Fu Road. Lung Fu Road provides a direct route to the south western part of Tuen Mun. Lung Fu Road is provided with traffic noise mitigation measures, including proper alignment to maximise setback distance from NSRs (e.g. setback from Melody Garden is more than 300m) and provision of low noise road surfacing and noise barriers in the proximity of the NSRs. Wong Chu Road connected with Lung Fu Road is also provided with noise enclosures and noise barriers to control the traffic noise impact generated from the vehicles using these roads. Figure 9 illustrates the traffic noise mitigation measures incorporated into the design of Lung Fu Road and Wong Chu Road.

4.3.8 The existing operation of the fill bank at Tuen Mun Area 38 demonstrated that traffic noise impact is unlikely to be a concern to existing NSRs.

4.3.9 With the provision of the new Lung Fu Road and the associated traffic noise mitigation measures, it is considered that the operation of Tuen Mun Area 38 as a fill bank would unlikely generate any traffic related environmental impacts attributable to the operation of the fill bank.

4.3.10 Apart from the existing NSRs, a holiday camp development comprising of two sites is proposed on the hillside to the north of the fill bank on the opposite side of Lung Mun Road and are currently undertaking feasibility study. The feasibility study is substantially completed at the time of preparation of this Project Profile. Based on the latest information provided by the project proponent, the holiday camp will commence operation before the decommissioning of the fill bank in March 2009. The planned holiday camp development is therefore considered as a potential future NSR with regards to the Fill Bank at Tuen Mun Area 38. It would be subject to potential noise impact from the concurrent operation and removal of the fill bank as well as the new crushing facility to be situated at the site of the decommissioned C&DMRF.

4.3.11 Despite that there is no programme for the implementation of the holiday camp development, it is expected that these two camp sites will only commence operation only in 2007 or later after the C&DMRF is decommissioned in mid 2005. If the planned holiday camp development comes into operation in 2007 and prior to the decommissioning of the fill bank, administration measure will be implemented by CEDD to reduce the land-based truck flow to the fill bank at Tuen Mun Area 38 by diverting part of the public fill trucks to other outlets, for example, the Kwai Chung Public Filling Barging Point currently planned for commissioning in 2007. Annex II included a fixed noise impact assessment based on the status of the fill bank in 2007 when the planned holiday camp development may come into operation. At-source mitigation measures are proposed in order to attenuate the noise impact. In addition, control measures will be imposed during night time period to restrict the activities at the stockpile (including travelling of vehicles) to the southern portion of the fill bank only. Figure A2 of Annex II indicates the proposed noise mitigation measures. The assessment result showed that the residual environmental impacts at the proposed holiday camp would be insignificant with the proposed mitigation in place.

4.4 WATER QUALITY IMPACT

4.4.1 The site is situated within the North Western Water Control Zone (WCZ). Given the nature of the project, water quality criteria and baseline water quality related to suspended particulate are of relevance.

4.4.2 The water quality in the North Western WCZ is influenced by the massive Pearl River flows and discharges from sewage outfalls. There are three major sewage outfalls in this WCZ, including Northwest New Territories, Pillar Point and Siu Ho Wan sewage outfalls. The Water Quality Objectives (WQOs) applicable to the North Western WCZ are given in Annex II. The WQOs specified that for suspended solids, human activity should neither cause the natural ambient level to be raised by more than 30% nor give rise to accumulation of suspended solids which may adversely affect aquatic communities.

4.4.3 EPD carry out routine water quality monitoring at 6 stations within the North Western WCZ. Among these stations, NM3 at Pillar Point is located nearest to the site. Table 4-1 presents a summary of the water quality monitoring data obtained in 1998 through 2002 at NM3.

Table 4-1 Water Quality Monitoring Data obtained at NM3

Water Quality Parameter	1998	1999	2000	2001	2002
Temperature (°C)	23.9 (18.4 – 27.0)	23.7 (17.4 – 27.3)	23.4 (17.4 – 28.0)	23.3 (16.8 – 28.2)	23.5 (18.0 – 27.8)
Suspended Solids (mg/L)	12.2 (3.5 – 32.3)	7.5 (2.8 – 14.6)	10.3 (1.9 – 20.3)	13.3 (5.1 – 28.0)	10.3 (2.5 – 23.8)
Turbidity (NTU)	9.0 (5.3 – 19.5)	9.9 (3.5 – 14.8)	11.9 (1.8 – 29.8)	17.8 (11.2 – 26.2)	15.5 (6.6 – 26.0)
Salinity (psu)	27.6 (19.3 – 31.6)	29.2 (22.5 – 33.2)	29.5 (26.7 – 32.7)	28.1 (18.2 – 31.7)	29.0 (23.6 – 32.4)
Dissolved Oxygen (mg/L)	5.6 (3.8 – 8.4)	5.9 (3.3 – 8.0)	5.9 (3.5 – 8.1)	5.7 (3.7 – 7.6)	6.2 (3.9 – 7.6)
PH	7.6 (6.5 – 8.2)	8.0 (7.8 – 8.3)	7.9 (7.7 – 8.3)	8.1 (7.8 – 8.4)	8.0 (7.8 – 8.2)
5-day BOD (mg/L)	0.8 (0.3 – 1.5)	0.6 (0.2 – 0.9)	0.6 (0.1 – 1.7)	0.6 (0.1 – 0.9)	0.9 (0.6 – 1.4)
Total Inorganic Nitrogen (mg/L)	0.61 (0.30 – 0.86)	0.35 (0.14 – 0.75)	0.35 (0.16 – 0.59)	0.45 (0.26 – 0.95)	0.41 (0.25 – 0.66)
Unionised Ammonia (mg/L)	0.005 (0.002 – 0.011)	0.003 (<0.001 – 0.007)	0.004 (0.002 – 0.010)	0.007 (<0.001 – 0.020)	0.004 (0.002 – 0.009)
E. coli (cfu/100mL)	2300 (260 – 85000)	680 (88 – 6300)	320 (75 – 1300)	450 (310 – 1800)	560 (100 – 2000)

4.4.4 The nearest Water Sensitive Receivers (WSRs) in the vicinity of the project site are two seawater intake points at Castle Peak Power Station which are located at about 1.4km and 1.5km from the southern boundary of the subject site. Other WSRs such as gazetted beaches are located at further distance away from the site. North Western WCZ also represents an area where the Pearl River dolphin population would inhabit, including Indo-Pacific humpback dolphins (*Sousa chinesis*) which are frequently observed within the WCZ.

4.4.5 Activities during the establishment and concurrent operation and removal phases of the fill bank will be land-based and resemble the existing practice. Before stockpiling takes place in the expansion area, the activities such as installation of drainage channels, erection of site hoarding, formation of haul road, and construction of additional tipping halls / barge handling areas will only involve minor earthmoving or excavation activities. The small quantity of excavated material not required for backfilling will be stockpiled at the fill bank at sufficient buffer distance from the seashore. It is considered that the activities during the establishment of the project will unlikely generate surface runoff containing any significant quantity of suspended solid.

4.4.6 Operation of the fill bank involves handling, transfer and stockpiling of fill material at the fill bank. Potential water quality impact could arise from erosion of stockpiled material leading to

discharge of polluted stormwater, and accidental dropping of material during the transfer of fill material between the site and the barges.

4.4.7 Discharge of surface runoff containing large quantity of suspended solid is a possible concern especially during the rainy season if appropriate environmental control measures are not provided and maintained onsite. Fill material delivered by trucks is dumped to the stockpiling area with a buffer distance of 50m from the seafront. Based on the dumping licence conditions, the fill bank only accepts earth, building debris as well as broken rock and concrete. Mixed materials such as those containing marine mud, pond mud, household refuse, plastic, metal, industrial and chemical waste, animal and vegetable matter and other material considered not suitable by the Filling Supervisor would not be accepted at the fill bank. Over-sized material is broken down into smaller pieces by use of excavators onsite, and small quantity of C&D waste, if identified, is also removed from the public fill before they are stockpiled.

4.4.8 Public fill delivered to the site by barges is uploaded to trucks from the barge at the berthing area during the operational phase. Appropriate design and provision of the public fill handling equipment and other measures is required to minimise the chance of accidental dropping of public fill to the coastal water which may otherwise lead to potential water quality impact, though this would be of localised nature.

4.4.9 During the removal of the fill bank, tipping activities at the tipping hall have the potential of accidental losses of public fill during placement of public fill into the barges. Appropriate design and control of the tipping operation are required to minimise the risk of water pollution from accidental losses of public fill.

4.4.10 The establishment, operation and removal of the fill bank would not involve any marine-based activities except the transport of materials between the fill bank and the barges. It is considered that with application of the best management practices (BMPs) currently adopted in the fill bank to control the land-based pollution sources, the activities during the establishment, operation and removal of the fill bank would not result in any significant water quality impact. The effective implementation of water pollution control measures is monitored with an EM&A programme.

4.4.11 In the presence of the water pollution control measures for the land-based activities at the fill bank, it is not anticipated that there would be any significant water quality impact on the water sensitive receivers. Details of the planned environmental protection measures are presented in Attachment I.

4.5 LANDFILL GAS HAZARD

4.5.1 An area of about 3 hectares in the northern corner of the fill bank site is situated within the 250m consultation zone of the restored Siu Lang Shui landfill after expansion (see Figure 6). The shortest distance between the waste boundary of the landfill and the project site boundary is about 130m.

4.5.2 The restored Siu Lang Shui landfill occupies an area of about 8.3 hectares. It received a total of 2.1 million tonnes of waste. The landfill site ceased to accept further waste since 1983. Restoration works were completed in 2000 and landfill gas and leachate control measures were installed. Contractor has been commissioned to maintain the landfill gas / leachate control measures. Landfill gas migration monitoring results obtained monthly at six monitoring wells installed along Siu Lang Shui Road at the southern boundary of the landfill revealed that except for one measurement result at one monitoring well, the methane concentrations were at or below 1% v/v at all monitoring stations for 14 months from May 2001 to June 2002. Annex III presents the methane monitoring locations and monitoring results.

4.5.3 The portion of site situated within the consultation zone of the restored landfill after expansion is occupied by main access road, wheel washing bay, weighbridges, pubic fill stockpiling area and surface drainage channel. The sensitivity of these uses to landfill gas migration is considered to be low. At the site entrance/ exit, container offices are provided. Appropriate

design of the container offices such as by supporting the containers above a hollow platform have already been implemented to avoid accumulation of landfill gas.

4.5.4 The nature of the project would not require any significant excavation activities. The reclaimed site is topographically flat and the chance of encountering leachate seepage within the site is considered minimal.

4.6 LANDSCAPE AND VISUAL IMPACT

4.6.1 The project site occupies a reclaimed land without existing trees onsite originally. The existing area located to the south of Lung Mun Road is dominated by industrial elements with low landscape quality and sensitivity to change. Potential impact on the existing landscape value of the site is not identified to be a concern.

4.6.2 The nearest high-rise residential buildings at Melody Garden and Butterfly Estate are situated at more than 2km to the east of the site and view angle to the site is limited by foothills present between the site and these developments. Given the vast distance separation, limited view angle and the limited height of the fill bank, it is not anticipated that the establishment, operation and removal of the fill bank after expansion would give rise to any significant visual impact on these Visual Sensitive Receivers (VSRs).

4.6.3 Workers in the nearby factories, G/IC and road users at Lung Mun Road could be affected visually from the increased amount of fill being stored on the site due to the effects on the lower level views from these sites surrounding the fill bank. However, the project is of a temporary nature, and the height of the stockpile would only build up gradually and up to a maximum height of 35m above ground (i.e. 40mPD). The buffer provided between the nearby VSRs and the fill bank is also optimised by the platform-by-platform approach in the build up of the fill bank, with the higher platforms located at further distance away from the VSRs. The magnitude of change arising from the project is considered to be small.

4.6.4 Views from the industrial buildings located to the east of the site are partially blocked by containers and huge machineries. The fill bank is set back from the existing industrial buildings located to the west of the site. A buffer area is provided between the fill bank stockpiling area and Lung Mun Road where low-rise site facilities, site office and the main access road are located. Drivers and passengers of vehicles using Lung Mun Road are in transit and the number of persons is relatively small. Pedestrians using Lung Mun Road are identified to be very limited. Views of the drivers, passengers and pedestrians to the site are also partially blocked by the existing roadside planting and the site hoarding provided along the northern perimeter of the site. The sensitivity to change of these VSRs is considered to be low and the degree of unmitigated visual impact on these VSRs is considered slight.

4.6.5 Apart from the existing VSRs, two holiday camp sites are proposed on the hillside on the opposite side of Lung Mun Road and are currently undertaking feasibility studies. The feasibility study is substantially completed at the time of preparation of this Project Profile. Despite that there is no programme regarding the implementation of the two camp sites, taking into account the time required for detailed design and construction, it is expected these two camp sites will only commence operation on or after 2007. The visual impacts of the fill bank and the at-source noise mitigation measures (including semi-enclosures for major at-grade haul roads as discussed in Section 6 of Annex II) proposed within the fill bank for these planned VSRs, if materialized, will only be temporary for a period of about 2 years. Besides, since the fill bank exists prior to the two holiday camp sites in operation, the magnitude of change arising from the project on the two planned camp sites is considered to be minimal if any.

4.6.6 Additional landscape and visual control measures in the form of applying hydroseeding or coloured geo-textile matting (dark green/brown) to the final slope surfaces has already been implemented on the eastern, northern and western sides of the fill bank. Along the northern perimeter of the site, a buffer tree planting strip is also provided to further soften the landscape.

4.6.7 The structures at the fill bank include the existing wheel washing facility, truck reception house, site office etc. All the structures are low-rise with height of not more than 5m. The design, colour and finish of structures at the fill bank are such that they are visually recessive. Reflectivity is reduced through selection of material or surface treatment. The surface colour selected is of an earthy tone with strong natural qualities (e.g. green / grey / brown). Use of bold colour schemes should be avoided.

4.6.8 CEDD will apply and maintain similar measures after the expansion of the fill bank.

4.6.9 The fill bank is and will open from 8:00 a.m. to 8:00 p.m. to receive incoming fill materials via land-based route. During the period from 8:00 p.m. to 8:00 a.m. onsite activities are limited to the transport of fill materials from barge to stockpile and vice versa. Several spotlights would be used for illumination for works at the fill bank during the evening and night time works. In view of the long distance separation between the fill bank and the high-rise residential buildings, and the limited view angle from the VSRs, the visual impact from evening and night-time glare during the establishment, operation and removal of the fill bank is considered negligible. Notwithstanding these, it is recommended to take into account the following standard measures as good site practices in the planning of any additional spotlights:

- Evaluate the lighting requirements for individual site activities in the evening and night-time periods to avoid the use of excessive lighting while ensuring safe operation;
- Directional down lighting should be used to minimise light spill to surrounding areas; and
- Illumination should be provided at active work areas only. Lighting provided should be localised and shielded from nearby VSRs.

4.6.10 With the incorporation of these standard visual impact mitigation measures as good practices into the design and operation of the fill bank, it is considered that there would not be any significant change to the landscape and visual impact of the project. The project will comply with the landscape and visual requirements specified in the EIAO-TM.

4.7 WASTE MANAGEMENT

4.7.1 Establishment of the fill bank will not require any substantial work activities. Limited quantity of non-inert waste generated will be disposed of properly by delivery to landfill. Excavated material not required for backfilling generated from the construction of the surface drainage channels will be stored within the public fill storage area such that offsite disposal will not be required.

4.7.2 The fill bank is designed for temporary storage of inert public fill and thus not accepts municipal and chemical waste material. This is implemented through the dumping licence conditions which require that materials delivered to public filling facilities are free from household refuse, plastic, animal and vegetable matter, etc. In the handling of the public fill delivered to the site such as laying and compaction of fill material, the filling supervisor requires the C&D waste to be separated and collected as far as possible for disposal to landfill. Such practice will continue to be adopted after the expansion and extension of the project.

4.8 ECOLOGICAL IMPACT

4.8.1 The fill bank including the expansion area is on a newly reclaimed site. The site is bounded by Lung Mun Road. To the east and west of the site are existing and planned industrial land uses. Given the disturbed nature of the site and its immediate surrounding environment, existing ecological resources are lacking. It is therefore considered that the implementation of the fill bank will unlikely pose any ecological impact of concern.

4.9 HAZARD REVIEW

4.9.1 The planned PAFF (EIA Application No. EIA-077/2002) is scheduled to commence operation near the end of Year 2007. Therefore, there will be concurrent operation of the planned PAFF with the fill bank after the proposed extension. The PAFF will include a tank farm located at about 130m to the west of the proposed expanded fill bank. As aviation fuel, which is flammable in nature, will be stored in the tank farm, failure of the storage tank may lead to bund fire/pool fire. The workers within the fill bank will therefore be subject to human risk impact due to the operation of the PAFF.

4.9.2 In the approved EIA report (Register No. AEIAR-062/2002) prepared for the PAFF, a hazard to life assessment was conducted to evaluate the extent of risk impact on the surrounding off-site population due to the operation of the PAFF. According to the individual risk contour shown in Figure 10.4 of the approved EIA report, the maximum level of the individual risk within the fill bank after its expansion would be well within the standard of 1×10^{-5} per year stipulated in Annex 4 of the EIAO-TM.

4.9.3 On the other hand, the risk assessment in the approved EIA report concluded that the mitigated societal risk level would be well within the acceptable risk level based on the assumption that there will be about 684 number of persons within the area of the proposed expanded fill bank site and the C&DMRF site (calculated based on the assumption in Table 10.2 of the approved EIA report that there will be 992 number of offsite population for the entire special industrial area and the expanded fill bank site will occupy about 69% of the entire special industrial area). During the extension period of the fill bank with concurrent operation of the PAFF, CEDD estimated that the number of workers within the proposed expanded fill bank site and the C&DMRF site (i.e. site of the new crushing facility) would not be more than 150. Since this population is lower than the population assumed in the PAFF assessment, the mitigated societal risk during the extension period of the fill bank will therefore be lower than that determined in the approved EIA report and is considered acceptable.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED

5.1 DESCRIBE MEASURES TO MINIMISE ENVIRONMENTAL IMPACTS

5.1.1 As discussed in the previous section, environmental protection measures with respect to fugitive dust emission, noise, water quality, landfill gas, landscape and visual aspects currently adopted will continue after the expansion of the project. These environmental protection measures are described in detail in Attachment I and the environmental implications after the implementation of these measures are evaluated below.

Fugitive Dust Control Measures

5.1.2 Any works that involve the stockpiling of dusty materials are regulated under the *Air Pollution Control (Construction Dust) Regulation* as regulatory work. The dust control measures required under the *Air Pollution Control (Construction Dust) Regulation* should be implemented during the establishment, operation and removal phases of the fill bank.

5.1.3 The fill bank is on a site that is situated away from most air sensitive receivers including all residential developments and active recreational uses. Dust control measures have been recommended based on the requirements in the *Air Pollution Control (Construction Dust) Regulation*. These measures are standard measures that are proven to be effective in controlling fugitive dust emissions. The dust control measures include the designation of an area of 100m x 100m in the north-eastern corner of the stockpiling area as a "truckload control zone". Quantitative assessment with the use of numerical air quality modelling has demonstrated that with the application of these dust control measures, the potential fugitive dust emission impact can be controlled to acceptable levels. Details of the dust control measures planned for mitigating the potential dust impact on the nearby existing and planned industrial uses are presented in Attachment I. The implementation of the dust control measures will be monitored by an EM&A programme.

5.1.4 An Environmental Team (ET) shall be appointed to carry out the recommended EM&A. An Independent Environmental Checker (IEC) shall also be appointed to carry out independent environmental audit of the project after its expansion. The ET shall follow a sampling frequency of at least once in every six days in carrying out 24-hour TSP monitoring. For 1-hour TSP monitoring, a sampling frequency of at least three times per day in every six days should be undertaken during the hours when the highest dust impact is expected to occur (i.e. when the truck flows are relatively high during a day). As the fill bank peak operating hour is expected to occur at approximately 11:00 a.m. to noon, that hour should be covered in the 1-hour TSP monitoring.

5.1.5 The existing monitoring stations A1 and A2 will continue to be adopted to monitor the TSP levels. However, the ET may propose alternative monitoring locations taking into consideration of the latest status, availability and/or accessibility of the various possible monitoring locations. The alternative monitoring locations proposed by the ET shall be approved by the Engineer's Representative and agreed by the Independent Environmental Checker (IEC).

5.1.6 The baseline monitoring of 1-hour and 24-hr TSP concentrations forms the basis for determining the action and limit levels for the impact monitoring as illustrated in Table 5-1. The ET shall compare the impact monitoring results with the action and limit levels. The limit levels for 24-hour TSP and 1-hour TSP monitoring shall be 260 and 500$\mu g/m^3$, respectively. In case of non-compliance with the action or limit level, actions shall be triggered under the EM&A programme to ensure that measures are taken to ameliorate any identified dust impact to within acceptable levels.

Table 5-1 Establishment of Action and Limit Levels for TSP Monitoring

Parameters	Action	Limit
24 Hour TSP Level in μg/m³	For baseline level ≤ 200 μg/m³, Action level = (Baseline level x 1.3 + Limit level) /2; For baseline level > 200 μg/m³, Action level = Limit level;	260 μg/m³
1 Hour TSP Level in μg/m³	For baseline level ≤ 384 μg/m³, Action level = (Baseline level x 1.3 + Limit level) /2; For baseline level > 384 μg/m³, Action level = Limit level;	500μg/m³

Noise Management

5.1.7 It was evaluated that noise generated from the use of Powered Mechanical Equipment during the establishment, operation and removal of the fill bank will unlikely pose any significant noise impact on the surrounding existing NSRs due to the vast distance separation. Notwithstanding this, good site practices and noise management measures are recommended to be implemented by the contractor during the establishment, operation and removal of the fill bank. The recommended noise management control measures are presented in Attachment I.

5.1.8 Apart from the existing NSRs, a holiday camp development comprising of two sites is proposed on the hillside to the north of the fill bank on the opposite side of Lung Mun Road and are currently undertaking feasibility study. The feasibility study is substantially completed at the time of preparation of this Project Profile. Annex II presents the proposed at-source mitigation measures for the fill bank if the holiday camp development comes into operation prior to the decommissioning of the fill bank.

Water Quality Control Measures

5.1.9 Potential water quality impact during the establishment, operation and removal of the fill bank shall be controlled with the following as design principles:

- Prevent or minimise the likelihood of the identified pollutants being in contact with rainfall or runoff; and
- Measures to abate pollutants in the stormwater runoff.

5.1.10 These shall be achieved by implementation of practicable measures to control point and non-point sources of discharges as Best Management Practices (BMPs). Given the similar nature of the activities during the establishment and concurrent operation and removal of the fill bank, the guidelines for handling and disposal of construction site discharges as detailed in EPD ProPECC Note PN1/94 "Construction Site Drainage" shall be followed. The water pollution control measures to be incorporated into the design of the fill bank are described in Attachment I.

5.1.11 All activities associated with the establishment, operation and removal of the fill bank are land-based. With the implementation of the planned water pollution control measures, it is expected that the potential water quality impact can be controlled to within acceptable levels. The implementation of the water quality pollution control measures will be monitored by an EM&A programme.

5.1.12 CEDD is currently implementing a comprehensive water quality monitoring programme for the fill bank at Tuen Mun Area 38. Water quality monitoring shall continue and the ET shall monitor the water quality parameters including turbidity (in NTU), dissolved oxygen (in mg/l) and suspended solids (in mg/l) such that any deterioration in water quality attributable to the operation at the fill bank can be identified and actions are taken timely to rectify the situation.

5.1.13 Figure 10 shows the existing locations of the control stations (FC1 and FC2) and impact monitoring stations (FM1 and FM2) which is proposed to be adopted upon the expansion and extension of the fill bank. If the ET leader would like to propose alternative locations for the

impact and control monitoring stations, he/she shall seek prior approval from Engineer's Representative, IEC and DEP.

5.1.14 Impact monitoring shall be taken under two tidal conditions (mid-flood and mid-ebb) at 3 water depths, namely, 1m below water surface, mid-depth and 1m above seabed, except where the water depth is less than 6m when the mid-depth station may be omitted. Impact monitoring shall be undertaken by the ET at a frequency of three days per week. The interval between two sets of monitoring shall not be less than 36 hours except where there are exceedances of Action and/or Limit levels, in which case the monitoring frequency shall be increased.

5.1.15 The action and limit levels under the EM&A shall be established for the project with account of the baseline water quality, impact and control stations monitoring results and specific limit levels as illustrated in Table 5-2.

Table 5-2 Establishment of Action and Limit Levels for Water Quality Monitoring

Parameters	Action	Limit
DO in mg/l (Surface, Middle & Bottom)	Surface & Middle 5%-ile of baseline data for surface and middle layer Bottom 5%-ile of baseline data for bottom layer	Surface & Middle 4 mg/l except 5 mg/l for Fish Culture Zone (FCZ) or 1%-ile of baseline data for surface and middle layer Bottom 2 mg/l or 1%-ile of baseline data for bottom layer
SS in mg/l (depth-averaged)	95%-ile of baseline data or 120% of upstream control station's SS at the same tide of the same day	99%-ile of baseline, 130% of upstream control station's SS at the same tide of the same day and specific sensitive receiver water quality requirements
Turbidity (Tby) in NTU (depth-averaged)	95%-ile of baseline data or 120% of upstream control station's Tby at the same tide of the same day	99%-ile of baseline or 130% of upstream control station's Tby at the same tide of the same day

5.1.16 Should non-compliance of the action or limit levels occurs, the ET should review and identify the potential source(s) of the impact, devise and implement appropriate mitigation measures in a collaborative manner.

Landfill Gas Control Measures

5.1.17 As a landfill gas control measure, the container offices provided at the site entrance / exit is supported above a hallow platform to avoid accumulation of landfill gas beneath the container office. Other landfill gas control measures, as well as leachate management measures, are described in Attachment I.

5.1.18 With the provision of these landfill gas control measures, the risk from landfill gas and leachate migration will be reduced to acceptable levels.

5.1.19 A landfill gas monitoring programme has been formulated by the Safety Officer / Supervisor of the contractor. The Safety Officer / Supervisor is responsible to carry out periodic monitoring when there are activities such as excavation and trenching at locations within the consultation zone of the restored Siu Lang Shui landfill. The Safety Officer / Supervisor should be present onsite throughout the periods when there are any excavation works undertaken within the consultation zone of the closed Siu Lang Shui Landfill.

5.1.20 The Safety Officer / Supervisor should be provided with an intrinsically safe portable instrument(s), appropriately calibrated and capable of measuring methane, carbon dioxide and oxygen in the specified ranges. The Safety Officer / Supervisor shall initiate appropriate actions

such as posting "no smoking" signs and prohibition of hot works in region with high levels of methane, carbon dioxide or oxygen monitored.

Landscape and Visual Impact

5.1.21 The evaluation presented in Section 4 identified that direct impact on the landscape resources of the site from the project is not a concern. The nearest high-rise residential buildings are located at significant distances away from the site such that the potential visual impacts on these VSRs are considered negligible.

5.1.22 Given the temporary nature of the project and taking into account the factors namely the buffer incorporated into the design of the fill bank, the limited height of the fill bank, the gradual build up of fill bank height, and the relatively short duration of exposure of the nearby VSRs, the unmitigated visual impact on the nearby workers and road users is considered slight. Visual impact control measures in the form of applying hydroseeding or coloured geo-textile matting (dark green/ brown) on the final slope surfaces of the eastern, northern and western sides of the fill bank has currently been adopted and will continue after the expansion of the fill bank (see Figure 11).

5.1.23 To further soften the landscape, a buffer tree planting strip along the northern perimeter of the site (see Figure 11) has currently been adopted and will continue after the expansion of the fill bank. A row of approximately 3m high native evergreen tree species with a tall habit such as the tree *Casuarina equisetifolia* is planted at the early phase of the project. To ensure the proper implementation of these measures, the contractor is required to hire a Government approved landscape sub-contractor to undertake and maintain the hydroseeding and tree planting works. The landscape and visual control measures are included into the list of environmental control measures in Attachment I.

5.1.24 The project site is situated in an undeveloped newly reclaimed land with some nearby industrial premises. The site is situated at significant distance away from residential developments. With the provision of the planned landscape and visual impact control measures, the potential impact would be controlled to within acceptable levels.

5.2 COMMENT ON THE POSSIBLE SEVERITY, DISTRIBUTION AND DURATION OF ENVIRONMENTAL EFFECTS

Environmental Problem Avoided

5.2.1 The fill bank after expansion will provide an outlet for temporary storage of a total quantity of up to 5.1 million cubic metres (9.2M tonnes) public fill for subsequent reuse in reclamation projects. Without the proposed expansion and extension of the fill bank, there would be a significant shortfall in public fill receiving capacity in the territory and the likely consequence is that a large quantity of reusable inert public fill may inevitably need to be disposed of to the landfills. The landfill spaces are expensive and designed for disposal of municipal waste and have been spent far more rapidly than originally planned for. The disposal of reusable public fill to the landfills should therefore be avoided as far as possible.

5.2.2 The beneficial reuse of public fill in reclamation projects (and earth filling projects) reduces the reliance of these projects on general fill. Thus, the proposed fill bank at Tuen Mun Area 38 would help to conserve the natural resources through minimising earth borrowing activities and marine sand extraction. Provision of stable outlets on public fill for the construction industry is also important as a measure to discourage generation of mixed C&D material at construction sites as well as illegal dumping, and encourage onsite sorting of C&D material for their subsequent reuse at public filling areas.

Environmental Protection Measures Provided

5.2.3 The fill bank is of temporary nature and the removal programme of the fill bank has considered the programme of the longer term uses planned in Tuen Mun Area 38. The fill bank site

selected is located away from all residential areas with the nearest residential developments situated at more than 2 km from the site. The project may affect a localised area and adequate environmental protection measures have been considered and incorporated into the design of and work activities at the fill bank to reduce the identified potential environmental impacts to acceptable levels. The implementation of the environmental mitigation measures shall be checked by an Environmental Team and audited by an Independent Environmental Checker (IEC).

5.3 HISTORY OF SIMILAR PROJECTS

5.3.1 CEDD has operated the existing fill bank at Tuen Mun Area 38 since June 2003 and has developed a fill bank of similar nature in Tseung Kwan O Area 137 which has commenced operation in October 2002.

5.4 USE OF PREVIOUSLY APPROVED EIA REPORTS

5.4.1 Reference has been made to the Environmental Impact Assessment carried out under Agreement No. CE 57/2001 *Environmental and Traffic Impact Assessment Study for Fill Bank at Tseung Kwan O Area 137*. Details of this approved EIA report are listed below:

Title of the approved EIA report

5.4.2 Environmental and Traffic Impact Assessment Study for Fill Bank at Tseung Kwan O Area 137 – Environmental Impact Assessment Report.

Date of Approval

5.4.3 The EIA Report was approved on 27 June 2002 (DEP's letter of approval dated 27 June 2002 of reference (40) in Ax (5) to EP 2/N8/C/23 II refers).

Environmental aspects addressed in the approved EIA Report

5.4.4 The key environmental aspects addressed in the approved EIA report include air quality, noise, water quality, landfill gas hazard, as well as landscape and visual.

Key findings of the approved EIA Report

5.4.5 The approved EIA report identified that the environmental impacts were identified to be either within acceptable levels, or where mitigation measures are necessary, the environmental mitigation measures incorporated into the design of and work activities at the fill bank will mitigate the environmental impacts to within acceptable levels. The approved EIA report carried out for the fill bank at Tseung Kwan O (TKO) Area 137, which is also located in a mixed undeveloped / industrial environment as for the proposed fill bank at Tuen Mun Area 38. This demonstrated that with the provision of appropriate environmental mitigation measures in the establishment, operation and removal of the fill bank, the implementation of the project would unlikely pose any unacceptable environmental impact.

Measures recommended in the approved EIA report and their Relevance of such findings to this Project

5.4.6 **Air Quality Impact** – the EIA identified fugitive dust emission to be the key concern and dust mitigation measures were recommended following the requirements stipulated in the *Air Pollution Control (Construction Dust) Regulation*. Similar dust control measures have been considered and incorporated into the design of the proposed fill bank at Tuen Mun Area 38.

5.4.7 **Noise** – the EIA recommended the provision of a marine-based transportation route for public fill intake at TKO Area 137 during the operational phase and export of public fill during the removal phase to minimise the potential truckload noise impact. Similar barging facilities will also be provided at Tuen Mun Area 38 during the operation and removal phases of the fill bank.

5.4.8 **Water Quality** – the EIA recommended the provision of control measures as best management practices to abate the potential water quality impact from non-point sources discharge. Similar water quality control measures have been considered and incorporated into the design of the proposed fill bank at Tuen Mun Area 38.

5.4.9 **Landfill Gas Hazard** – part of the fill bank at Tseung Kwan O Area 137 is lying within the 250m consultation zone of the South East New Territories (SENT) landfill. The EIA report recommended that no underground drainage and sewerage system shall be constructed within the consultation zone, and container offices provided within the consultation zone shall be constructed on a raised hollow platform. Similar landfill gas protection measures have been derived for the proposed fill bank at Tuen Mun Area 38.

5.4.10 **Landscape and Visual** – the EIA report recommended appropriate fill bank design and slope treatment in form of hydroseeding or use of coloured geo-textile matting as well as chromatic treatment of the onsite C&D Material Sorting Facility. The fill bank design allows the fill bank to mimic the ridgeline of the Country Park and slopes down towards the coastline as occurs naturally to minimise the visual impact at the VSRs. Similar landscape / visual control measures have been implemented for the proposed fill bank at Tuen Mun Area 38.

5.4.11 The EIA report carried out for the fill bank at TKO Area 137 concluded that with the implementation of these measures, the establishment, operation and removal of the fill bank will unlikely pose any unacceptable environmental impact. An Environmental Permit (No. EP-134/2002) was issued by the Authority for the construction, operation and removal of the fill bank.

6. PROJECT SUMMARY

6.1.1 This section presents a summary table presenting the key background and project design information, degree of impacts from the project and evaluation of acceptability, and where environmental control / mitigation measures are recommended, the evaluation of acceptability of the residual environmental impact with reference to the relevant guidelines and criteria specified in the EIAO-TM.

6.1.2 As presented in the above sections and the summary in Table 6-1 below, all relevant environmental factors associated with the establishment, operation and removal of the proposed fill bank have been evaluated in this project profile. The review indicated that the environmental impacts associated with the expansion and extension of the project are unlikely to be adverse. Effective and practicable environmental control / mitigation measures have been recommended to mitigate the potential environmental impact to acceptable levels to meet the guidelines and criteria of the EIAO-TM.

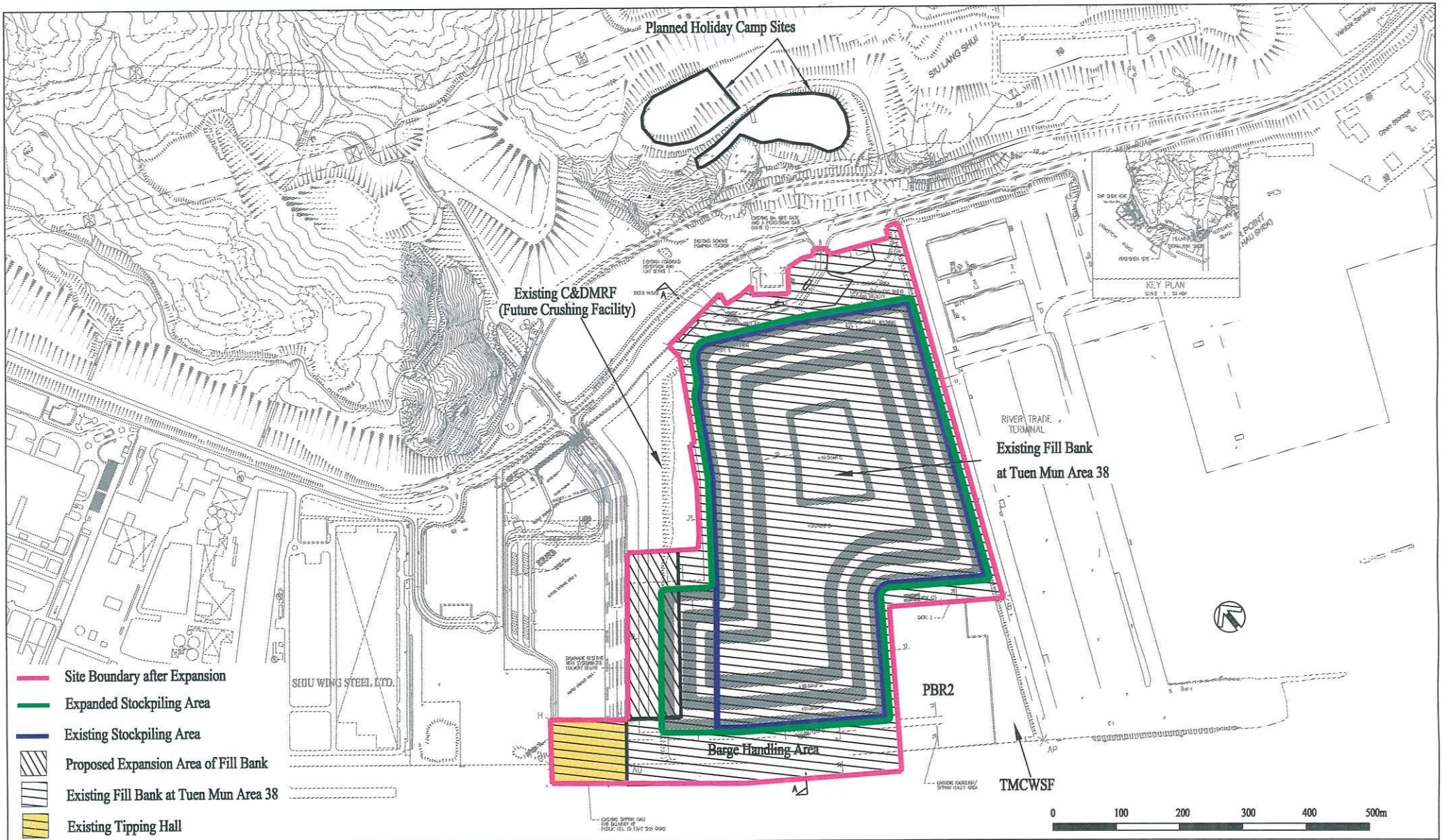
Table 6-1 Fill Bank Project Summary Table

Background Information	• The local construction industry generates large quantity of construction and demolition (C&D) material each year; major portion of C&D material is inert material and have been used beneficially in reclamation and earth filling projects. • Use of public fill in reclamation and earth filling projects reduces demand on general fill and help to conserve natural resources. • Originally, it was estimated that there would be a significant shortfall in public fill receiving capacity from 2002 to 2005. • With the cancellation and deferral of some planned reclamation projects, however, the demand of public fill has greatly reduced. Reclamation projects like the Wanchai Development Phase II and the Southeast Kowloon Development are currently under review. The situation with shortfall in public fill capacity is anticipated to continue. Therefore, it is necessary to increase the capacity or/and extend operation of the existing fill banks at Tuen Mun Area 38 and Tseung Kwan O Area 137. With the operational period extended, the existing fill bank at Tuen Mun Area 38 will serve as a base for export to Mainland and to maintain a stable outlet for the construction industry for disposal of public fill in the western part of the Territory. • Without the proposed fill bank, large quantity of reusable and inert public fill may inevitably need to be disposed of to landfills, including WENT.
Project Design	• Establishment works for the expansion of the fill bank at Tuen Mun Area 38 are required for intake of public fill to the expanded stockpiling area from early 2005. There will be concurrent operation and removal of the project till March 2009 when the fill bank will be fully decommissioned. • The proposed fill bank after expansion will accommodate approximately 5.1 million cubic metres (9.2M tonnes) of public fill. The fill bank will be filled up to a maximum height of 35m above ground (i.e. approximately +40mPD). • Key activities during the establishment phase will involve construction of drainage facilities including surface drainage channels, erection of site hoarding, formation of haul road, and construction of additional tipping halls / barge handling areas. • The fill bank will be in operation to receive materials transported via land-based route from 8:00 a.m. to 8:00 p.m. daily except during the Chinese New Year holidays. Public fill intake and export by barges and their transportation

	between barges and the stockpiling area are allowed 24 hours a day. Removal of the fill bank will rely mainly on a marine route via delivery of fill material to the Penny's Bay Reclamation Stage 2, other reclamation and earth-filling sites, and export to Mainland.
Surrounding Environment	• The fill bank site is situated in an undeveloped, newly reclaimed land with some nearby industrial premises. The nearest residential developments are situated at more than 2 km from the site. On the opposite side of Lung Mun Road is the restored Siu Lang Shui landfill. An area of 3 hectares at the northern tip of the site is situated within the 250m consultation zone of the restored landfill.
Degree of Environmental Impact and Acceptability of Mitigated Impact	**Air Quality** • The fill bank at Tuen Mun Area 38 is currently in operation. TSP monitoring is carried out routinely on every 6-calendar days as part of an Environmental Monitoring and Audit Programme. The average 1-hour and 24-hour TSP concentrations monitored from July 2003 to June 2004 were 208 $\mu g/m^3$ and 120 $\mu g/m^3$ respectively for A1 and 289 $\mu g/m^3$ and 151 $\mu g/m^3$ respectively for A2 respectively, which are well below the 1-hour and 24-hour TSP criteria. These existing monitoring results prove that the potential dust impact would be controlled to acceptable levels through application of standard dust control measures. • Dust control measures have been recommended for implementation during the establishment, operation and removal of the fill bank (see Attachment I for details). These measures are based on those described in the *Air Pollution Control (Construction Dust) Regulation* which have been demonstrated to be effective in controlling fugitive dust emissions. • The air quality modelling of the worst-case scenarios demonstrated quantitatively that with the implementation of the recommended dust control measures, the mitigated highest 1-hour TSP and 24-hour average TSP concentrations at the ASRs would be within the acceptable levels specified in the EIAO-TM. • Implementation of the dust control measures implemented by the contractor will be checked through the recommended Environmental Monitoring and Audit Programme.
	Noise Impact • Construction works will be carried out during the non-restricted hours. The fill bank would not accept fill materials via land-based route from 8:00 p.m. to 8:00 a.m. the next day. • Given the vast distance separation between the existing NSRs and the proposed fill bank, use of Powered Mechanical Equipment during the establishment, operation and removal of the fill bank will unlikely pose any significant noise impact exceeding the noise criteria specified in the EIAO-TM. Notwithstanding this, noise management measures have been recommended as good site practices (see Attachment I for details). • A marine-based access is provided at the fill bank to allow the delivery of public fill by barges and thus minimise cross-district truck traffic. • It is estimated that the maximum truck volume to the fill bank in Tuen Mun Area 38 would not be more than 1,600 trips per day, or 208 veh/hr (1-way) during the peak hour after expansion and extension of the fill bank. A significant portion of existing traffic has been diverted to use the new Lung Fu Road from Lung Mun Road. Lung Fu Road is provided with traffic noise mitigation measures (setback, low noise surfacing and noise barriers). Wong Chu Road connected with Lung Fu Road is also provided with noise enclosures and barriers. With the provision of the new Lung Fu Road and the associated traffic noise mitigation measures, operation of the fill bank would unlikely generate any unacceptable traffic related environmental impacts.

	• With the provision of the recommended at-source noise mitigation measures prior to and during the operation of the planned holiday camp development (see Attachment I for details), the operation of the fill bank would unlikely generate any unacceptable fixed noise impact.
	Water Quality Impact • Activities during the establishment, operation and removal of the fill bank will be land-based. Establishment works will only involve minor earthmoving / excavation activities. Potential water quality impact would be associated with erosion of stockpiled material and accidental dropping of material during the transfer of fill material between the site and the barges, if unmitigated. • Sufficient water pollution control measures have been recommended, including the provision of surface channels to intercept polluted surface runoff for treatment within sand / de-silting traps before discharge, buffer zone between the stockpiling area and the seafront, protection of temporary and final slope surfaces, and use of specified transfer methods in delivery of material between the site and the barges, etc. (see Attachment I for details). • The recommended water pollution control measures have been used in other projects and their effectiveness have been demonstrated in practice. The implementation of the planned water pollution control measures will control the potential water quality impact to within acceptable levels. • Implementation of the water pollution control measures will be checked through an Environmental Monitoring and Audit Programme.
	Landfill Gas Hazard • Landfill gas monitoring data at source revealed that methane concentrations were mostly at or below 1% v/v. Facilities planned within a 3 hectare area situated within the 250m consultation zone of the restored Siu Lang Shui landfill include the existing access road, wheel washing bay, weighbridges, public fill stockpiling area and surface drainage channel. The sensitivity of these uses to landfill gas migration is evaluated to be low. • Main site office of the fill bank is outside the region lying within the 250m consultation zone of the restored Siu Lang Shui landfill. No underground drainage and sewerage system including underground pipelines and chambers will be constructed within the region lying within the consultation zone. Access to the fill bank by the general public will be restricted. Container office(s) at the site entrance / exit situated within the consultation zone is constructed on a raised hollow platform to avoid the trapping of landfill gas. Other landfill gas control measures, as well as leachate management measures, are described in Attachment I. • With the provision of these landfill gas control measures, the risk from landfill gas and leachate migration will be controlled to within acceptable levels.
	Landscape and Visual Impact • The project site is a newly reclaimed land without existing trees. Potential impact on existing landscape value of the site is not identified as a concern. • Nearest high-rise residential buildings at Melody Garden and Butterfly Estate are situated at more than 2km from the site, and with limited angle of view to the fill bank. Workers in the nearby factories, G/IC and road users at Lung Mun Road could be affected visually with respect to the lower level views from these sites. However, given the temporary nature of the project, limited height of the fill bank, short duration of exposure of these VSRs to fill bank and that the height of the fill bank will only be developed gradually platform by platform, the potential visual impact on these VSRs is not considered to

	be significant. • Notwithstanding this, visual control measures, including the application of hydroseeding or coloured geo-textile matting (dark green / brown) on the slope surfaces of the fill bank will minimise any potential visual impact to acceptable range. • To further soften the landscape, a buffer tree planting strip is also provided along the northern perimeter of the site (see Figure 11). A row of approximately 3m high native evergreen tree species with a tall habit such as the tree *Casuarina equisetifolia* has been planted at the early phase of the project. The contractor is required to hire a Government approved landscape sub-contractor to undertake and maintain the hydroseeding and tree planting works. • The design, colour and finish of structures at the fill bank should be visually recessive. Reflectivity should be reduced and bold colour scheme should be avoided.
	Waste Management • The fill bank will not accept waste material. This is implemented through the existing dumping licence conditions which require that materials delivered to public filling facilities are free from household refuse, plastic, animal and vegetable matter, etc. • In the handling of the public fill delivered to the site such as laying and compaction of fill material, the filling supervisor will require the C&D waste identified to be separated and collected for disposal to landfill.
	Ecological Impact • The fill bank occupies a newly reclaimed site and surrounded by industrial land uses to the east and west of the site. Given the disturbed nature of the site and its immediate surrounding environment, existing ecological resources are lacking. Implementation of the fill bank will unlikely pose any ecological impact of concern.
	Hazard Review • With reference to the hazard assessment included in the approved EIA report (Register No. AEIAR-062/2002) prepared for the PAFF, the maximum level of the individual risk within the fill bank after its expansion would be well within the standard of 1×10^{-5} per year stipulated in Annex 4 of the EIAO-TM. • During the extension period of the fill bank with concurrent operation of the PAFF, CEDD estimated that the number of workers within the proposed expanded fill bank site and the C&DMRF site (i.e. the site of the new crushing facility) would not be more than 150 and is lower than the population assumed in the approved EIA Report for PAFF. The mitigated societal risk during the extension period of the fill bank will therefore be lower than that determined in the approved EIA report for PAFF and is considered acceptable.



CH2M-IDC Hong Kong Limited

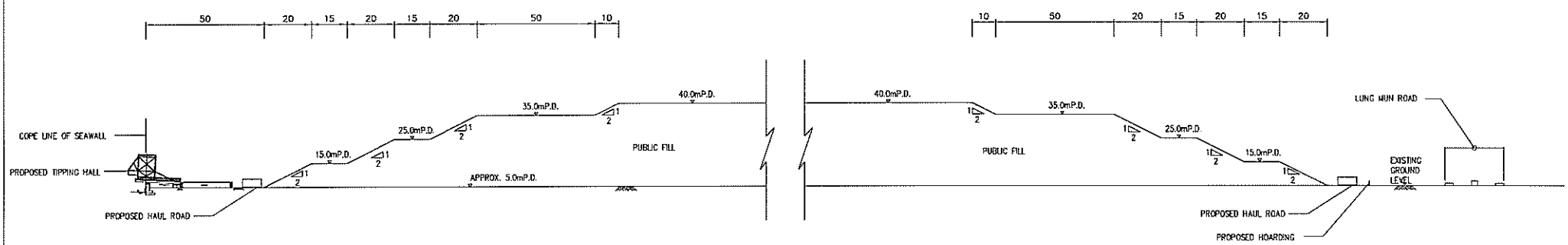
PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38

土木工程拓展署
Civil Engineering and Development Department

Key Plan showing Site Location and Layout Plan showing the Preliminary Design of the Fill Bank

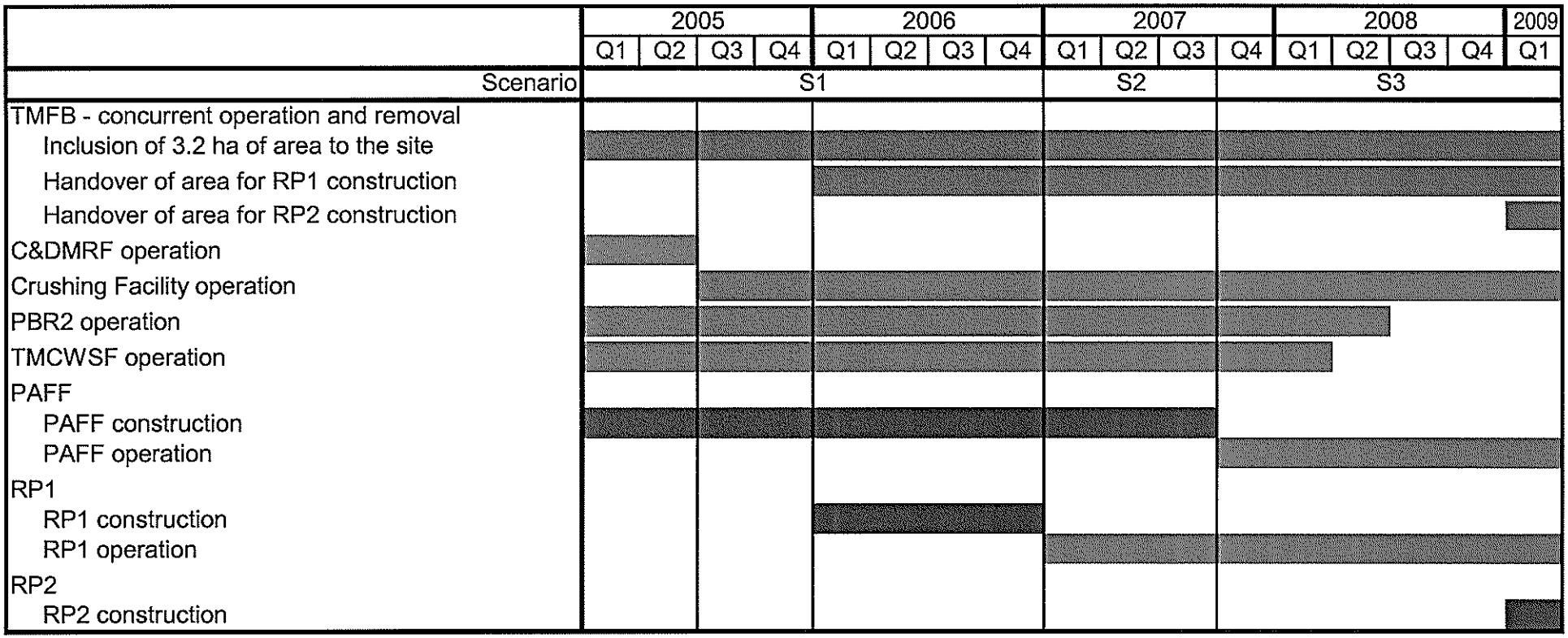
SCALE	NTS	DATE	DEC 2004
DESIGNED	CC	DRAWN	BH

FIGURE 1 REV 3



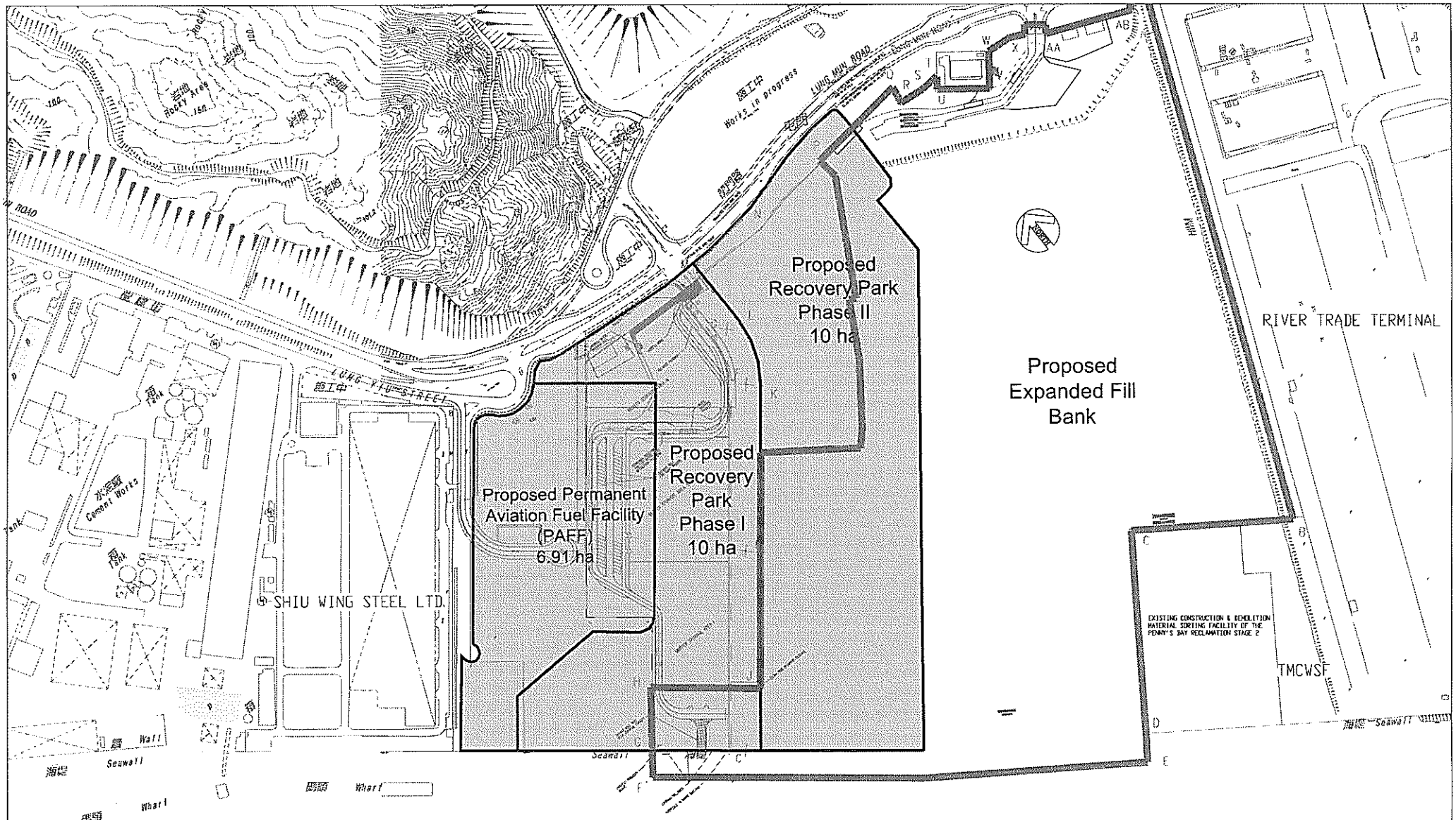
SECTION A–A

CH2M-IDC Hong Kong Limited	PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38	土木工程拓展署 Civil Engineering and Development Department
	Sectional View of the Proposed Fill Bank	SCALE: NTS; DATE: NOV 2004 DESIGNED: CC; DRAWN: WAN FIGURE 2; REV 1

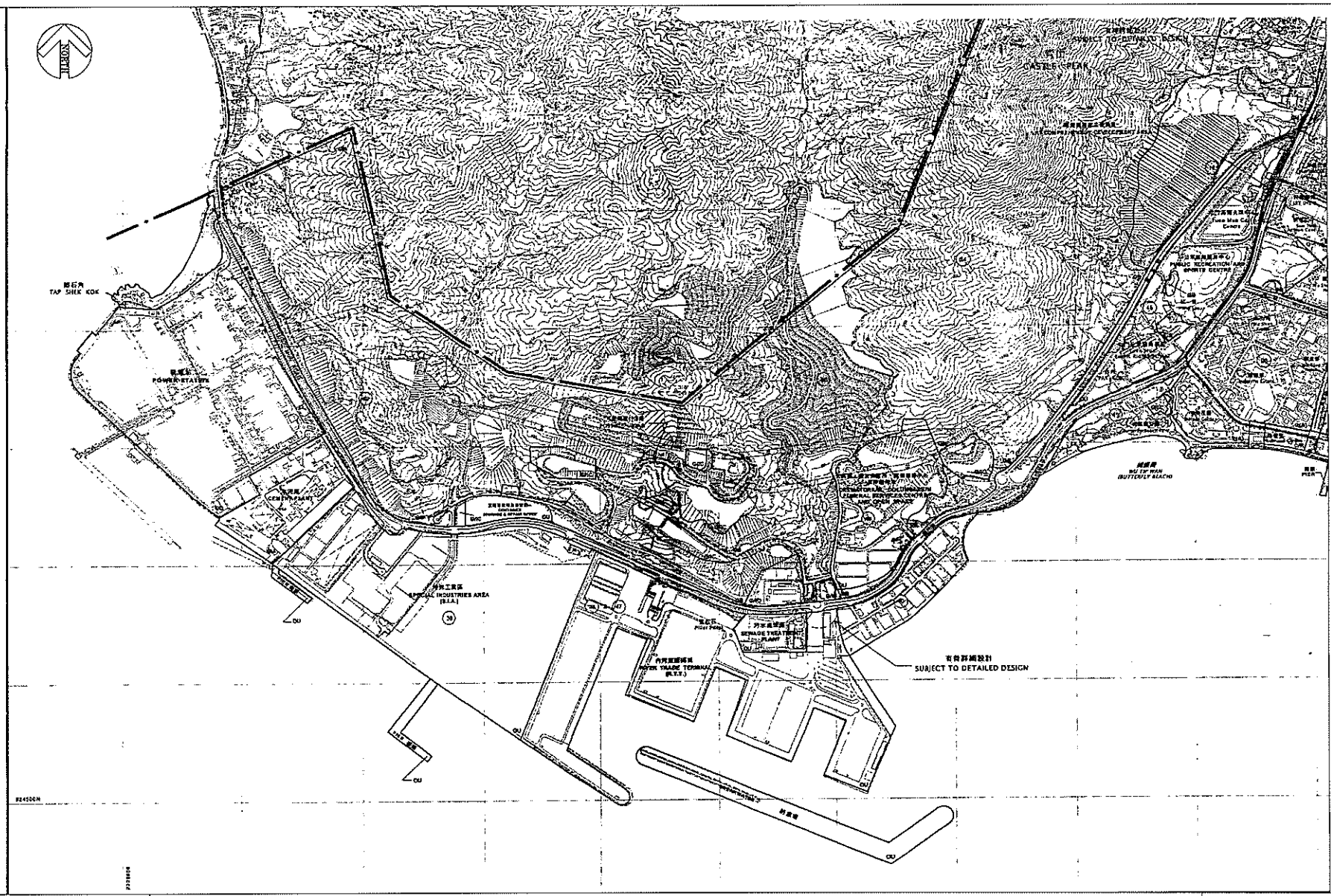


TMFB - Fill Bank at Tuen Mun Area 38
C&DMRF - Construction and Demolition Material Recycling Facility
PBR2 - Public Fill Sorting Facility with barging facilities for Penny · Bay Reclamation Stage 2
TMCWSF - Temporary Mixed Construction Waste Sorting Facility
PAFF - Permanent Aviation Fuel Facility
RP1 - Recovery Park Phase I
RP2 - Recovery Park Phase II

CH2M-IDC Hong Kong Limited	PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38 - INVESTIGATION	土木工程拓展署 Civil Engineering and Development Department
	Preliminary Development Programme of the Fill Bank	SCALE NA · DATE NOV 2004 · DESIGNED CC · DRAWN WAN · **FIGURE 3** · REV 0



CH2M-IDC Hong Kong Limited	PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38	土木工程拓展署 Civil Engineering and Development Department
	Existing and Planned Longer Term Land Uses in Tuen Mun Area 38	SCALE NTS DATE NOV 2004 DESIGNED CC DRAWN WAN FIGURE 4 REV 0



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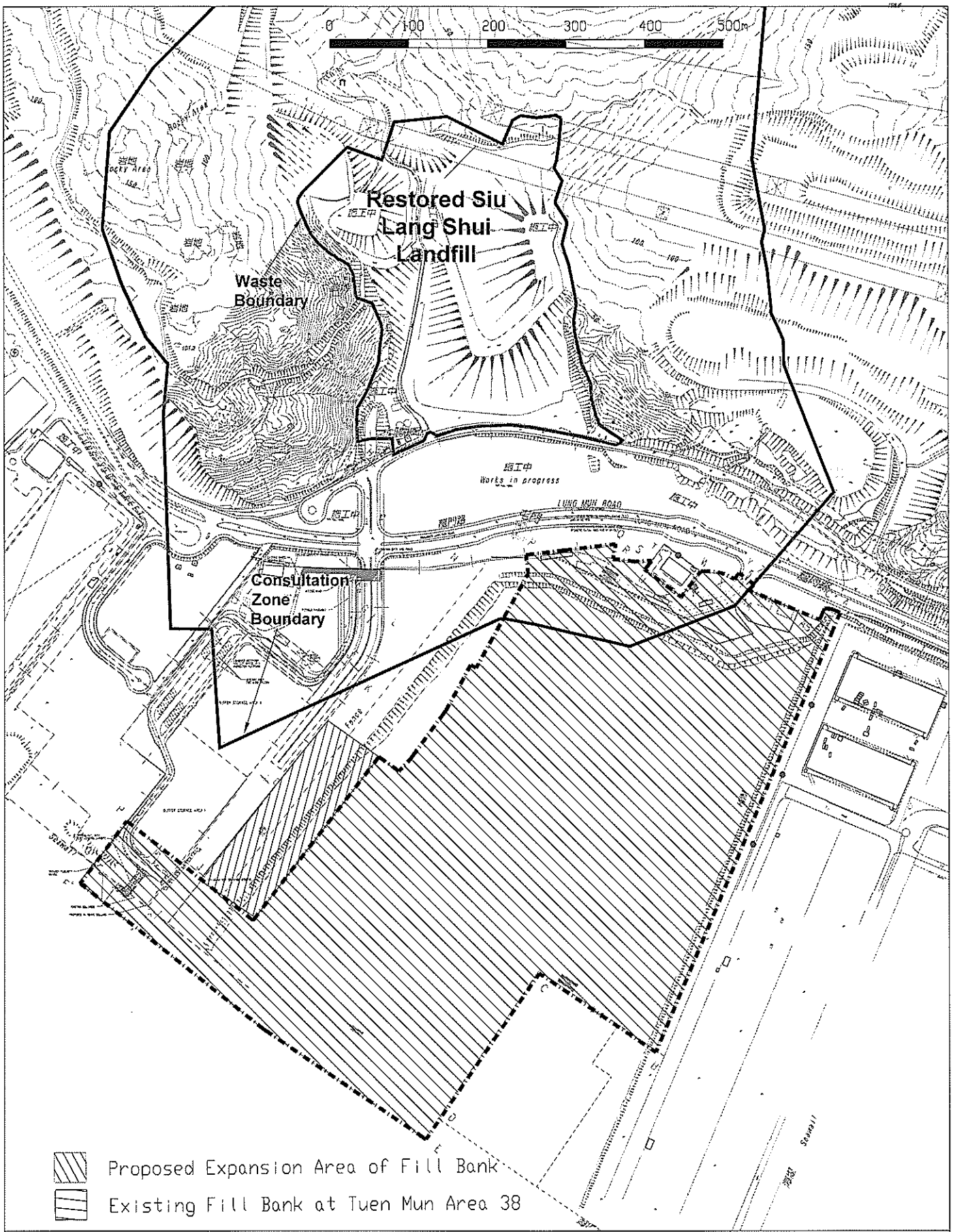
PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38

Extracts of Outline Zoning Plan (S/TM/19)

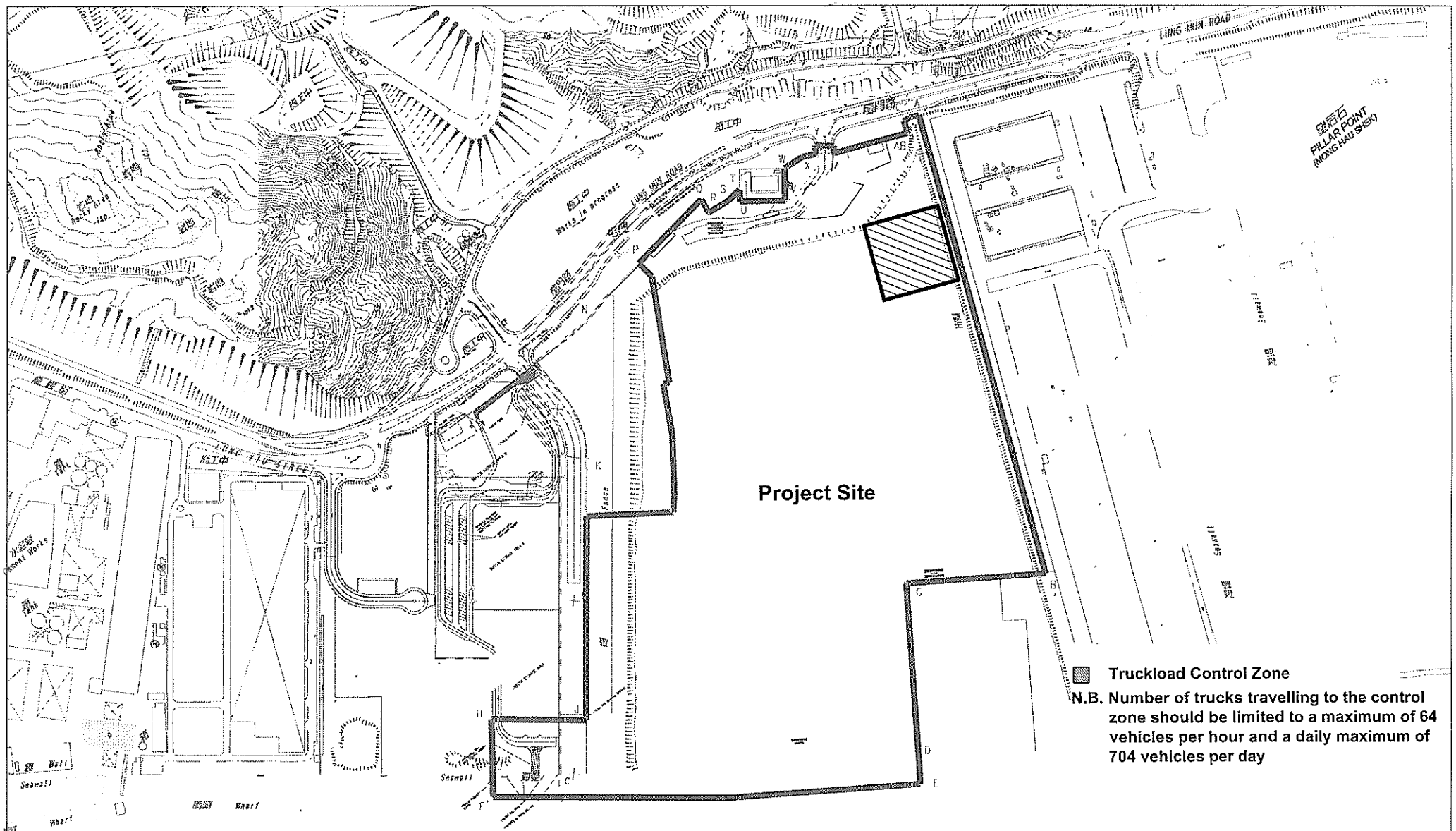
土木工程拓展署
Civil Engineering and Development Department

SCALE	NTS	DATE	NOV 2004
DESIGNED	CC	DRAWN	WAN

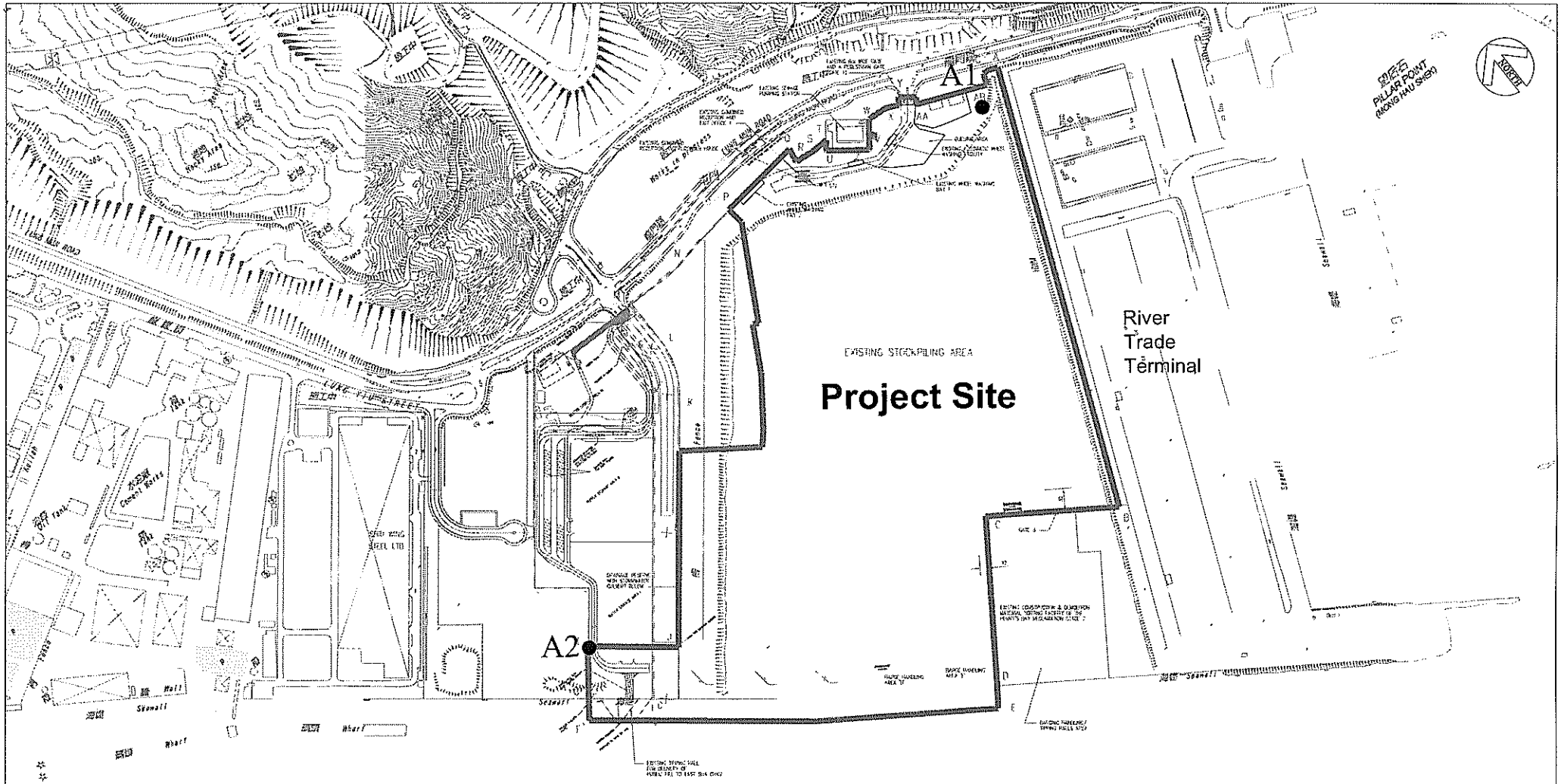
FIGURE 5 REV 0



CH2M-IDC Hong Kong Limited	PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38	土木工程拓展署 Civil Engineering and Development Department
	Consultation Zone of the Restored Siu Lang Shui Landfill	SCALE NTS DATE NOV 2004 DESIGNED CC DRAWN WAN FIGURE 6 REV 0

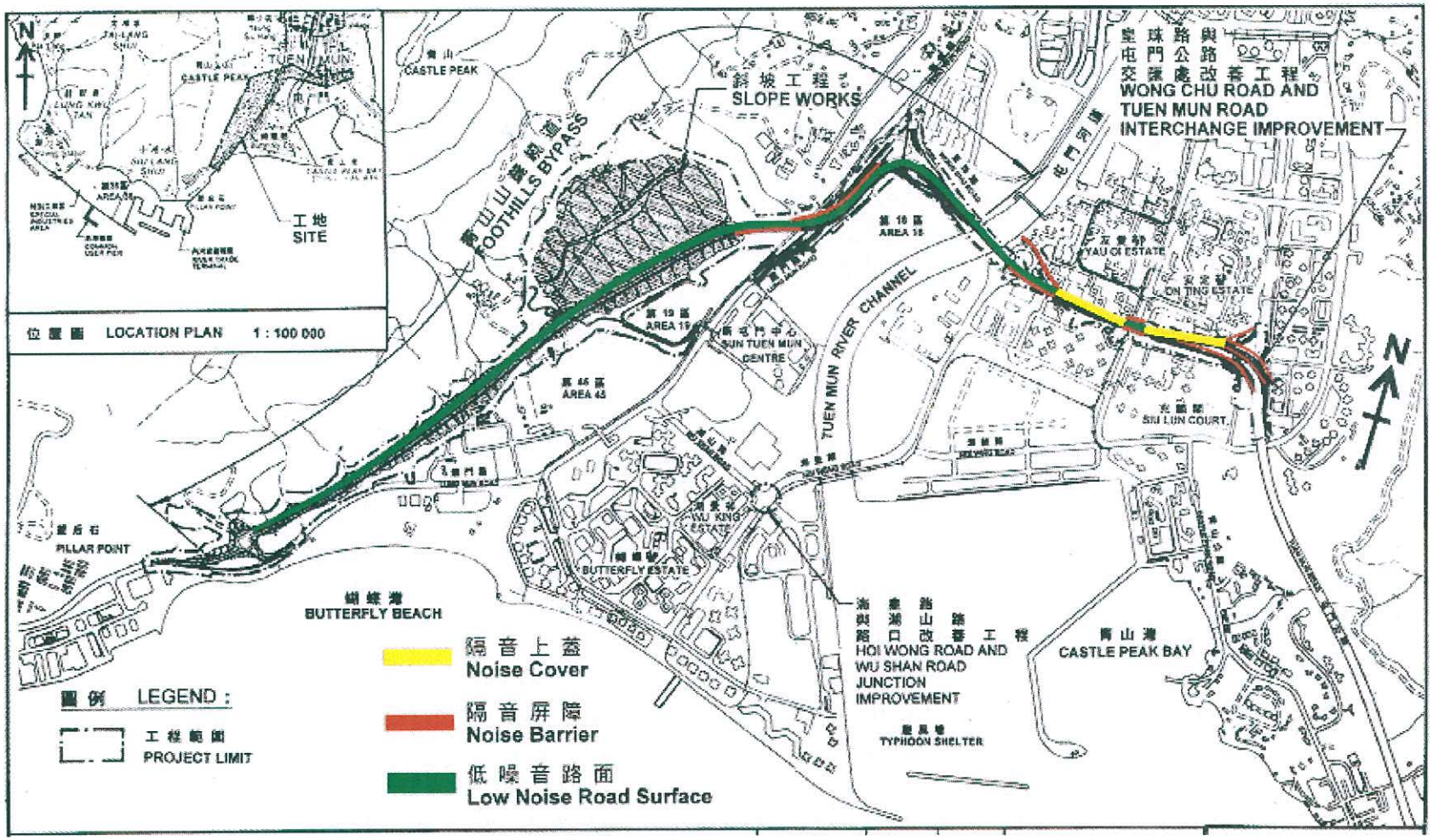


CH2M-IDC Hong Kong Limited	PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38	土木工程拓展署 Civil Engineering and Development Department
	Truckload Control Zone Recommended as a Dust Control Measure	SCALE: NTS; DATE: NOV 2004 DESIGNED: CC; DRAWN: WAN FIGURE 7; REV 0



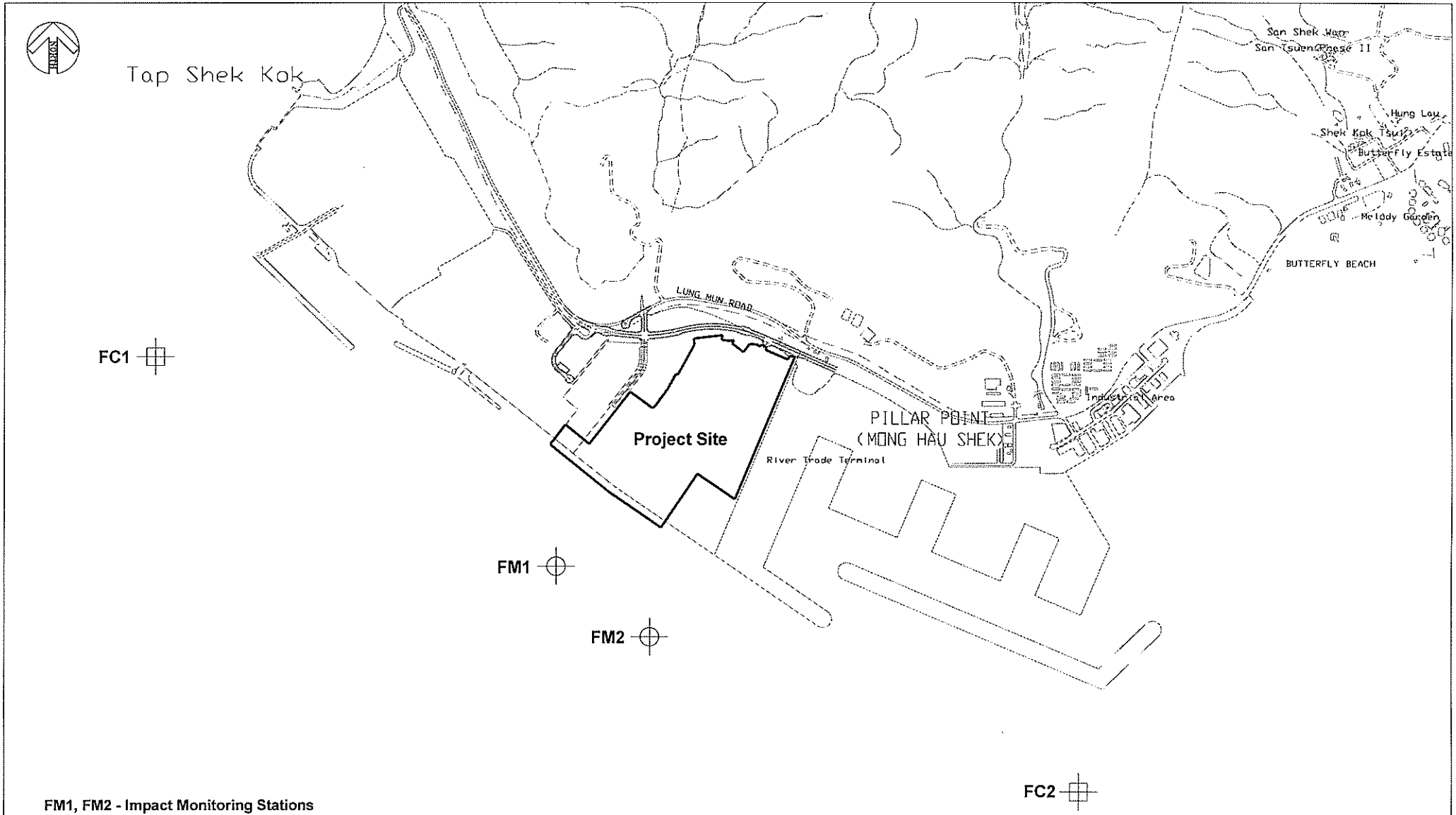
A1, A2 - Existing TSP Monitoring Station

CH2M-IDC Hong Kong Limited	PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38	土木工程拓展署 Civil Engineering and Development Department
	Location of the Existing TSP Monitoring Stations for the Fill Bank at Tuen Mun Area 38	SCALE NTS DATE NOV 2004 DESIGNED CC DRAWN WAN FIGURE 8 REV 1



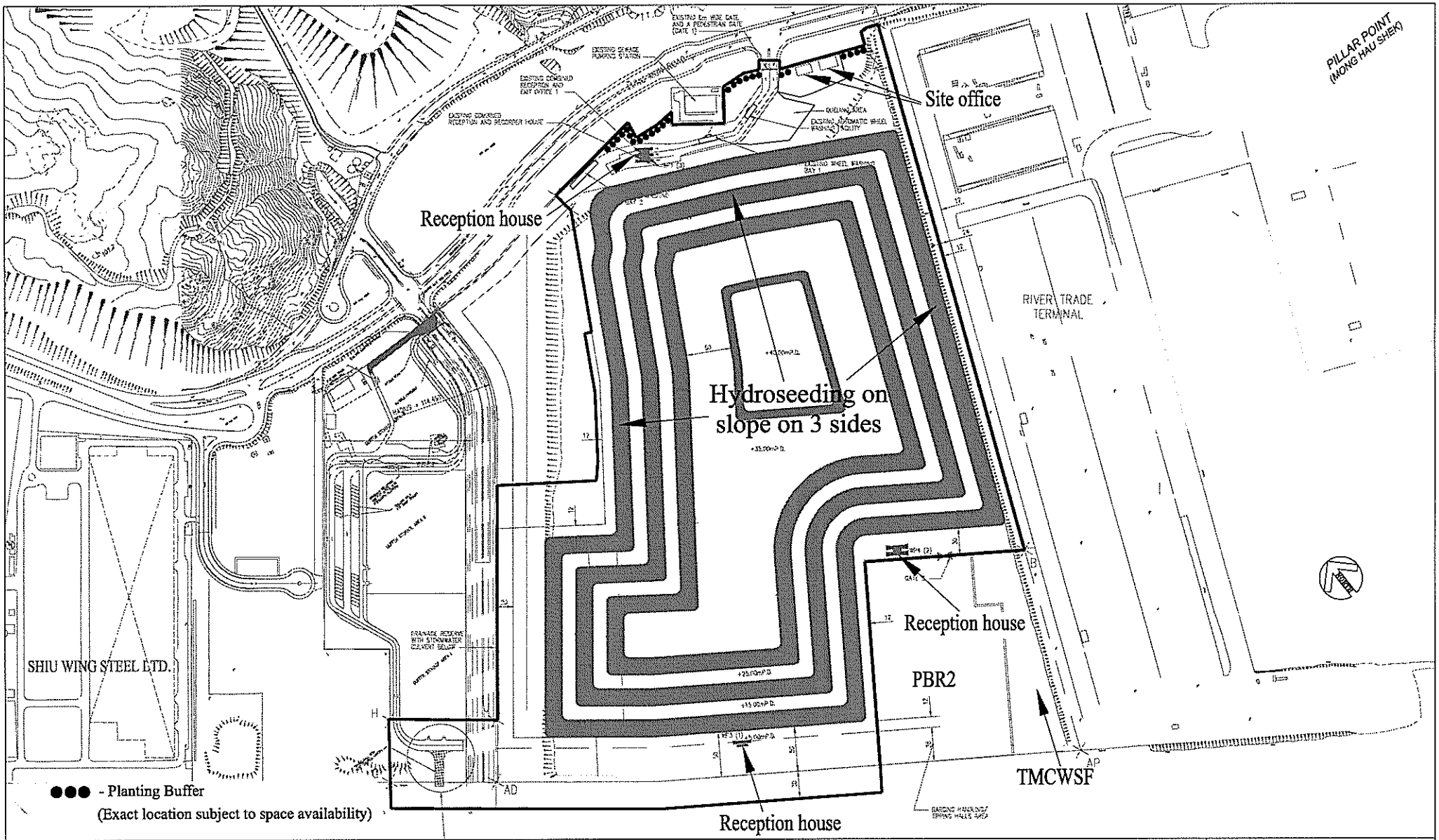
Source: TDD Website at http://www.info.gov.hk/tdd/major/improvement.htm

CH2M-IDC Hong Kong Limited	PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38	土木工程拓展署 Civil Engineering and Development Department
	Existing Traffic Noise Mitigation Measures Provided at Lung Fu Road and Wong Chu Road	SCALE NA DATE NOV 2004 DESIGNED CC DRAWN WAN FIGURE 9 REV 0



FM1, FM2 - Impact Monitoring Stations
FC1, FC2 - Control Stations

CH2M-IDC Hong Kong Limited	PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38	土木工程拓展署 Civil Engineering and Development Department
	Locations of the Existing Control and Impact Water Quality Monitoring Stations	SCALE NTS DATE NOV 2004 DESIGNED CC DRAWN WAN FIGURE 10 REV 2



CH2M-IDC Hong Kong Limited	**PROJECT PROFILE FOR EXPANSION AND EXTENSION OF FILL BANK AT TUEN MUN AREA 38**	土木工程拓展署 Civil Engineering and Development Department
	Proposed Landscape and Visual Mitigation Measures	SCALE: NTS; DATE: DEC 2004 DESIGNED: CC; DRAWN: BH FIGURE 11; REV 2