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Tsuen Wan Bay Further Reclamation, Area 35

Engineering, Planning and Environmental Investigation

荃灣海灣進一步的填海工程 - 第 35 區

工程、規劃及環境研究

**VOLUME 3 OF 3 : TANG LUNG CHAU DANGEROUS GOODS ANCHORAGE
EIA EXECUTIVE SUMMARY**

卷三 : 燈籠洲危險貨品船隻碇泊區
環境影響評估執行摘要

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MAUNSELL CONSULTANTS ASIA LTD
茂盛（亞洲）工程顧問有限公司

**AGREEMENT NO. CE 26/94
TSUEN WAN BAY FURTHER RECLAMATION, AREA 35
TANG LUNG CHAU DGA
ENVIRONMENTAL IMPACT ASSESSMENT STUDY**

EXECUTIVE SUMMARY

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1. INTRODUCTION

1.1 Background

The Territory Development Department commissioned Maunsell Consultants Asia Ltd. to undertake the “*Tsuen Wan Bay Further Reclamation, Area 35 - Planning, Environmental and Engineering Investigations*” study on 20 June 1995. As a result of the proposed reclamation, existing marine facilities including the Tsuen Wan Public Cargo Working Area and Tsuen Wan Dangerous Goods Anchorage (TWDGA) will have to be relocated to allow Tsuen Wan Bay Further Reclamation (TWBFR) to proceed. The Marine Department (MD) has commissioned separate site search studies for relocating the TWDGA. The “*Tsuen Wan Dangerous Goods Anchorage: Alternative Site Search Study - Stage 2 Study*” (the Site Search Study) undertaken by MD has recommended a site to the south of Ma Wan and adjacent to Tang Lung Chau (now known as the Tang Lung Chau site) as the most preferred site for the DGA. The Site Search Study was completed in early 1996 with an Initial Environmental Impact Assessment (IEIA). Following completion of the IEIA, a more detailed quantitative water quality impact assessment was carried out as the initial assessment was not detailed enough to demonstrate that the Tang Lung Chau site would not result in any insurmountable water quality impacts. Upon confirmation that the Tang Lung Chau site is feasible in terms of overall hydraulics and water quality impacts, work related to the Detailed Environmental Impact Assessment (DEIA) of the Tang Lung Chau DGA (TLCDGA) commenced.

1.2 Purpose and Objectives of the DEIA Study

The purpose of this DEIA Study is to assess the key environmental issues arising from the construction and operation of the DGA next to Tang Lung Chau, and to propose mitigation measure requirements for all identified adverse environmental impacts. In addition, environmental monitoring and audit requirements necessary to ensure the implementation and effectiveness of the recommended mitigation measures will be specified.

1.3 Overall Approach to the DEIA Study

The key environmental issues addressed in the DEIA Study comprise issues related to the following areas:

- water quality impact;
- hazard assessment (review the risk findings of Site Search Study);
- environmental impact related to oil/chemical spillage arising from the operation of the TLCDGA;
- dredging impact;
- ecological impact including fisheries impact;
- noise impact;
- air quality impact; and
- waste impact.

In accordance with the Study Brief, the scope of the DEIA includes the recommendation of mitigation measures, identification of residual impacts and proposing EM&A requirements for the project. It should be highlighted that site selection is outside the scope of work for the DEIA. The hazard assessment undertaken of the proposed DGA considers the potential off-site risk from the operation of the TLCDGA, in accordance with the requirements of the *Technical Memorandum (TM) on Environmental Impact Assessment Process*.

coastline of Tang Lung Chau facing the DGA. The effective area of the DGA is calculated to be 44.8 ha, as measured in line with the MD's criteria.

The construction of the TLC DGA will involve a total length of 3,372 m of breakwaters. Breakwater construction will require the removal of soft marine deposits from seabed trench for the breakwater foundation and replacement with sandfill. Based on the most up-to-date information, underwater blasting of rock on the seabed would not be required. The south-west breakwater will be constructed first as this can help to protect the remaining construction work. This breakwater can minimize any down-time due to wave exposure from the south and effectively prevent cross traffic at a relatively early stage.

To meet the MD's minimum requirement of 3 m of soft material cover at the mooring anchorages for the safe mooring of vessels, a possible measure is the dumping of soft material to overlay the seabed where in-situ hard material is found in place. Following the completion of the breakwaters construction, it is proposed that filling materials be dumped at the necessary areas within the DGA to make up the required 3 m thickness of soft material at the mooring locations. It is anticipated that sediment plumes generated from this dumping will largely remain localized due to the weak tidal currents inside the DGA and be contained by the breakwaters, and thus no unacceptable impacts on water quality are anticipated at the sensitive receivers.

2.4 Programme

The latest estimate on the programme is for commencement of the works in late 2000. The overall construction schedule is of approximately 33 months duration. The completion of the works would be approximately mid 2003.

3. FINDINGS OF THE EVALUATION OF KEY ENVIRONMENTAL ISSUES

The findings of the prediction and evaluation of potential environmental impacts which may arise during the construction and operation phases of the TLC DGA are summarized below for each identified key issue.

3.1 Water Quality

The key issues during the construction phase would be potential impacts from dredging and sandfilling works for the breakwater foundations, the release of contaminants during dredging of marine sediment, and potential cumulative impacts on water quality should there be other marine-based projects in progress near the study area. During the operational phase, key water quality issues include local impacts related to the discharge of sewage from vessels inside the DGA and potential impacts from maintenance dredging. The criteria for evaluating impacts on marine water quality are given in Annex 6 of the *TM on EIA Process* and the applicable criteria have been adopted in this project.

The water sensitive receivers can be classified into two categories. The first group is the bathing beaches along the eastern coastline of Ma Wan, the southern coastline of the north-west New Territories, and the north-eastern coastline of Lantau. The second group of sensitive receivers is the Ma Wan fish culture zone on the western side of Ma Wan, which comprises of three gazetted areas at Kung Tsai Wan, Shek Tsai Wan and Tam Shui Wan.

Sediment plume modelling of the effects on water quality of fine sediment lost to suspension during dredging was conducted. A worst-case scenario was assumed for the sediment plume modelling, with loss rates for fine particles based on three open grab dredgers working concurrently without the

2. DESCRIPTION OF THE PROJECT

2.1 Site Location

The selected site for the TLCDDGA is located to the south of Ma Wan Island, adjacent to Tang Lung Chau, and in close proximity to the Ma Wan Fairway (**Figure 1.1**). The southern part of Ma Wan is currently zoned as Green Belt by the Outline Zoning Plan No. S/I-MWI/2. There is a traditional burial area at the southern tip, which is unpopulated and away from any major developments. The main populated areas are in the west to north-west of the Island. A comprehensive residential development has been approved by the Town Planning Board (TPB) to accommodate a total population of 11,536 in the northeastern 'Comprehensive Development Area' (CDA). The adjacent 'Village Type Development' zone will be developed to accommodate about 2,817 people. A developer has proposed a theme park (Ma Wan Park) at the western CDA, to the north of Lantau Link. The planning application for this proposed theme park has been approved by the TPB. In addition, there is a proposal for a "Film City" development at the 'Recreation Priority Area' zone to the south of Lantau Link. However, the TPB rejected the Section 17 Review submitted by the proponent for this development in June 1998.

2.2 Current Operations of the TWDGA

Dangerous goods (DG) vessels using the current TWDGA would be the potential users of the new TLCDDGA, which comprise vessels licensed to carry Category 2 DG (Liquified Gas) and Category 5 DG (Substances giving off inflammable vapours). The only restriction on the usage of the DGA is that vessels which are carrying Category 1 DG (Explosives) are not permitted to enter and use the DGA. From a study of the allocation of moorings at the TWDGA undertaken in 1998 and 1993, most of the vessels using the TWDGA moorings and anchorage are fuel delivery vessels (Category 5 DG, Class 3 fuel oils), typically carrying 400 tonnes of fuel. The largest vessel can have a fuel capacity of 1200 tonnes. The fuels carried by these vessels are diesel, kerosene and bunker fuel.

The TWDGA provides 72 moorings for DG vessels. Most of the DG vessels currently registered with a mooring at TWDGA are providing bunkering service between the oil terminals at Tsing Yi and ocean going vessels moored in Hong Kong waters (especially vessels moored in the Western Anchorage), container terminals and industrial areas such as the Tai Po Industrial area to the east of Hong Kong. An annual survey is conducted by MD to ensure that the vessels using the DGA meet the safety requirements of the MD. The "Declaration of Fitness for Vessel to Carry Petroleum" which specifies the type of DG cargo that the vessel is licensed to carry is renewed following satisfactory outcome of this survey.

From previous site surveys, the number of DG vessels found within the TWDGA ranged from a minimum of 9 by day up to a maximum of 25 by night. During typhoons a larger number of oil barges return to their moorings and/or the anchorage.

2.3 Configuration and Construction Method of the TLCDDGA

The shape of the TLCDDGA has been modified since its conception in the IEIA. Main features including the following have been investigated:

- the DGA is enclosed by breakwaters to prevent strong waves from entering the DGA; and
- at least two entrances to the DGA for emergency evacuation purposes.

The finalized layout plan is shown in **Figure 1.2**. The breakwaters are not physically connected to Tang Lung Chau because this will reduce potential ecological impacts on the strip of natural

prevailing environmental conditions (tide type, wind, etc), and have been used to assist in contingency planning. The identified sensitive receivers for impacts related to fuel spillage are the water sensitive receivers, as given in Section 3.1 above, and the ecological sensitive receivers, as described in Section 3.7 below.

The frequency of the worst-case spill from a 1,200 tonne vessel (loss of 90% of spill cargo) happening outside the DGA was found to be once in 2,600 years. For a smaller typical vessel of 400 tonnes capacity, the frequency of a spill event is estimated to be once in 190 years. These frequencies are considered to be low. The surface fuel thicknesses predicted at the sensitive receivers are for the event that no containment actions are implemented at the source of the spill nor mitigation measures implemented at the sensitive receivers, and thus represent likely maximum values.

The results of the fuel spill modelling indicate that the shortest time in which the fuel slick is shown to impact bathing beaches is within 1 hour for the two beaches on Ma Wan for a spill location near the northern entrance of the DGA (dry season tides). For the gazetted beaches along the southern coastline of the north-west New Territories, there is a time lag of at least 7 hours until the fuel slick affects the beaches. At the Ma Wan fish culture zone, the fuel slick is shown to first affect the fish culture zone at Kung Tsai Wan between 1 to 2 hours following a spill at the southern entrance of the DGA (dry season tides). MD have advised that their response time to activate the Oil Pollution Contingency Plan (OPCP) is within 2 hours in the harbour limit and that the same time frame shall apply to the DGA. For a fuel slick reaching the fish culture zone within 2 hours, it would require flood tide conditions in the dry season with an east-south wind direction. Coupled with the low frequency of a fuel spill event near the DGA southern entrance, the frequency of the spill reaching the fish culture zone within 2 hours is even lower. Anti-oil pollution equipment is available at gazetted bathing beaches and appropriate action will be taken in accordance with the OPCP in the event of a fuel spill. Therefore, oil pollution mitigation measures in addition to the OPCP are not considered to be required.

Prompt response action will be required in the event of a major fuel spill near the northern and southern entrances of the TLCDGA so as to limit the spread of fuel at the source and thereby minimize the potential for adverse environmental impacts at the two beaches on eastern Ma Wan and the Ma Wan fish culture zone. Provided that the protocols and operational procedures defined in the MD's OPCP are implemented immediately, it is considered that the risk posed to the marine environment would be minimized as far as possible.

If the fuel spill occurs within the DGA, it is shown that the majority of the fuel slick is contained by the breakwaters and that only very small quantities of fuel can pass through the northern entrance of the DGA. On examining possible spill plumes from chronic vessel seepage, it is found that the majority of the fuel seepage plume formed is likely to remain within the DGA due to the weak tidal currents inside the DGA. Furthermore, it is considered unlikely that any significant impacts on water quality would arise at the sensitive receivers due to the very low surface fuel thickness predicted.

3.3 Air Quality

The only source of dust during the construction of the DGA is likely to be the casting of concrete armours. This is not expected to result in unacceptable air quality impacts.

To assess potential odour emissions from the vessels within the DGA during operation, computer dispersion modelling was undertaken to determine the potential odour impacts in the vicinity of the proposed DGA based on the odour levels measured at the existing TWDGA. For the purpose of this assessment and as agreed with EPD, the guideline level of 5 odour units (OU) averaged over 5 seconds was adopted as the evaluation criteria (as given in Annex 4 of the *TM on EIA Process*).

employment of silt curtains. The predicted increases in suspended solids (SS) concentrations above ambient levels are less than 1 mg/L for all of the beaches except Tung Wan Tsai. The maximum predicted increases in SS concentrations at Tung Wan Tsai during the dry season spring tide and wet season neap tide are above the acceptable level stipulated by the Water Quality Objective (WQO). The full implementation of the recommended mitigation measures will be necessary to reduce impacts resulting from the dredging works to within acceptable levels. The recommended measures include the use of closed grab dredgers or trailing suction hopper dredgers (with no overflow), the specification of an upper limit on the dredging rate, and no concurrent dredging and sandfilling works. The dredging works are not anticipated to result in unacceptable impacts on water quality at the Ma Wan fish culture zone as the predicted maximum increases in SS concentrations do not exceed the WQO. From the results of the preliminary sediment quality analysis, the release of heavy metals from sediment pore water during dredging of contaminated sediment is not predicted to result in any adverse impacts on water quality.

The predicted increases in SS concentrations at the Ma Wan bathing beaches and fish culture zones during sandfilling by bottom dumping are well in exceedance of the WQO. Therefore sandfilling by bottom dumping is not considered to be an environmentally acceptable method. It is recommended that a pipeline be used to discharge the sandfill relatively close to the breakwater trench and thereby reduce the loss of fines to the water column. For the proposed mitigated method of sandfill placement, the maximum elevation in SS concentrations occurs at Tung Wan Tsai during the dry season spring tide and is within the allowable increase stipulated by the WQO. The mitigated sandfilling works are not anticipated to result in unacceptable impacts on water quality at the Ma Wan fish culture zone as the predicted maximum SS concentrations do not exceed the WQO.

Based on the available information, the potential has been identified for construction activities for the DGA to be concurrent with dredging and filling works for the Penny's Bay Reclamation and CT9 (including associated works at the West Sulphur Channel and South Tsing Yi Marine Borrow Areas). An assessment of potential cumulative impacts on water quality resulting from these concurrent works indicates that the predicted maximum increases in SS concentrations during the mitigated dredging and sandfilling works for the DGA construction are within the allowable increases stipulated by the WQO. Therefore, it is anticipated that the construction activities for the TLCDGA are unlikely to result in unacceptable impacts on water quality should there be marine-based works in progress near the study area for the Penny's Bay Reclamation and CT9.

Bacterial plume modelling was carried out to simulate the dispersion of bacteria generated from sewage discharged by vessels moored within the DGA. The results show that only minimal *Escherichia coli* (*E. coli*) concentrations well below acceptable levels occur at Tung Wan Tsai and Tung Wan beach. Bacterial concentrations at the Ma Wan fish culture zone would also be almost undetectable.

Based on the findings of the preliminary siltation study carried out to give an initial estimate of the likely sediment deposition rate within the DGA, the volume of maintenance dredging required within the DGA is minor in scale on comparison to the construction phase dredging. Sediment plumes generated during dredging will largely be contained by the breakwaters, due to the weak tidal currents within the DGA, and therefore no unacceptable impacts on water quality are anticipated to result at the sensitive receivers. Nevertheless, it is recommended that good operational practices be observed during maintenance dredging to minimize potential impacts on water quality.

3.2 Fuel Spillage

Simulations of the movement and shoreline stranding of fuel spilt at a site near the centre of the DGA and at sites near the northern and southern entrances were conducted for spring and neap tides in the dry and wet seasons for the defined worst-case scenario. The model results correspond to the

The purpose of the hazard assessment is to review and confirm that the potential hazard associated with the TLCDGA, as presented in the *Site Search Study*, is still valid in light of changes incurred since the assessment was carried out in 1995. The findings of the review confirm that the assumptions and assessment results of the 1995 *Site Search Study* are still applicable for the majority of the issues considered. For those assumptions that have changed since the *Site Search Study*, the findings of the review indicate that these modifications do not alter the individual risk and societal risk results as presented in the *Site Search Study*. Therefore, the individual risk and societal risk associated with the TLCDGA are acceptable according to the risk levels prescribed in Annex 4 of the *TM on EIA Process*.

The proposed "Film-City" development at south Ma Wan is an uncommitted private sector project and thus is considered to be out of the scope of the DEIA study. The planning application submitted under the Town Planning Ordinance for the proposed development was rejected by the TPB, as the proponent had failed to provide sufficient information in his submission to demonstrate that the proposed development is acceptable with respect to various aspects, including the risk issues in relation to the proposed TLCDGA. In fact, the proponent will be required to conduct necessary comprehensive risk assessment to demonstrate that the "Film City" development proposals are compatible with the proposed TLCDGA and to determine any requirements for mitigation measures to be implemented as part of the "Film City" development.

3.7 Ecology

The sensitive ecological receivers identified are:

- the Ma Wan fish culture zone;
- the fishery resources in the vicinity;
- beaches along the coastline of Ma Wan, southern North-West New Territories and Lantau;
- intertidal organisms on Tang Lung Chau; and
- Chinese White Dolphins (*Sousa chinensis*) which may be present in the area.

Dredging activities during the construction phase of the DGA are likely to locally increase the turbidity of water, smother or disturb sensitive species and modify the bottom substratum, and hence potentially affect the above sensitive receivers. The sediment plume modelling simulations predicted an elevation of SS concentrations which are in compliance with the WQO at the Ma Wan fish culture zone. Therefore, minimal impacts on the marine and coastal ecology are anticipated. The predicted ecological impacts are considered acceptable with respect to the evaluation criteria, as based upon the criteria given in Annexes 8 and 9 of the *TM on EIA Process*. It is considered that the loss of suspended sediment to the marine environment and the resulting impacts on ecological sensitive receivers can be minimized, provided that the recommended mitigation measures for dredging works are fully implemented.

The dredging works will result in a permanent loss of subtidal habitat of approximately 335,800 m². However, on considering potential benefits to the marine environment, the breakwaters can function as habitat enhancing devices by providing a surface area of 314,000 m². This surface area can serve as suitable hard substrates for the colonisation and establishment of intertidal and subtidal faunal assemblages.

In the event of a major fuel spill near the entrances of the DGA, the identified ecological sensitive receivers may be adversely affected. However, as described in Section 3.2 Fuel Spillage, the event frequency of a fuel spill near the DGA is low and the frequency of a fuel slick reaching the fish culture zone in less than 2 hours is even lower. Prompt response action will be required in the event of a major fuel spill near the southern entrance of the TLCDGA so as to minimize the potential for adverse environmental impacts at the Ma Wan fish culture zone. The immediate implementation of

The maximum distance of the 5 OU odour level contour was predicted to be around 500 m from the boundary of the proposed DGA. The identified air sensitive receivers include existing residents of Ma Wan Town and nearby villages, as well as the committed future development for residential use to the north-eastern side of Ma Wan. Since the nearest air sensitive receivers on Ma Wan are located more than 550m from the boundary of the DGA, it is not anticipated that there would be any exceedance of the odour limit of 5 OU at these air sensitive receivers. No air quality mitigation measures are therefore necessary during the operation of the DGA.

3.4 Noise

The IEIA concluded that there would be no exceedance of the Acceptable Noise Levels stipulated under the Noise Control Ordinance (NCO) during construction activities. In addition, the IEIA predicted that there would be no noise impact at the identified noise sensitive receivers (i.e. Ma Wan Town and nearby villages) from unmitigated operational activities. No significant difference in noise levels from the IEIA is anticipated for the proposed construction activities. Therefore no unacceptable noise impacts have been predicted during the construction and operational stages. Noise mitigation measures are thus not necessary during the construction and operation of the DGA.

3.5 Waste Management and Mud Contamination

The assessment has concluded that the potential impacts of the dredging works and associated dredged sediment disposal will be minimized, provided that the recommended mitigation measures including the procedures detailed in *Works Branch Technical Circular No. 22/92*, are strictly implemented. Dredged sediment identified as seriously contaminated material will require disposal at the East Sha Chau Contaminated Mud Pits. Dredged sediments classified as moderately contaminated will be suitable for disposal at a gazetted marine disposal ground. The quantities of contaminated and uncontaminated sediment and the required disposal ground allocation will be confirmed at the detailed design stage following detailed sediment quality analysis. It is therefore anticipated that no unacceptable impacts will result from the dredging, transport and disposal of the marine sediments.

The identified sensitive receivers for impacts related to waste management are the same sensitive receivers for water quality and ecological impacts described under Sections 3.1 and 3.7 respectively. It is anticipated that no adverse environmental impacts will arise during the construction period, provided that the non-sediment construction waste arisings are handled, transported and disposed of using approved methods and that no solid or liquid wastes enter the surrounding marine waters. Similarly, provided that the recommended mitigation measures are also followed during maintenance dredging, no unacceptable impacts on water quality and marine biota are anticipated. As discussed under Section 3.1 Water Quality, the results of the bacteria dispersion modelling indicate that minimal *E. coli* concentrations, well below acceptable levels, were predicted at the nearest sensitive receivers on Ma Wan.

3.6 Hazard

The proposed relocation of the DGA from Tsuen Wan Bay to Tang Lung Chau may result in potential hazards from the transport and storage of the dangerous goods to nearby populations on Ma Wan, the vessel population in the shipping channels, and the railway, road and ferry users. The off-site risk associated with the DGA has been the subject of a few recent assessments. The most relevant study is the *Site Search Study* conducted by MD in March 1995. The results suggested that the individual risk level is within the acceptable risk level and the societal risk level is within the as low as reasonably practicable (ALARP) region (Annex 4 of the *TM on EIA Process*).

be necessary to ensure that the correct disposal requirements for the various wastes generated from construction activities are enforced. It is recommended that if monitoring results indicate that the dredging or sandfilling works have caused an adverse impact on water quality at the Ma Wan fish culture zone and beaches on Ma Wan, the construction programme should be carefully reviewed so as to slow down the rate of dredging or sandfilling such that the water quality at these sensitive receivers is in compliance with the water quality criteria. The proposed EM&A requirements will be developed in detail in the EM&A Manual so as to ensure that the recommended mitigation measures are implemented and the environmental standards and criteria are achieved.

5. OVERALL CONCLUSIONS

It is considered that with the full and strict implementation of the recommended environmental protection and pollution control measures, that there will not be any insurmountable environmental impacts associated with the construction and operation of TLCDGA. In addition, no unacceptable residual impacts are anticipated to result from the implementation of the recommended mitigation measures.

the OPCP would ensure impacts upon the marine environment and ecological sensitive receivers would be minimized to the greatest extent possible.

Impacts from dredging on the Chinese White Dolphin are not considered to be significant as the area does not comprise a core area for these species as revealed by the sighting records. Potential impacts to the dolphin are primarily indirect including effects on food availability arising from sediment resuspension in the water column during dredging, and less significant direct impacts from noise disturbance and physical harm potential from vessel movements. Practicable efforts should be taken to minimize potential impacts on dolphins arising from the construction works. It is considered that the full implementation of the recommended water quality mitigation measures is likely to minimize the potential for impacts on dolphins from the DGA construction and operation.

4. RECOMMENDATIONS OF THE DEIA STUDY

Mitigation measures to be implemented during the construction and operation of the TLCDGA have been recommended. It is important that appropriate measures be undertaken to ensure that potential impacts on water quality during construction can be kept to within acceptable levels as defined by the WQO. The proper selection of methods of working for dredging and sandfilling will reduce the amount of sediment resuspension, and this in turn will minimize the potential for unacceptable water quality impacts.

The use of closed grab dredgers or trailing suction hopper dredgers (with no overflow) is recommended for the breakwater construction, together with the implementation of good operational practices and pollution avoidance measures during dredging and dumping. Special procedures for the avoidance of pollution during the dredging, transportation and disposal of contaminated marine sediment shall be followed.

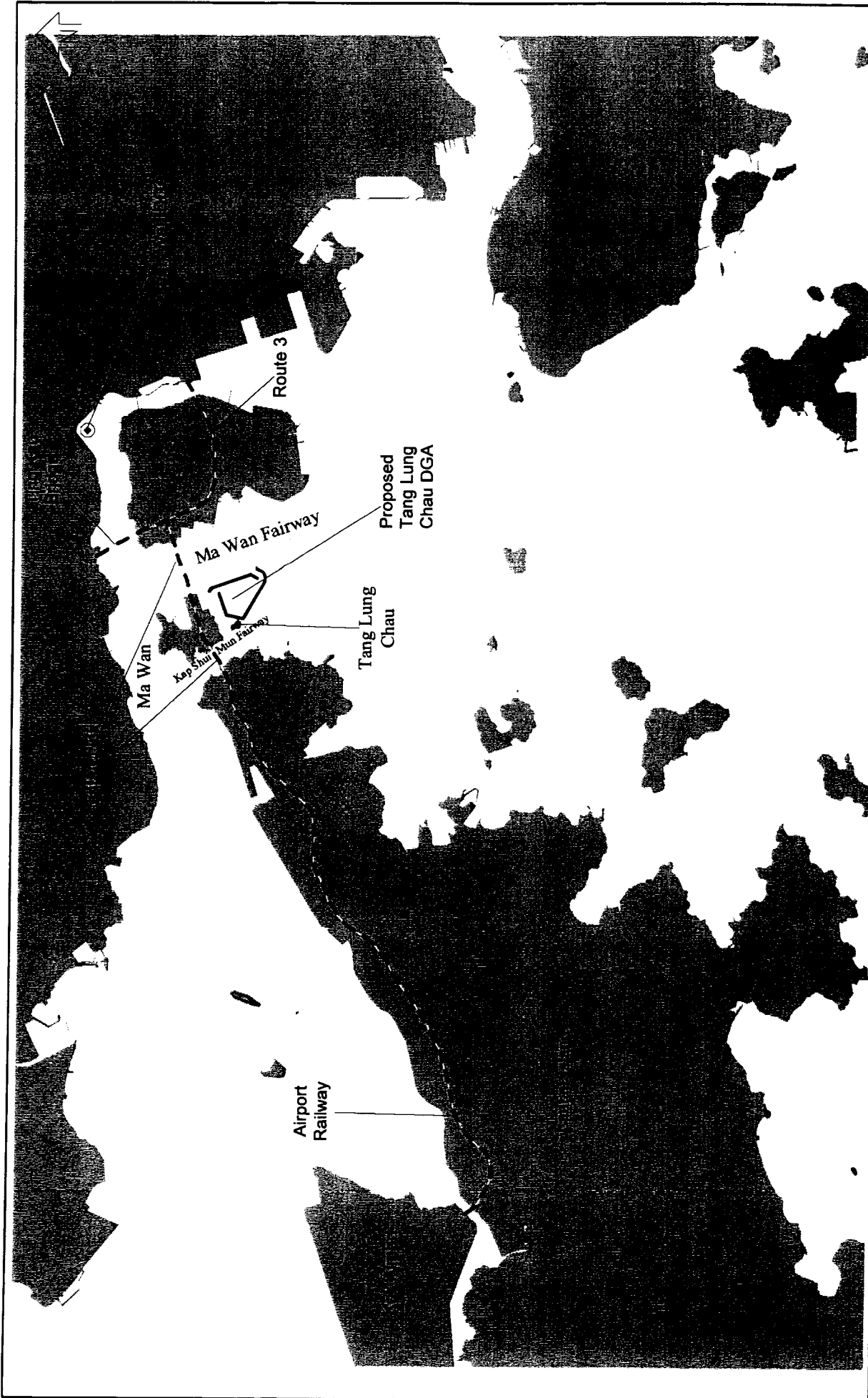
To further reduce the potential impact to the water sensitive receivers during the dredging works, particularly at the Ma Wan fish culture zone, it is also recommended to restrict the number of closed grab dredgers to not more than two working at one time as an additional mitigation measure.

It is recommended that the maximum total daily dredging rate during the DGA construction shall not exceed 9,524 m³/day (i.e. for dredging of both contaminated and uncontaminated sediment), as based on the reduced weekly production rate following adoption of the above additional mitigation measure. For dredging of contaminated sediment alone, the maximum daily dredging rate shall not exceed 7,143 m³/day, as based on the preliminary weekly production rate adopted in the water quality assessment of 50,000 m³/week.

For the proposed mitigated method of sandfill placement by pipeline discharge from a trailing suction hopper dredger, or other suitable vessel, it is recommended that the sandfill discharge rate shall not exceed 2,500 m³ over one hour. Dredging works and sandfill placement for the breakwater foundations shall not be carried out concurrently. This restriction on there being no concurrent dredging and sandfilling works includes such works for different stages of the breakwater construction at one time.

Further to the sediment sampling undertaken during this DEIA Study, a detailed sediment quality assessment to identify the location and extent of contaminated sediment will be carried out at detailed design stage and the findings presented in the Sediment Quality Report.

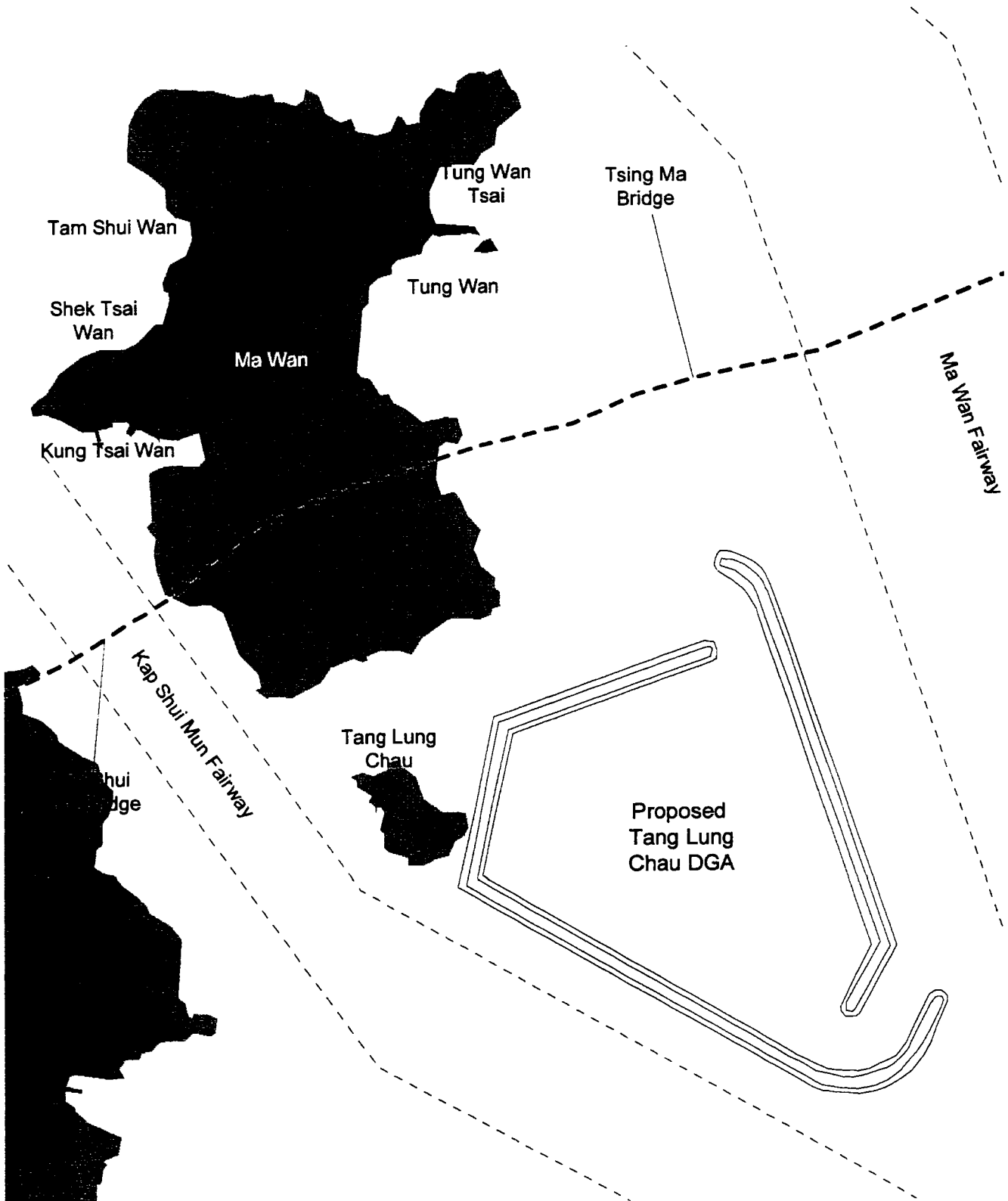
The environmental monitoring and audit (EM&A) requirements for the proposed TLCDGA have also been recommended. It is considered that EM&A will be necessary to monitor and audit the measures to mitigate any impacts on water quality resulting from construction of the DGA. EM&A will also



LOCATION PLAN OF TANG LUNG CHAU DANGEROUS GOODS ANCHORAGE (TLCDGA)

FIGURE 1.1

SCALE 1 : 120000



LAYOUT OF TANG LUNG CHAU
DANGEROUS GOODS ANCHORAGE (TLCDGA)

FIGURE	1.2
SCALE	1 : 16000