

ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE (CAP. 499)
SECTION 5 (7)

ENVIRONMENTAL IMPACT ASSESSMENT STUDY BRIEF NO. ESB-276/2014

PROJECT TITLE : POLICE FACILITIES IN KONG NGA PO
(hereinafter known as the "Project")

NAME OF APPLICANT : CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT
(hereinafter known as the "Applicant")

1. BACKGROUND

1.1 An application (No. ESB-276/2014) for an Environmental Impact Assessment (EIA) Study Brief under section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the Applicant on 23 July 2014 with a project profile (No. PP-512/2014) (the Project Profile).

1.2 The Project is to relocate a number of police facilities to Kong Nga Po. These include the Lo Wu Firing Range and the Helipad; the Ma Tso Lung Firing Range and the Weapon Training Facilities and Police Driving and Traffic Training Facilities at Fan Garden. The Project mainly comprises the following components:

- (i) reprovision for Lo Wu Firing Range with around 15,200m² platform area;
- (ii) reprovision for Ma Tso Lung Firing Range with around 750m² platform area;
- (iii) a helipad with around 5,041m² platform area;
- (iv) weapon training facilities with around 10,800m² platform area;
- (v) police driving and traffic training facilities with around 6.47ha platform areas;
- (vi) police training facility with around 15,000m² platform area; and
- (vii) improve about 1.8km of the existing Kong Nga Po Road to a local distributor.

Location of the Project as given in the Project Profile is reproduced in Appendix A of this study brief.

1.3 The Project consists of the following designated projects under Part I, Schedule 2 of the EIAO:

- (i) item B.2 – *A helipad within 300 m of existing or planned residential development;*
- (ii) item O.5 – *An open firing range.*

1.4 Pursuant to section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this EIA study brief to the Applicant to carry out an EIA study.

1.5 The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the Project and related activities that take place concurrently. This information will contribute to decisions by the Director on :

- (i) the acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;
- (ii) the conditions and requirements for the design, construction and operation of the Project to mitigate against adverse environmental consequences; and
- (iii) the acceptability of residual impacts after the proposed mitigation measures is implemented.

2. OBJECTIVES OF THE EIA STUDY

2.1 The objectives of the EIA study are as follows :

- (i) to describe the Project and associated works together with the requirements and environmental benefits for carrying out the Project;
- (ii) to identify and describe elements of community and environment likely to be affected by the Project and/or likely to cause adverse impacts to the Project, including natural and man-made environment and the associated environmental constraints;

- (iii) to identify and quantify emission sources (including air quality, noise, water quality, waste, etc. as appropriate) and determine the significance of impacts on sensitive receivers and potential affected uses;
- (iv) to identify and quantify any potential ecological impacts arising from the construction and operation of the project and to propose measures to mitigate these impacts;
- (v) to identify any potential landscape and visual impacts and to propose measures to mitigate these impacts;
- (vi) to identify and quantify the potential risks due to the potential land contamination in the Project site and to propose measures to mitigate these impacts;
- (vii) to propose the provision of infrastructure or mitigation measures to minimize pollution, environmental disturbance and nuisance during construction and operation of Project;
- (viii) to investigate the feasibility, practicability, effectiveness and implications of the proposed mitigation measures;
- (ix) to identify, predict and evaluate the residual environmental impacts (i.e. after practicable mitigation) and the cumulative effects expected to arise during the construction and operation phases of the Project in relation to the sensitive receivers and potential affected uses;
- (x) to identify, assess and specify methods, measures and standards, to be included in the detailed design, construction and operation of the Project which are necessary to mitigate these residual environmental impacts and cumulative effects and reduce them to acceptable levels;
- (xi) to investigate the extent of the secondary environmental impacts that may arise from the proposed mitigation measures and to identify constraints associated with the mitigation measures recommended in the EIA study, as well as the provision of any necessary modification;
- (xii) to design and specify environmental monitoring and audit requirements for

the effective implementation of the recommended environmental protection and pollution control measures; and

- (xiii) to identify any additional studies necessary to implement the mitigation measures or monitoring and proposals recommended in the EIA report.

3. DETAILED REQUIREMENTS OF THE EIA STUDY

3.1 The Purpose

- 3.1.1 The purpose of this study brief is to scope the key issues of the EIA study and to specify the environmental issues that are required to be reviewed and assessed in the EIA report. The Applicant has to demonstrate in the EIA report that the criteria in the relevant sections of the Technical Memorandum on the Environmental Impact Assessment Process of the Environmental Impact Assessment Ordinance (hereinafter referred to as “the TM”) are complied with.

3.2 The Scope

- 3.2.1 The scope of this EIA study shall cover the Project and associated works proposed in the Project Profile and mentioned in Section 1.2 above. The EIA study shall address the likely key issues described below, together with any other key issues identified during the course of the EIA study:
 - (i) the potential air quality impact on sensitive receivers from the construction and operation of the Project and associated works, the potential air quality impact on the Project from the air pollutant emission sources (such as vehicular and helicopter emissions) and the potential odour impacts and nuisances from the firing ranges; etc with a view to assessing and recommending sound engineered mitigation proposal(s) to avoid or minimize such impacts and nuisances to the maximum extent practicable;
 - (ii) the potential noise impact on sensitive receivers caused by the Project and associated works, including the impact from construction equipment during construction, and operational noise impacts from road traffic, helicopters take-off, approach and associated ground operation, firing ranges, driving training track; and any other fixed noise sources;

- (iii) potential hazard to life impact given that part of the Project site is within the consultation zone of the Sheung Shui Water Treatment Works (SSWTW); and in case of any helicopter refuelling facilities on site;
- (iv) potential impacts to water quality or ecological habitat(s) due to the discharge of stormwater, surface runoff, treated effluent and other effluents generated from the facilities during the construction and operation phases, taking into account the cumulative impact from the construction and operation of existing, committed and planned projects in the vicinity of the Project;
- (v) potential sewerage and sewage treatment implications to cope with discharges from population and any development from the Project, taking into account the capacity requirements for the existing, committed and planned developments within the same sewage catchment;
- (vi) potential waste management issues and impacts during construction and operation of the Project;
- (vii) potential aquatic and terrestrial ecological impacts arising from the construction and operational phases, including loss of habitats, removal of vegetation, the impact and disturbance to animals and plants. The assessment shall identify and evaluate all direct, indirect and cumulative impacts resulting from the Project during the construction and the operational phases. Any adverse impacts shall be fully addressed and mitigated;
- (viii) potential landscape and visual impacts during the construction and operation of the Project on the nearby sensitive receivers, including but not limited to the nearby village houses and proposed residential development in Hung Lung Hang; and
- (ix) potential cumulative impacts of the Project, through interaction or in combination with other existing, committed and planned projects in the vicinity of the Project including but not limited to the proposed Organic Waste Treatment Facilities Phase 2, proposed Man Kam To Development Corridor and the Columbarium, Crematorium and related facilities at Sandy Ridge Cemetery and that those impacts may have a bearing on the environmental acceptability of the Project.

3.3 Description of the Project

3.3.1 The Applicant shall provide information on the background and history of the Project, including consideration given to different options as described in Sections 3.3.2 and 3.3.3 below. The Applicant shall describe and compare the environmental benefits and disbenefits of the scenarios with or without the Project.

3.3.2 Consideration of Alternative Siting and Layout

The Applicant shall present in the EIA report the consideration of alternatives of the Project, including alternative siting or layouts, with a view to avoiding adverse environmental impacts during construction and operation of the Project.

3.3.3 Consideration of Alternative Construction Methods and Sequences of Works

Taking into consideration of the combined effect with respect to the severity and duration of the construction impacts to the affected sensitive receivers, the EIA study shall describe alternative construction methods and sequences of works of the Project with a view to avoiding adverse environmental impact during construction of the Project.

3.3.4 Selection of Preferred Scenario

The Applicant shall, taking into consideration of the findings in Sections 3.3.2 and 3.3.3 above, describe the reasons for selecting the proposed Project or its siting and alignment and the part that environmental factors played in the selection.

3.4 Technical Requirements

3.4.1 The Applicant shall conduct the EIA study to address the environmental aspects described in Sections 3.1, 3.2 and 3.3 above. The assessment shall be based on the best and latest information available during the course of the EIA study. The Applicant shall include in the EIA report details of the construction programme and methodologies. The Applicant shall assess the cumulative environmental impacts from the Project and interacting projects as identified in the EIA study. The EIA study shall include the following technical requirements on specific impacts.

3.4.2 Air Quality Impact

- 3.4.2.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing air quality impact as stated in section 1 of Annex 4 and Annex 12 of the TM.
- 3.4.2.2 The study area for air quality impact assessment shall be defined by a distance of 500 meters from the boundary of the Project site which shall be extended to include major existing, planned and committed air pollutant emission sources that may have a bearing on the environmental acceptability of the Project. The assessment shall include the existing, planned and committed sensitive receivers within the study area as well as areas where air quality may be potentially affected by the Project. The assessment shall be based on the best available information at the time of the assessment.
- 3.4.2.3 The assessment of air quality impact arising from the construction and operation of the Project shall be conducted in accordance with the technical requirements in Appendix B of this EIA Study Brief.

3.4.3 Noise Impact

- 3.4.3.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing noise impact as stated in Annexes 5 and 13 of the TM.
- 3.4.3.2 Assessment shall include construction noise, road traffic noise, fixed noise sources and helicopter noise impact assessment of the existing, committed and planned NSRs earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans, Layout Plans and other relevant published land use plans, including plans and drawings published by the Lands Department and any land use and development applications approved by the Town Planning Board, in the vicinity of the project.
- 3.4.3.3 The noise impact assessment for construction and operation of the Project shall follow the detailed technical requirements given in Appendix C.

3.4.4 Water Quality Impact

- 3.4.4.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing water pollution as stated in Annexes 6 and 14 of the TM.

3.4.4.2 The study area for the water quality impact assessment shall include areas within 500 metres from the site boundary of the Project and shall cover the Deep Bay Water Control Zone as designated under the Water Pollution Control Ordinance (Cap 358) and water sensitive receivers in the vicinity of the Project. The study area shall be extended to include other areas if they are found also being impacted during the course of the EIA study and have a bearing on the environmental acceptability of the Project.

3.4.4.3 The water quality impact assessment for construction and operation of the Project shall follow the detailed technical requirements given in Appendix D.

3.4.5 Sewerage and Sewage Treatment Implications

3.4.5.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing impacts on the downstream public sewerage, sewage treatment and disposal facilities as stated in section 6.5 in Annex 14 of the TM respectively.

3.4.5.2 The assessment of the sewerage and sewage treatment implications for the Project shall follow the detailed technical requirements given in Appendix E of this EIA Study Brief.

3.4.6 Waste Management Implications

3.4.6.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing waste management implications as stated in Annexes 7 and 15 of the TM respectively.

3.4.6.2 The assessment of the waste management implications arising from construction and operation of the Project shall follow the detailed technical requirements given in Appendix F.

3.4.7 Land Contamination

3.4.7.1 The Applicant shall follow the guidelines for evaluating and assessing potential land contamination issue as stated in Section 3.1 of Annex 19 of the TM.

3.4.7.2 The assessment of the potential land contamination issue shall follow the detailed requirements given in Appendix F.

3.4.8 Ecological Impact (Terrestrial and Aquatic)

- 3.4.8.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing ecological impact as stated in Annexes 8 and 16 of the TM.
- 3.4.8.2 The assessment area for the purpose of this ecological impact assessment shall include areas within 500m distance from the boundary of the Project and any other areas likely to be impacted by the Project. For aquatic ecology, the assessment area shall be the same as the water quality impact assessment described in section 3.4.4.
- 3.4.8.3 The ecological impact assessment for construction and operation of the Project shall follow the detailed technical requirements given in Appendix G.

3.4.9 Landscape and Visual Impacts

- 3.4.9.1 The Applicant shall follow the criteria and guidelines as stated in Annexes 10 and 18 of the TM and the EIAO Guidance Note No.8/2010 on “Preparation of Landscape and Visual Impact Assessment under the Environmental Impact Assessment Ordinance” for evaluating and assessing the landscape and visual impacts.
- 3.4.9.2 The assessment area for landscape impact assessment shall include all areas within a 500m distance from the site boundary of the Project. The assessment area for the visual impact assessment shall be defined by the visual envelope of the Project.
- 3.4.9.3 The landscape and visual impact assessments for construction and operation of the Project shall follow the detailed technical requirements given in Appendix H.

3.4.10 Impact of Hazard to Life

- 3.4.10.1 The Applicant shall follow the criteria for evaluating hazard to life as stated in Annex 4 of the TM.
- 3.4.10.2 The hazard assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix I of this EIA Study Brief.

3.4.11 Presentation of Summary Information of Environmental Outcomes

3.4.11.1 Summary of Environmental Outcomes

The EIA report shall contain a summary of key environmental outcomes arising from the EIA study, including environmental benefits of the Project and the environmental protection measures recommended, population and environmentally sensitive areas protected, recommended environmentally friendly designs, key environmental problems avoided and any compensation areas included.

3.4.11.2 Summary of Environmental Impacts

To facilitate effective retrieval of pertinent key information, the EIA report shall contain a summary table of environmental impacts showing the assessment points, results of impact predictions, relevant standards or criteria, extents of exceedances predicted, impact avoidance measures considered, mitigation measures proposed and residual impacts (after mitigation). This summary shall cover each individual impact and shall form an essential part of the executive summary of the EIA report.

3.4.12 Environmental Monitoring and Audit (EM&A) Requirements

3.4.12.1 The Applicant shall identify and justify in the EIA study whether there is any need for EM&A activities during the construction and operation phases of the Project and, if affirmative, define the scope of EM&A requirements for the Project in the EIA study.

3.4.12.2 Subject to the confirmation of the EIA study findings, the Applicant shall follow the guidelines for an EM&A programme as stated in Annex 21 of the TM.

3.4.12.3 The Applicant shall prepare a Project Implementation Schedule in the form of a checklist as shown in Appendix J of this EIA study brief. It shall contain the EIA study recommendations and mitigation measures with reference to the implementation programme.

4 DURATION OF VALIDITY

4.1 The Applicant shall notify the Director of the commencement of the EIA study. If the EIA study does not commence within 36 months after the date of issue of this EIA study brief, the Applicant shall apply to the Director for a fresh EIA study brief before commencement of the EIA study.

5 REPORT REQUIREMENTS

- 5.1 In preparing the EIA report, the Applicant shall refer to Annex 11 of the TM for the contents of an EIA report. The Applicant shall also refer to Annex 20 of the TM, which stipulates the guidelines for the review of an EIA report. The Applicant shall accompany with the submission of the EIA report a summary, pointing out where in the EIA report the respective requirements of this EIA Study have been addressed and fulfilled.
- 5.2 The Applicant shall supply the Director with hard and electronic copies of the EIA report and the executive summary in accordance with the requirements given in Appendix K. The Applicant shall, upon request, make additional copies of EIA report/documents available to the public, subject to payment by the interested parties of full costs of printing.

6 OTHER PROCEDURAL REQUIREMENTS

- 6.1 If there is any change in the name of Applicant for this EIA study brief during the course of the EIA study, the Applicant must notify the Director immediately.
- 6.2 If there is any key change in the scope of the Project mentioned in Section 1.2 of this EIA study brief and in Project Profile (No. PP-512/2014), the Applicant must seek confirmation from the Director in writing on whether or not the scope of issues covered by this EIA study brief can still cover the key changes, and the additional issues, if any, that the EIA study must also address. If the changes to the Project fundamentally alter the key scope of the EIA study brief, the Applicant shall apply to the Director for a fresh EIA study brief.

7. LIST OF APPENDICES

- 7.1 This EIA study brief includes the following appendices
- Appendix A – Project Location Plan
 - Appendix B – Requirements for Air Quality Impact Assessment
 - Appendix C – Requirements for Noise Impact Assessment
 - Appendix D – Requirements for Water Quality Impact Assessment
 - Appendix E – Requirements for Assessment of Sewerage and Sewage Treatment Implications

Appendix F – Requirements for Assessment of Waste Management Implication
and Land Contamination

Appendix G – Requirements for Ecological Impact Assessment (Terrestrial and
Aquatic)

Appendix H – Requirements for Landscape and Visual Impact Assessments

Appendix I – Requirements for Hazard to Life Assessment

Appendix J – Implementation Schedule

Appendix K – Requirements for EIA Report Documents

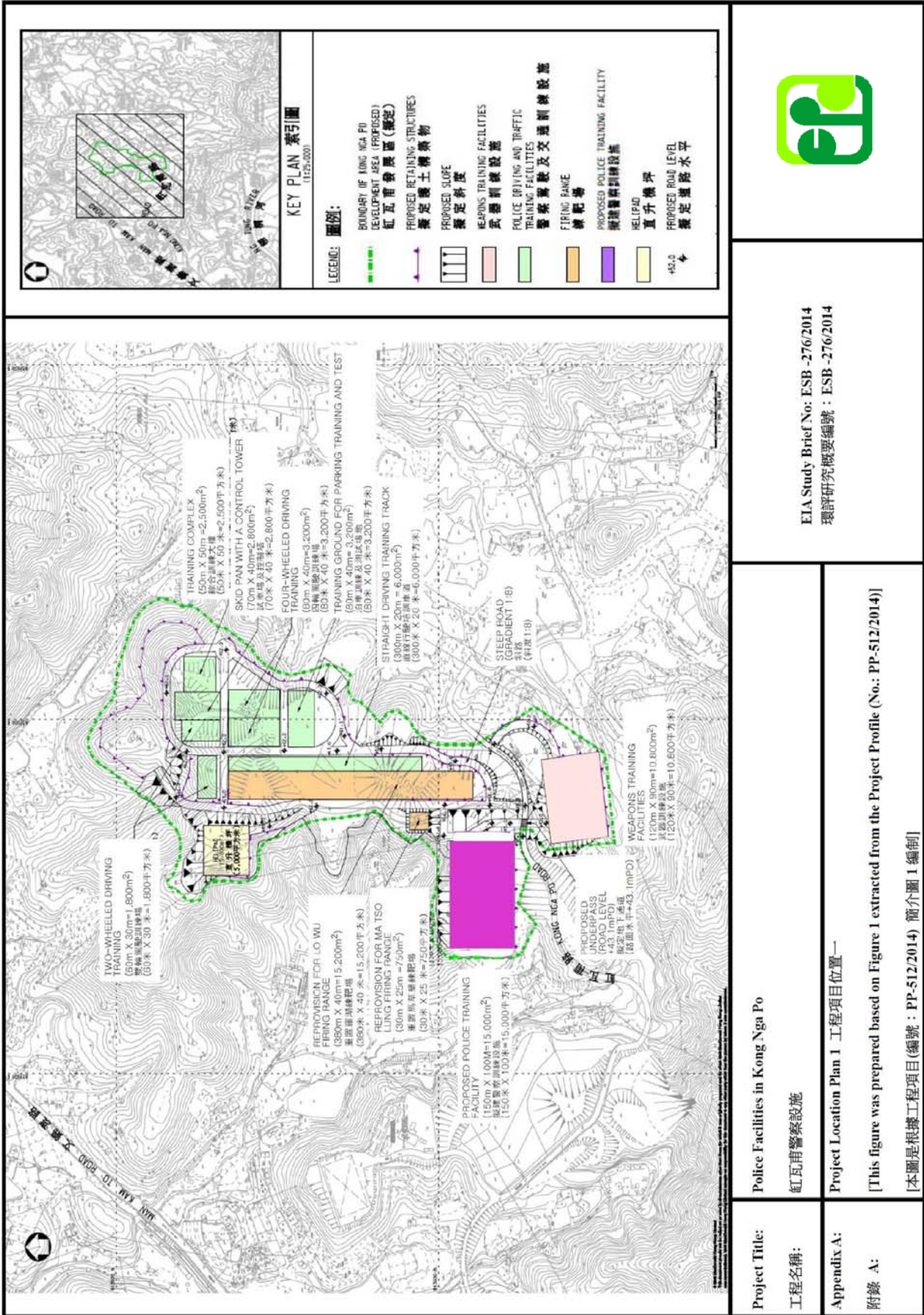
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September 2014

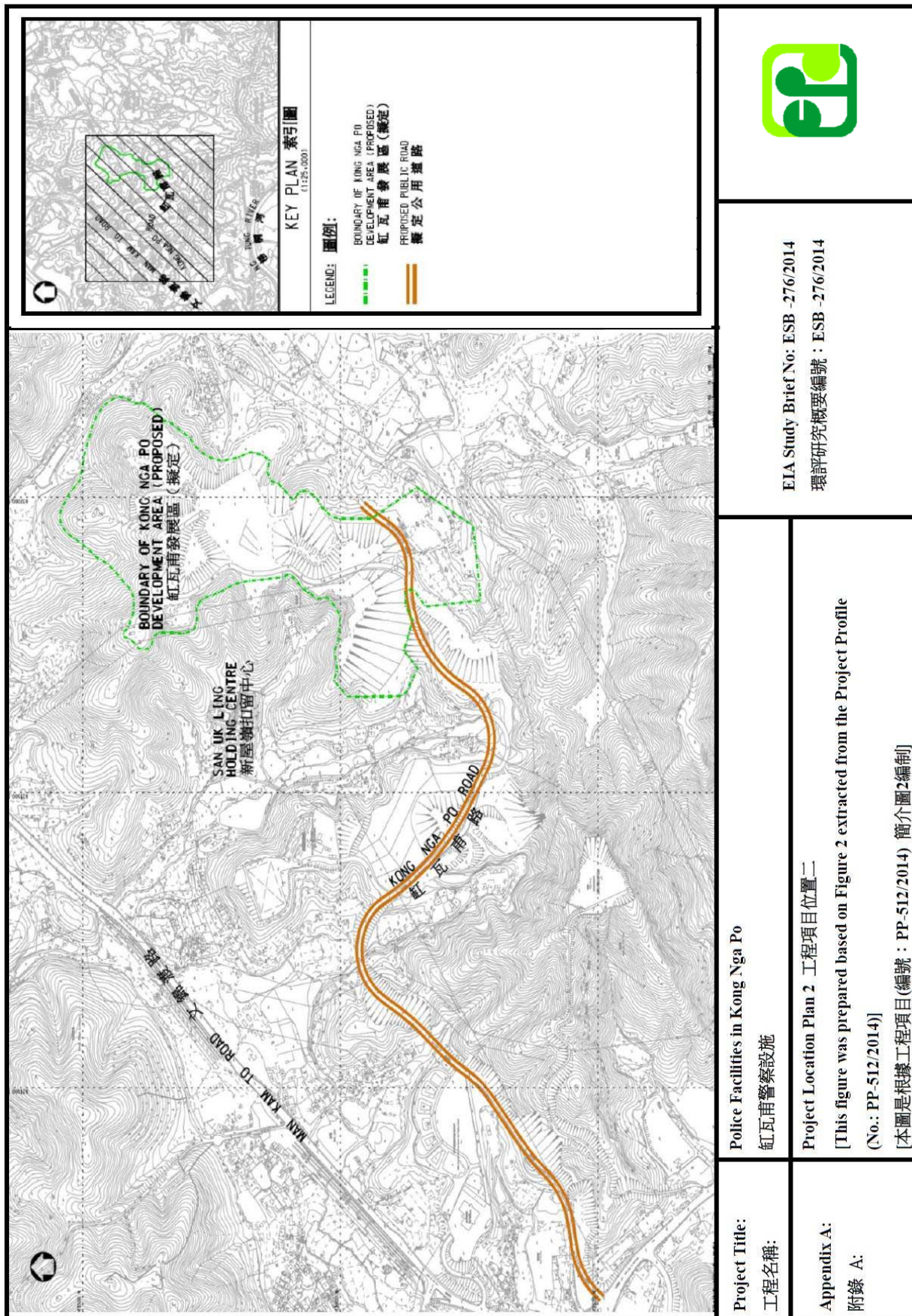
Environmental Assessment Division

Environmental Protection Department

Appendix A



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Appendix B**Requirements for Air Quality Impact Assessment**

The air quality impact assessment shall include the following:

1. Background and Analysis of Activities
 - (i) Provision of background information relating to air quality issues relevant to the Project, e.g. description of the types of activities of the Project that may affect air quality during construction and operation stages of the Project.
 - (ii) Provision of an account, where appropriate, of the consideration/ measures that have been taken into consideration during the planning of the Project to abate the air pollution impact. The Applicant shall consider alternative layout, alternative construction methods/phasing programmes, and alternative operation modes to minimize the air quality impact during construction and operation stages of the Project.
 - (iii) Presentation of background air quality levels in the study area for the purpose of evaluating cumulative air quality impacts during construction and operation stages of the Project. If PATH (Pollutants in the Atmosphere and their Transport over Hong Kong) model is used to estimate the background air quality, details for the estimation of the emission sources to be adopted in the model runs should be clearly presented.
2. Identification of Air Sensitive Receivers (ASRs) and Examination of Emission/ Dispersion Characteristics
 - (i) Identification and description of existing, planned and committed ASRs that would likely be affected by the Project, including those earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans and other relevant published land use plans, including plans and drawings published by Lands Department and any land use and development applications approved by the Town Planning Board. The Applicant shall select the assessment points of the identified ASRs that represent the worst impact point of these ASRs. A map clearly showing the location and description such as name of buildings, their uses and height of the selected assessment points shall be given. The separation distances of these

ASRs from the nearest emission sources shall also be given.

(ii) Provision of a list of air pollution emission sources, including any nearby emission sources which are likely to have impact related to the Project based on the analysis of the construction and operation activities in Section 1 above. Examples of construction stage emission sources include stock piling, concrete batching, material handling and vehicular movements on unpaved haul roads on site, etc. Examples of operational stage emission sources include exhaust emissions from motor vehicles and helicopters, lead dust emissions of lead, dust and odour from the firing ranges, etc. The Applicant shall also identify chimneys and obtain relevant chimney emission data in the study area by carrying out a survey for assessing the cumulative air quality impact of air pollutants through chimneys. The Applicant shall ensure and confirm that the chimney emission data used in their assessment have been validated and updated by their own survey. If there are any errors subsequently found in their chimney emission data used, the Applicant shall be fully responsible and the submission might be invalidated. Confirmation regarding the validity of assumptions and the magnitude of activities (e.g. volume of construction material to be handled, odour emission strength, etc.) shall be obtained from the relevant government departments/authorities and documented in the EIA report.

(i) The emissions from any concurrent projects identified as relevant during the course of the EIA study shall be taken into account as contributing towards the overall cumulative air quality impact. The impact at the existing, committed and planned ASRs within the assessment area shall be assessed, based on the best information available at the time of assessment.

3. Construction Phase Air Quality Impact

(i) The Applicant shall follow the requirements stipulated under the Air Pollution Control (Construction Dust) Regulation to ensure that construction dust impacts are controlled within the relevant standards as stipulated in Section 1 of Annex 4 of the TM. A monitoring and audit programme for the construction phase of the Project shall be devised to verify the effectiveness of the proposed control measures so as to ensure proper control of fugitive dust emission.

(ii) If the Applicant anticipates that the Project will give rise to significant

construction dust impacts likely to exceed recommended limits in the TM at the ASRs despite the incorporation of the dust control measures proposed, a quantitative assessment shall be carried out to evaluate the construction dust impact at the identified ASRs. The Applicant shall follow the methodology set out in Section 5 below when carrying out the quantitative assessment.

- (iii) The applicant shall ensure that any odour emission resulting from the construction activities of the Project is properly controlled and meet the relevant criteria as stipulated in Section 1 of Annex 4 of the TM. A monitoring and audit programme for the construction phase of the Project shall be devised to verify the effectiveness of the proposed control measures so as to ensure proper odour emission control.

4. Operational Phase Air Quality Impact

- (i) The Applicant shall assess the potential air quality impacts at the identified ASRs, including emissions from motor vehicles, helicopters, and firing ranges during operating condition of the Project. The evaluation shall be based on the strength of the emission sources identified in Section 2 above. The Applicant shall follow the methodology set out in section 5 below when carrying out the assessment.
- (ii) If the Applicant anticipates that the Project will give rise to significant operational phase air quality impacts likely to exceed the recommended limits in the TM at the ASRs, a quantitative assessment should be carried out to evaluate the operational phase air quality impacts at the identified ASRs. The Applicant shall follow the methodology set out in Section 5 below when carrying out the quantitative assessment. A monitoring and audit programme for the operational stage shall be devised to verify the effectiveness of the control measures proposed so as to ensure proper operational odour control.

5. Quantitative Assessment Methodology

- (i) The Applicant shall apply the general principles enunciated in the modeling guidelines in Appendices B1 while making allowance for the specific characteristic of the Project. This specific methodology must be documented in such level of details, preferably assisted with tables and diagrams, to allow the readers of the EIA report to grasp how the model has been set up to simulate the situation under study without referring to the model input files.

Detailed calculations of air pollutants emission rates for input to the modelling shall be presented in the EIA report. The Applicant must ensure consistency between the text description and the model files at every stage of submissions for review. In case of doubt, the Applicant shall seek prior agreement from the Director on the specific modelling details.

- (ii) The Applicant shall identify the key/representative air pollution parameters (types of pollutants and averaging time concentrations) to be evaluated and provide explanation for selecting such parameters for assessing the impact from the Project. Ozone Limiting Method (OLM) or Discrete Parcel Method (DPM) or other method to be agreed with the Director shall be used to estimate the conversion ratio of NO_x to NO₂ if NO₂ has been identified as a key air pollutant.
- (iii) Calculation of the relevant pollutant emission rates for input to the model and a map showing the emission sources shall be presented in the EIA report. A summary table of the emission rates shall be presented in the EIA report. The Applicant shall ensure consistency between the text description and the model files at every stage of submission for review.
- (iv) The Applicant shall calculate the overall cumulative air quality impact at the ASRs identified under Section 2 above and compare these results against the criteria set out in section 1 of Annex 4 in the TM. The predicted air quality impacts (both unmitigated and mitigated) shall be presented in the form of summary table(s) and pollution contours, to be evaluated against the relevant air quality standards and on any effect they may have on the land use implications. Plans of a suitable scale should be used to present pollution contours to allow buffer distance requirements to be determined properly.

6. Mitigation Measures for Air Quality Impact

Consideration of Mitigation Measures

- (i) The Applicant shall consider mitigation measures to reduce the air quality impact on the identified ASRs when the predicted air quality impact exceeds the criteria set in section 1 of Annex 4 in the TM, The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be assessed and documented in the EIA report. The Applicant shall demonstrate quantitatively whether the residual impacts after incorporation of

the proposed mitigating measures will comply with the criteria stipulated in Section 1 of Annex 4 in the TM. Specific reasons for not adopting certain workable mitigation measures to reduce the air quality to a level meeting the criteria in the TM or to maximize the protection of the ASRs as far as possible should be clearly substantiated and documented in the EIA report.

Evaluation of Residual Air Quality Impact

- (ii) Upon consideration of mitigation measures, if the mitigated air quality impact still exceeds the relevant criteria in Annex 4 of the TM, the Applicant shall identify, predict, evaluate the residual air quality impact in accordance with Section 4.4.3 of the TM and estimate the total number of existing dwellings, classrooms and other air sensitive elements that will be exposed to residual air quality impacts exceeding the criteria set in Annex 4 in the TM.

7. Submission of Model Files

Input and output files of the model run(s), including those files for the generation of pollution contours as well as the emissions calculation worksheets, shall be submitted to the Director in electronic format together with the submission of the EIA report.

Air Quality Modelling Guidelines

[The information contained in this Appendix is meant to assist the Applicant in performing the air quality assessment. The Applicant must exercise professional judgment in applying this general information.]

The air quality modelling guidelines shall include the following guidelines as published on the website of the Environmental Protection Department (http://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/guide_aqa_model.html):

- i) Guidelines on Choice of Models and Model Parameters;
- ii) Guidelines on Assessing the "Total" Air Quality Impact (Revised);
- iii) Guidelines on the Use of Alternative Computer Models in Air Quality Assessment (Revised);
- iv) Guidelines on the Estimation of PM_{2.5} for Air Quality Assessment in Hong Kong; and
- v) Guidelines on the Estimation of 10-minute Average SO₂ Concentration for Air Quality Assessment in Hong Kong.

Requirements for Noise Impact Assessment

The noise impact assessment shall include the following:

1. Description of the Noise Environment

- 1.1 The Applicant shall describe the prevailing noise environment in the EIA report.
- 1.2 The Applicant shall conduct prevailing background noise surveys to determine the standards for evaluating noise impact from fixed noise source. The respective noise environment should be documented in the EIA report.

2. Construction Noise Impact Assessment

2.1 Construction Noise Impact Assessment Methodology

- 2.1.1 The Applicant shall carry out construction noise impact assessment (excluding percussive piling) of the Project during daytime, i.e. 7am to 7pm, on weekdays other than general holidays in accordance with methodology in paragraphs 5.3 and 5.4 of Annex 13 of the TM.
- 2.1.2 For ground-borne construction noise impact, the Applicant shall propose assessment methodology and computational model which shall be confirmed with the Director, with reference to Section 4.4.2 of the TM, prior to the commencement of the assessment. Site measurements at appropriate locations may be required in order to obtain the empirical input parameters required in the computational model.

2.2 Identification of Construction Noise Impact

2.2.1 Identification of Assessment Area and Noise Sensitive Receivers

- (a) The Applicant shall propose the assessment area for agreement of the Director before commencing the assessment. The assessment area for the construction noise impact assessment shall generally include areas within 300 metres from the boundary of the Project and the works of the Project.
- (b) The Applicant shall identify all existing NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out

quantitative construction noise impact assessment described below.

- (c) The assessment points shall be confirmed with the Director prior to the commencement of the quantitative construction noise impact assessment and may be varied subject to the best and latest information available during the course of the EIA study.
- (d) A map showing the location and description such as name of building, use, and floor of each and every selected assessment point shall be given. Photographs of existing NSRs shall be appended to the EIA report.

2.2.2 Inventory of Noise Sources

The Applicant shall identify and quantify an inventory of noise sources for representative construction equipment for the purpose of construction noise impact assessment.

2.3 Prediction and Evaluation of Construction Noise Impact

2.3.1 Phases of Construction

The Applicant shall identify representative phases of construction that would have noticeable varying construction noise emissions at existing NSRs at the assessment area for agreement of the Director before commencing the construction noise impact assessment.

2.3.2 Scenarios

The Applicant shall quantitatively assess the construction noise impact, with respect to criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at different phases of construction of the Project.

2.3.3 Prediction of Noise Impact

- (a) The Applicant shall present the predicted noise levels in Leq (30 min) dB(A) at the selected assessment points at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative construction noise impact resulting from the construction works of the Project and other concurrent projects identified during the course of the EIA study on existing NSRs within the assessment area.

- (c) The potential construction noise impact under different phases of construction shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impact exceeding the criteria set in Annex 5 in the TM.
- (d) The Applicant shall, as far as practicable, formulate a reasonable construction programme so that no work will be required in restricted hours as defined under the Noise Control Ordinance (NCO). In case the Applicant needs to evaluate whether construction works in restricted hours as defined under the NCO are feasible or not in the context of programming construction works, reference should be made to relevant technical memoranda issued under the NCO. Regardless of the results of construction noise impact assessment for restricted hours, the Noise Control Authority will process Construction Noise Permit (CNP) application, if necessary, based on the NCO, the relevant technical memoranda issued under the NCO, and the contemporary conditions/situations. This aspect should be explicitly stated in the noise chapter and the conclusions and recommendations chapter in EIA report.

2.4 Mitigation of Construction Noise Impact

Direct Mitigation Measures

Where the predicted construction noise impact exceeds the criteria set in Table 1B of Annex 5, TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to, movable barriers, enclosures, quieter alternative methods, re-scheduling, restricting hours of operation of noisy tasks, etc. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be assessed. Any direct mitigation measures recommended should be well documented in the report. Specific reasons for not adopting certain direct mitigation measures to reduce the noise to a level meeting the criteria in the TM or to maximize the protection for the NSRs as far as possible should be clearly substantiated and documented in the EIA report.

2.5 Evaluation of Residual Construction Noise Impact

Upon exhaust of direct mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of TM, the Applicant shall identify, predict, evaluate the residual construction noise impact in accordance with Section 4.4.3 of the TM and estimate the total number of existing dwellings, classrooms and other noise sensitive elements that will be exposed to residual noise impact exceeding the criteria set in

Annex 5 in the TM.

3. **Road Traffic Noise Impact Assessment**

3.1 **Road Traffic Noise Impact Assessment Methodology**

3.1.1 The Applicant shall carry out road traffic noise impact assessment in respect of each road section (within the meaning of Items A.1, A.7 and A.8 under Part I, Schedule 2 of the EIAO and other road sections) and the noise levels from combined road sections of the Project at the NSRs in accordance with methodology in paragraphs 5.1 of Annex 13 of the TM.

3.1.2 **Input Data of Computational Model**

The Applicant shall provide the input data set of the road traffic noise computational model adopted in the assessment for various scenarios. The data shall be in electronic text file (ASCII format) containing road segments, barriers and noise sensitive receivers information. CD-ROM(s) containing the above data shall be submitted together with the EIA report.

3.2 **Identification of Road Traffic Noise Impact**

3.2.1 **Identification of Assessment Area and Noise Sensitive Receivers**

- (a) The Applicant shall propose the assessment area for agreement of the Director before commencing the assessment. The assessment area for the road traffic noise impact shall generally include areas within 300 metres from the boundary of the Project and the works of the Project.
- (b) The Applicant shall identify all existing, committed and planned NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out quantitative road traffic noise impact assessment described below.
- (c) The assessment points shall be confirmed with the Director prior to the commencement of the quantitative road traffic noise impact assessment and may be varied subject to the best and latest information available during the course of the EIA study.
- (d) A map showing the location and description such as name of building, use,

and floor of each and every selected assessment point shall be given. Photographs of existing NSRs shall be appended to the EIA report.

- (e) For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant landuse and planning parameters and conditions to work out representative site layouts for road traffic noise impact assessment purpose. However, such parameters and conditions together with any constraints identified shall be confirmed with the relevant responsible parties including Planning Department and Lands Department.

3.2.2 Inventory of Noise Sources

- (a) The Applicant shall analyse the scope of the proposed road alignment(s) to identify road sections for the purpose of road traffic noise impact assessment. Road sections to be included in road traffic noise impact assessment shall be confirmed with the Director prior to the commencement of the assessment.
- (b) Validity of the traffic flow prediction of road sections for the purpose of road traffic noise impact assessment shall be confirmed with Transport Department and documented in the EIA report.

3.3 Prediction and Evaluation of Road Traffic Noise Impact

3.3.1 Scenarios

- (a) The Applicant shall quantitatively assess the road traffic noise impact of the Project, with respect to the criteria set in Annex 5, TM, of unmitigated scenario and mitigated scenario at assessment year. The assessment year shall be made reference to Section 5.1 in Annex 13 of the TM.
- (b) The Applicant shall provide the input data sets of traffic noise model prediction model adopted in the EIA study as requested by the Director for the following scenarios:
 - (i) Unmitigated scenario at assessment year;
 - (ii) Mitigated scenario at assessment year; and
 - (iii) Prevailing scenario for indirect mitigated measures eligibility assessment.

3.3.2 Prediction of Noise Impact

- (a) The Applicant shall present the predicted noise levels in L10 (1 hour) dB(A)

at the selected assessment points at various representative floor levels (in m P.D.) on tables and plans of suitable scale.

- (b) The assessment shall cover the cumulative road traffic noise impact resulting from the road traffic noise due to the Project and existing road network on existing, committed and planned NSRs within the assessment area.
- (c) The potential road traffic noise impact under different scenarios shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impact exceeding the criteria set in Annex 5 in the TM

3.4 Mitigation of Road Traffic Noise Impact

3.4.1 Direct Mitigation Measures

- (a) Where the predicted road traffic noise impact exceeds the criteria set in Annex 5, TM the Applicant shall consider and evaluate direct mitigation measures including but not limited to noise barrier/enclosure, etc. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be assessed. Any direct mitigation measures recommended should be well documented in the report. Specific reasons for not adopting certain direct mitigation measures to reduce the noise to a level meeting the criteria in the TM or to maximize the protection for the NSRs as far as possible should be clearly quantified and documented in the EIA report.
- (b) The total number of noise sensitive receivers that will be benefited from and be protected by the provision of direct mitigation measures should be provided. The total number of other noise sensitive receivers that will still be exposed to noise above the criteria with the implementation of all recommended direct mitigation measures shall be quantified.
- (c) For planned noise sensitive uses which will still be affected even with practicable direct mitigation measures in place, the Applicant shall propose, evaluate and confirm the practicability of additional direct mitigation measures within the planned noise sensitive uses and shall make recommendations on how these noise sensitive uses will be designed for the information of relevant parties.
- (d) The Applicant shall take into account agreed environmental requirements

/constraints identified in the EIA study to assess the development potential of concerned sites which shall be made known to the relevant parties.

3.4.2 Indirect Mitigation Measures

- (a) Upon exhaust of direct mitigation measures, where the predicted road traffic noise impact still exceeds the criteria set in Table 1A of Annex 5, TM, the Applicant shall consider indirect mitigation measures in the form of window insulation and air-conditioning and evaluate in accordance with Section 6.2 in Annex 13 of TM.
- (b) The Applicant shall identify and estimate the total number of existing dwellings, classrooms and other noise sensitive elements which may qualify for indirect mitigation measures, the associated costs and any implications for such implementation.
- (c) For the purpose of determining eligibility of the affected premises for indirect mitigation measures, reference shall be made to methodology accepted by the recognized national/international organization or methodologies adopted for Hong Kong projects having similar issues on proposing an assessment methodology for determining eligibility of the indirect mitigation measures which shall be confirmed with the Director with reference to Section 4.4.2 of the TM, prior to the commencement of the assessment.

3.5 Evaluation of Residual Road Traffic Noise Impact

Upon exhaust of direct and indirect mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of TM, the Applicant shall identify, predict and evaluate the residual road traffic noise impact in accordance with Section 4.4.3 of the TM and Section 6.2 in Annex 13 of the TM.

4. **Fixed Noise Sources Impact Assessment**

4.1 Fixed Noise Sources Impact Assessment Methodology

The Applicant shall carry out fixed noise sources impact assessment from the Project in accordance with methodology in paragraph 5.2 of Annex 13 of the TM.

4.2 Identification of Fixed Noise Sources Impact

4.2.1 Identification of Assessment Area and Noise Sensitive Receivers

- (a) The Applicant shall propose the assessment area for agreement of the Director before commencing the assessment. The assessment area for the fixed noise impact shall generally include areas within 300 metres from the boundary of the Project and the works of the Project.
- (b) The Applicant shall identify all existing, committed and planned NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out fixed noise sources impact assessment described below.
- (c) The assessment points shall be confirmed with the Director prior to the commencement of the quantitative fixed noise sources impact assessment and may be varied subject to the best and latest information available during the course of the EIA study.
- (d) A map showing the location and description such as name of building, use, and floor of each and every selected assessment point shall be given. Photographs of existing NSRs shall be appended to the EIA report.
- (e) For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant landuse and planning parameters and conditions to work out representative site layouts for fixed noise sources assessment purpose. However, such parameters and conditions together with any constraints identified shall be confirmed with the relevant responsible parties including Planning Department and Lands Department.

4.2.2 Inventory of Noise Sources

- (a) The Applicant shall identify and quantify an inventory of noise sources for fixed noise sources impact assessment. The inventory of noise sources shall include, but not limited to noise associated with any permanent and temporary industrial noise sources including pump room, generator room, transformer room, public transport facilities, ventilation system(s) of building(s) and/or tunnel(s), and electricity substation(s), etc.
- (b) The Applicant shall provide document or certificate, accepted by recognized national/international organization, for the sound power level of each type of fixed noise sources.
- (c) Validity of the inventory shall be confirmed with the relevant government

departments/authorities and documented in the EIA report.

4.3 Prediction and Evaluation of Fixed Noise Sources Impact

4.3.1 Scenarios

- (a) The Applicant shall quantitatively assess the fixed noise sources impact with respect to criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at assessment years of various operation modes including, but not limited to,
 - (ii) the worst operation mode which represents the maximum noise emission in connection of identified noise sources of the Project; and
 - (iii) any other operation modes as confirmed with the Director.
- (b) Validity of the above operational modes shall be confirmed with relevant departments/authorities and documented in the EIA report.

4.3.2 Prediction of Noise Impact

- (a) The Applicant shall present the predicted noise levels in Leq (30 min) at the selected assessment points at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative fixed noise sources impact associated with the operation of the Project on existing, committed and planned NSRs within the assessment area.
- (c) The potential fixed noise sources impact under different scenarios shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impact exceeding the criteria set in Annex 5 in the TM.

4.4 Mitigation of Fixed Noise Sources Impact

4.4.1 Direct Mitigation Measures

Where the predicted fixed noise sources impact exceeds the criteria set in Table 1A of Annex 5, TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to noise barrier/enclosure, screening by noise tolerant buildings, etc. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be assessed. Any direct mitigation measures recommended should be well documented in the report. Specific reasons for not

adopting certain direct mitigation measures to reduce the noise to a level meeting the criteria in the TM or to maximize the protection for the NSRs as far as possible should be clearly substantiated and documented in the EIA report.

4.5 Evaluation of Residual Fixed Noise Sources Impact

4.5.1 Upon exhaust of direct mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of TM, the Applicant shall identify, predict, evaluate the residual fixed noise sources impact in accordance with Section 4.4.3 of the TM and estimate the total number of existing dwellings, classrooms and other noise sensitive elements that will be exposed to residual noise impact exceeding the criteria set in Annex 5 in the TM.

5. Helicopter Noise Assessment

5.1 Helicopter Noise Impact Assessment Methodology

The Applicant shall propose methodology and computational model for agreement of the Director, with reference to Section 4.4.2 of the TM, prior to the commencement of the assessment.

5.2 Identification of Helicopter Noise Impact

5.2.1 Identification of Assessment Area and Noise Sensitive Receivers

- (a) The Applicant shall propose the assessment area for agreement of the Director before commencing the assessment. The assessment area for helicopter noise impact shall include area of existing, committed and planned NSRs under or near to the helicopter flight tracks in vicinity of the proposed helipad.
- (b) The Applicant shall identify all existing, committed and planned NSRs in the vicinity and on the Project in the assessment area.
- (c) For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant planning parameters to work out representative site layouts for helicopter noise assessment purpose. Such assumptions together with any constraints identified shall be agreed by the relevant responsible parties including Planning Department and Lands Department.

5.2.2 Inventory of Noise Sources

- (a) The Applicant shall identify and quantify an inventory of noise sources for helicopter noise impact assessment. The inventory of noise sources shall include, but not limited to, helicopter noise characteristics (such as data representing noise emission and performance etc.) for all potential helicopter operating at the existing and planned helicopter pad(s). The information of the helicopter noise characteristics shall be referred to a database accepted by recognized national/international organization, as agreed by the Director.
- (b) Validity of the above data shall be confirmed with relevant government departments/authorities and documented in the EIA report.

5.3 Prediction and Evaluation of Helicopter Noise Impact

5.3.1 Scenarios

- (a) The Applicant shall quantitatively assess the helicopter noise impact from the operation of the helipads and related off site facilities (if any) during helicopters approaching and departure, with respect to the criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at assessment years of various operation modes including, but not limited to, (i) the worst operation mode which represents the maximum noise emission in connection of helicopter types, flight paths, flight frequency and flight hours, and; (ii) any other operation modes as agreed by the Director.
- (b) Validity of the above operation modes shall be confirmed with relevant government departments/authorities and documented in the EIA report.

5.3.2 Prediction of Noise Impact

- (a) The Applicant shall present the predicted helicopter noise impact in contours, with reference to criteria set in Annex 5 of the TM, including contours for each scenario assessed under various operation modes, on plans of suitable scale and documented in the EIA report. To determine the extent of the impact, the Applicant shall provide maps at an adequately detailed scale (not less than 1:5000) to show the contours.
- (b) The assessment shall cover the cumulative helicopter noise impact associated with the operation of the helicopter pads and related off site facilities on existing, committed and planned NSRs within assessment area.
- (c) The potential helicopter noise impact under different scenarios and operation

modes shall be quantified by estimating the total number of dwellings, classrooms and other noise sensitive receivers that will be exposed to noise impact exceeding the criteria set in Annex 5 in the TM.

5.4 Mitigation of Helicopter Noise Impact

5.4.1 Direct Mitigation Measures

Where the predicted helicopter noise impact exceeds the criteria set in Annex 5, TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to noise barrier/enclosure, screening by noise tolerant buildings, etc. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be assessed. Any direct mitigation measures recommended should be well documented in the report. Specific reasons for not adopting certain direct mitigation measures to reduce the noise to a level meeting the criteria in the TM or to maximize the protection for the NSRs as far as possible should be clearly substantiated and documented in the EIA report.

5.5 Evaluation of Residual Helicopter Noise Impact

Upon exhaust of direct mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of TM, the Applicant shall identify, predict and evaluate the residual helicopter noise impact in accordance with Section 4.4.3 of the TM and estimate the total number of existing dwellings, classrooms and other noise sensitive elements that will be exposed to residual noise impact exceeding the criteria set in Annex 5 of the TM.

Appendix D**Requirements for Water Quality Impact Assessment**

1. The Applicant shall identify and analyse physical, chemical and biological disruptions of the water system(s) arising from the construction and operation of the Project.
2. The Applicant shall predict and assess any water quality impacts arising from the construction and operation of the Project.
3. The Applicant shall address water quality impacts due to the construction phase and operational phase of the Project. Essentially, the assessment shall address the following :
 - (i) collect and review background information on affected existing and planned water systems, their respective catchments and sensitive receivers which might be affected by the Project;
 - (ii) characterize water quality of the water systems and sensitive receivers, which might be affected by the Project based on existing best available information or through appropriate site survey and tests;
 - (iii) identify and analyse relevant existing and planned future activities, beneficial uses and water sensitive receivers related to the affected water system(s). The Applicant should refer to, *inter alia*, those developments and uses earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans, and any other relevant published landuse plans;
 - (iv) identify pertinent water quality objectives and establish other appropriate water quality criteria or standards for the water system(s) and the sensitive receivers identified in (i), (ii) & (iii) above;
 - (v) review the specific construction methods and configurations, and operation of the Project to identify and predict the likely water quality impacts arising from the Project;

- (vi) identify any alternation of any water courses, natural streams, ponds, wetlands, change of catchment types or areas, erosion or sedimentation due to the Project;
- (vii) identify and quantify existing and likely future water pollution sources, including point discharges and non-point sources to surface water runoff, sewage from workforce and polluted discharge generated from the Project;
- (viii) evaluate the adequacy of the existing sewerage and sewage treatment facilities for the handling, treatment and disposal of wastewater arising from the Project as required in Section 3.4.5. Identify and quantify the water quality impacts based on the findings and recommendations from the Sewerage and Sewage Treatment Implications Assessment under Section 3.4.5. The water quality concerns shall include, but not limited to, possible sewage overflow or emergency discharge due to capacity constraints of the sewerage system, and emergencies arising from the Project;
- (ix) provide an emission inventory on the quantities and characteristics of those existing and future pollution sources in the study area. Field investigation and laboratory test, shall be conducted as appropriate to fill relevant information gaps;
- (x) predict and quantify the impacts on the water system(s) and its/their sensitive receivers due to those alternations and changes identified in (vi) above, and the pollution sources identified in (vii) above. The prediction shall take into account and include possible different construction and operation stages of the Project;
- (xi) assess the cumulative impacts due to other related concurrent and planned projects, activities or pollution sources within the study area that may have a bearing on the environmental acceptability of the Project;
- (xii) analyze the provision and adequacy of existing and planned future facilities to reduce pollution arising from the point and non-point sources identified in (vii) above. Effluent generated from the Project shall require appropriate collection, treatment and disposal to ensure that there is no net increase in pollution load to Deep Bay;

- (xiii) develop effective infrastructure upgrading or provision, contingency plan, water pollution prevention and mitigation measures to be implemented during construction and operation stages, so as to reduce the water quality impacts to within standards. Effluent generated from the Project shall require appropriate collection, treatment and disposal to ensure that there is no net increase in pollution load to Deep Bay. Requirements to be incorporated in the Project implementation contract document shall also be proposed;

- (xiv) investigate and develop best management practices to reduce storm water and non-point source pollution as appropriate; and

- (xv) evaluate and quantify residual impacts on water system(s) and the sensitive receivers with regard to the appropriate water quality objectives, criteria, standards or guidelines.

Appendix ERequirements for Assessment of Sewerage and Sewage Treatment Implications

1. The Applicant shall estimate the wastewater arising from the Project in the short, medium and long terms, assess the impacts of discharging wastewater to the receiving water and environment, propose measures to mitigate the impacts and demonstrate the acceptability of the residual impacts with timely implementation of the mitigation measures. The assessment shall include, inter alia, the followings:
 - (i) delineation of the wastewater catchment;
 - (ii) estimate the peak wastewater arising from the residential and non-residential discharges, with flow build-up, within the catchment up to an ultimate development year agreed by the Authority;
 - (iii) the proposed development falls on an unsewered area. The Applicant needs to provide proper treatment and disposal of the sewage arising associated with the development;
 - (iv) identify and quantify the water quality and ecological impacts due to the emergency discharge from on-site sewage treatment plant/pumping stations, if any, and sewer bursting discharge, and to propose measures to mitigate these impacts;
 - (v) estimate the quantity of screenings and sludge arising from the operation of the sewage treatment works, propose the disposal arrangement which shall be agreed by the Waste Disposal Authority; and
 - (vi) demonstrate the acceptability of the residual impacts with the timely commissioning of the mitigation measures.

Requirements for Assessment of Waste Management Implications and Land Contamination

The assessment of waste management implications and land contamination shall cover the following:

1. Analysis of Activities and Waste Generation

- (i) The Applicant shall identify the quantity, quality and timing of the wastes arising as a result of the construction and operation activities of the Project based on the sequence and duration of these activities, e.g. any dredged/excavated sediment/mud, construction and demolition materials and other wastes which will be generated during construction and operation stages.
- (ii) The Applicant shall adopt appropriate design, general layout, construction methods and programme to minimize the generation of public fill/inert construction and demolition (C&D) materials and maximize the use of public fill/inert C&D materials for other construction works.

2. Proposal for Waste Management

- (i) Prior to considering the disposal options for various types of wastes, opportunities for reducing waste generation, on-site or off-site re-use and recycling shall be fully evaluated. Measures that can be taken in the planning and design stages e.g. by modifying the design approach and in the construction stage for maximizing waste reduction shall be separately considered;
- (ii) After considering the opportunities for reducing waste generation and maximizing re-use, the types and quantities of the wastes required to be disposed of as a consequence shall be estimated and the disposal methods/options for each type of wastes shall be described in detail. The disposal methods/options recommended for each type of wastes shall take into account the result of the assessment in Section 2 (iv) below;
- (iii) The EIA report shall also state clearly the transportation routings and the frequency of the trucks/vessels involved, any barging point or conveyor

system to be used, the stockpiling areas and the disposal outlets for the wastes identified; and

- (iv) The impact caused by handling (including stockpiling, labelling, packaging & storage), collection, transportation and re-use/disposal of wastes shall be addressed in detail and appropriate mitigation measures shall be proposed. This assessment shall cover the following areas:
- potential hazard;
 - air and odour emissions;
 - noise;
 - wastewater discharge; and
 - public transport.

3. Excavation/Dredging and Dumping

- (i) The Applicant shall identify and quantify all excavation/dredging, excavated/dredged sediment/mud transportation and disposal activities and requirements. Potential dumping ground to be involved shall also be identified. Appropriate field investigation, sampling and chemical and biological laboratory tests to characterize the sediment/mud concerned shall be conducted. The ranges of parameters to be analyzed; the number, type and methods of sampling; sample preservation; chemical and biological laboratory test methods to be used shall be agreed with the Director (with reference to Section 4.4.2(c) of the TM) prior to the commencement of the tests and document in the EIA report for consideration. The categories of sediment/mud which are to be disposed of in accordance with a permit granted under the Dumping at Sea Ordinance (DASO) shall be identified by both chemical and biological tests and their quantities shall be estimated. If the presence of any serious contamination of sediment/mud which requires special treatment/disposal is confirmed, the Applicant shall identify the most appropriate treatment and/or disposal arrangement and demonstrate its feasibility. The Applicant shall provide supporting document, such as agreement by the relevant facilities management authorities, to demonstrate the viability of any treatment/disposal plan.
- (ii) The Applicant shall identify and evaluate the best practical excavation/dredging methods to minimize dredging/excavation and dumping requirements based on the criterion that existing sediment/mud shall be left in place and not to be disturbed as far as possible.

(4) Land Contamination

- (i) The Applicant shall identify all land lots and sites within the Project boundary of the Project (Appendix A refers) which, due to their past or present land uses, are potentially contaminated sites. A detailed account of the present activities and past land use history in relation to possible land contamination shall be provided.
- (ii) The list of potential contaminants which are anticipated to be found in these potentially contaminated sites shall be provided and possible remediation options shall be discussed.

Appendix G**Requirements for Ecological Impact Assessment (Terrestrial and Aquatic)**

1. In the ecological impact assessment, the Applicant shall examine the flora, fauna and other components of the ecological habitats within the assessment area. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the Project shall avoid or minimize impacts on recognized sites of conservation importance and other ecologically sensitive areas such as the Shenzhen River. The assessment shall identify and quantify as far as possible the potential ecological impacts to the natural environment and the associated wildlife groups and habitats/species arising from the Project including its construction and operation phases as well as the subsequent management and maintenance of the proposals.
2. The assessment shall include the followings:
 - (i) Review of the findings of relevant studies/surveys and collection of the available information regarding the ecological characters of the assessment area;
 - (ii) Evaluation of information collected and identification of any information gap relating to the assessment of potential ecological impact, and determine the ecological field surveys and investigations that are needed for an impact assessment as required in the following sections;
 - (iii) Carrying out necessary field surveys with a duration of at least four months, and investigation to verify the information collected, fill the information gaps as identified in (ii) above, and to fulfill the objectives of the EIA study. The field surveys shall cover but not be limited to flora, fauna and any other habitats/species of conservation importance,
 - (iv) Establishment of the general ecological profile of the assessment area based on information collected in the tasks mentioned in sub-section (i) to (iii) above, and describe the characteristics of each habitat found, the data set should be comprehensive and representative covering the variations of the wet and dry seasons, and is up to date and valid for the purpose of this assessment. Major information to be provided shall include:
 - (a) description of the physical environment, including all recognized sites of conservation importance and other ecologically sensitive areas, and

- assessment of whether these sites/areas will be affected by the Project or not;
- (b) habitat maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats and species of conservation interest in the assessment area;
 - (c) ecological characteristics of each habitat type such as size, vegetation type, species present, dominant species found, species diversity and abundance, community structure, seasonal pattern, ecological value and inter-dependence of the habitats and species, and presence of any features of ecological importance;
 - (d) representative colour photos of each habitat type and any important ecological features identified; and
 - (e) species found that are rare, endangered and/or listed under local legislation, international conventions for conservation of wildlife/habitats or Red Data Books.
- (v) Investigation and description of the existing wildlife uses of the various habitats with special attention to those wildlife groups and habitats with conservation interests, including but not limited to the following:
- (a) wetlands including wet agricultural land, seasonally wet grassland, marsh, fishponds, watercourses and associated riparian habitats;
 - (b) woodlands and plantations;
 - (c) vertebrates (e.g. avifauna, mammals, fish, herpetofauna);
 - (d) macroinvertebrates (e.g. butterflies, odonates, crustaceans,);
 - (e) wetland-dependent and woodland-dependent species; and
 - (f) any other habitats, animals and plants identified as having special conservation interest by this EIA study.
- (vi) Using suitable methodology and considering also other projects in the vicinity

of the Project area reasonably likely to occur at the same time, identification and quantification as far as possible of any direct, indirect, on-site, off-site, primary, secondary and cumulative ecological impacts, reduction of species abundance/diversity, loss of feeding grounds, nesting and/or breeding grounds, reduction of ecological carrying capacity, habitat fragmentation, and in particular the followings :

- (a) loss of habitats as mentioned in Section (v) above;
 - (b) disturbance to animal and plants, especially those as mentioned in Section (v)(c) – (f) above; and
 - (c) indirect ecological impacts due to potential changes in the water quality, hydrodynamics properties, sedimentation hydrology as a result of surface run-off, on habitats as mentioned in Section (v) above during the construction and operation stages of the Project.
-
- (vii) Evaluation of ecological impact based on the best and latest information available during the course of the EIA study, using quantitative approach as far as practicable and covering construction and operation phases of the Project as well as the subsequent management and maintenance requirement of the Project;
 - (viii) Recommendations for practicable mitigation measures to avoid, minimize and/or compensate for the adverse ecological impacts identified during construction and operation of the Project;
 - (ix) Evaluation of the feasibility and effectiveness of the recommended mitigation measures and define the scope, type, location, implementation arrangement, resources requirement, subsequent management and maintenance of such measures;
 - (x) Determination and quantification as far as possible of the residual ecological impacts after implementation of the proposed mitigation measures;
 - (xi) Evaluation of the significance and acceptability of the residual ecological impacts using well-defined criteria in Annex 8 of the TM and determine if off-site mitigation measures are necessary to mitigate the residual impacts and if affirmative, guidelines and requirements laid down in Annex 16 of the TM

should be followed; and

- (xii) Review the need for and recommendation on any ecological monitoring programme required.

Appendix H**Requirements for Landscape and Visual Impact Assessments**

1. The Applicant shall review relevant plan(s) and/or studies which may identify areas of high landscape value and recommend country park, coastal protection area, green belt and conservation area designations. Any guidelines on landscape and urban design strategies and frameworks that may affect the appreciation of the Project shall also be reviewed. The aim is to gain an insight to the future outlook of the area affected so as to assess whether the Project can fit into the surrounding setting. Any conflict with the statutory town plan(s) and any published land use plans shall be highlighted and appropriate follow-up action shall be recommended.
2. The Applicant shall carry out a baseline review on both the landscape and visual aspects of the study area. The Applicant shall describe, appraise, analyse and evaluate the existing and planned landscape resources and character of the assessment area. A system shall be derived for judging landscape and visual impact significance. Annotated oblique aerial photographs and plans of suitable scale showing the baseline landscape character areas and landscape resources and mapping of impact assessment shall be extensively used to present the findings of impact assessment. Descriptive text shall provide a concise and reasoned judgment from a landscape and visual point of view. The sensitivity of the landscape framework and its ability to accommodate change shall be particularly focused on. The Applicant shall identify the degree of compatibility of the Project with the existing and planned landscape setting, recreation and tourism related uses, and scenic spot. The landscape impact assessment shall quantify the potential landscape impact as far as possible so as to illustrate the significance of such impacts arising from the Project. Clear mapping of the landscape impact is required. Where applicable, broadbrush tree survey shall be carried out and the impacts on existing trees shall be addressed. Cumulative landscape and visual impacts of the Project with other committed and planned developments shall be assessed.
3. The Applicant shall assess the visual impacts of the Project. Clear illustration including mapping of visual impact is required. Descriptive text shall provide a concise and reasoned judgment from a visual point of view. Cumulative visual impact of the Project with other existing, committed and planned developments in the assessment area shall be assessed. The assessment shall include the following:

- (i) identification and plotting of visual envelope of the Project within the study area;
 - (ii) identification of the key groups of existing and planned sensitive receivers within the visual envelope with regard to views from ground level, sea level and elevated vantage points;
 - (iii) description of the visual compatibility of the Project with the surrounding and the existing and planned setting, and its obstruction and interference with the key views within the visual envelope; and;
 - (iv) the assessment shall take into account the factors affecting the sensitivity of receivers (including value and quality of existing views, availability and amenity of alternative views, type and estimated number of receiver population, duration of view and degree of visibility) and the magnitude of change of view (including compatibility of the Project with the surrounding landscape and planned setting, duration of impacts under construction and operation phases, scale of development, reversibility of change, viewing distance and potential blockage of view) for evaluating of visual impacts. The visual impacts of the Project with and without mitigation measures shall also be included so as to demonstrate the effectiveness of the proposed mitigation measures; and
 - (v) evaluations and explanations of factors considered in arriving the significance thresholds of visual impact.
4. The Applicant shall evaluate the merits of preservation in totality, in parts or total destruction of existing landscape and the establishment of a new landscape character area. In addition, alternative location, layout, design, built-form and construction method that will avoid or reduce the identified landscape and visual impacts shall be evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts. The mitigation measures proposed shall not only be concerned with damage reduction but shall also include consideration of potential enhancement of existing landscape and visual quality. The Applicant shall recommend mitigation measures to minimize adverse effects identified above, including provision of a master landscape plan.
5. The mitigation measures shall also include the preservation of vegetation and natural landscape resources, transplanting trees in good condition and value, provision of

screen planting, re-vegetation of disturbed lands, compensatory planting, woodland restoration, design of structure, provision of finishes to structure, colour scheme and texture of material used and any measures to mitigate the impact on the existing and planned land use and visually sensitive receivers. Parties shall be identified for the on going management and maintenance of the proposed mitigation works to ensure their effectiveness throughout the construction phase and operation phase of the Project. A practical programme for the implementation of the recommended measures shall be provided.

6. Annotated illustration materials such as colour perspective drawings, plans and section/elevation diagrams, annotated oblique aerial photographs, photographs taken at vantage points, and computer-generated photomontage shall be adopted to fully illustrate the landscape and visual impacts of the Project. The landscape and visual impacts of the Project with and without mitigation measures from representative viewpoints, particularly from views of the most severely affected visually sensitive receivers (i.e. worst case scenario), shall be properly illustrated in existing and planned setting at four stages (existing condition, Day 1 with no mitigation measures, Day 1 with mitigation measures and Year 10 with mitigation measures) by computer-generated photomontage so as to demonstrate the effectiveness of the proposed mitigation measures. Computer graphics shall be compatible with Microstation DGN file format. The Applicant shall record the technical details in preparing the illustration, which may need to be submitted for verification of the accuracy of the illustration.

Appendix I**Requirements for Hazard to Life Assessment****1. Impacts from nearby Potentially Hazardous Installation (PHI)**

The Applicant shall carry out hazard assessment to evaluate risks due to transport, storage and use of chlorine associated with the operations at Sheung Shui Water Treatment Works during the construction and operation of the Project. The hazard assessment shall include the following:

- (i) Identify hazardous scenarios associated with the transport, storage and use of chlorine and then determine a set of relevant scenarios to be included in a Quantitative Risk Assessment (QRA);
- (ii) Execute a QRA of the set of hazardous scenarios determined in (i), expressing population risks in both individual and societal terms;
- (iii) Compare individual and societal risks with the criteria for evaluating hazard to life stipulated in Annex 4 of the TM; and
- (iv) Identify and assess practicable and cost-effective risk mitigation measures.

2. Helicopter Fuel Refuelling and other Dangerous Goods (DGs)

If Helicopter Fuel Refuelling facilities and other dangerous goods (DGs) facilities are to be established in the Project site, the Applicant shall carry out hazard assessment as follows:

- (i) Identify hazardous scenarios associated with the transport, storage and use of helicopter fuel and other DGs and then determine a set of relevant scenarios to be included in a QRA;
- (ii) Execute a QRA of the set of hazardous scenarios determined in (i), expressing population risks in both individual and societal terms;
- (iii) Compare individual and societal risks with the criteria for evaluating hazard to life stipulated in Annex 4 of the TM; and
- (iv) Identify and assess practicable and cost-effective risk mitigation measures.

3. The hazard assessment shall also include a cumulative risk assessment of the Project, through interaction or in combination with other existing, committed and planned developments involving hazardous facilities in the vicinity of the Project (e.g. Organic Waste Treatment Facilities Phase 2).

4. The methodology to be used in the hazard assessment shall be agreed with the Director and be consistent with previous studies having similar issues (e.g. North East New Territories New Development Areas, Permanent Aviation Fuel Facility of Hong Kong International Airport, Organic Waste Treatment Facilities Phase 2).

Appendix J

Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures*	Objectives of the Recommended Measure & Main Concerns to address	Implementation Agent	Location/ Duration of the measure	Implementation stages* (Des, C O)	Relevant Legislation & Guidelines

* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project

** Des = Design, C = Construction, O + Operation

Requirements for EIA Report Documents

1. The Applicant shall supply the Director with the following number of copies of the EIA report and the executive summary:
 - (i) 30 copies of the EIA report and 30 copies of the bilingual (in both English and Chinese) executive summary as required under section 6(2) of the EIAO to be supplied at the time of application for approval of the EIA report.
 - (ii) When necessary, addendum to the EIA report and the executive summary submitted in item (i) above as required under section 7(1) of the EIAO, to be supplied upon advice by the Director for public inspection.
 - (iii) 20 copies of the EIA report and 50 copies of the bilingual (in both English and Chinese) executive summary with or without Addendum as required under section 7(5) of the EIAO, to be supplied upon advice by the Director for consultation with the Advisory Council on the Environment.
2. To facilitate public inspection of EIA report via EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA report and the executive summary prepared in HyperText Markup Language (HTML) (version 4.0 or later) and/or in Portable Document Format (PDF version 1.3 or later). A content page capable of providing hyperlink to each section and sub-section of the EIA report and the executive summary shall be included in the beginning of the document. Hyperlinks to figures, drawings and tables in the EIA report and the executive summary shall be provided in the main text from where respective references are made. Graphics in the report shall be in interlaced GIF format or in suitable formats accepted by the Director.
3. The electronic copies of the EIA report and the executive summary shall be submitted to the Director at the time of application for approval of the EIA report.
4. When the EIA report and the executive summary are made available for public inspection under section 7(1) of the EIAO, the content of the electronic copies of the EIA report and the executive summary must be the same as the hard copies and the Director shall be provided with the most updated electronic copies.
5. To promote environmentally friendly and efficient dissemination of information, both

hardcopies and electronic copies of future EM&A reports recommended by the EIA study shall be required.

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