Police Facilities in Kong Nga Po

Agreement No. CE31/2014 (CE) Engineering Study for Police Facilities in Kong Nga Po – Feasibility Study

Environmental Impact Assessment - Executive Summary

July 2016
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1 Introduction

This Executive Summary summarises the results of the Environmental Impact Assessment (EIA) for the Police Facilities in Kong Nga Po. The EIA accompanies an application for an Environmental Permit (EP) and has been prepared in accordance with the requirements of the Environmental Impact Assessment Ordinance (EIAO).

The “Land Use Planning for the Closed Area” completed in 2010 concluded with a series of suggestions, including further review the development potential of land released from the Closed Area including Kong Nga Po. To follow up on the suggestions, Civil Engineering and Development Department (CEDD) has earlier explored the feasibility of low-density residential development at Kong Nga Po. However, after considering the relevant planning, environmental and overall development factors, it was preliminarily concluded that the option of providing police training facilities at Kong Nga Po would be more desirable compared to the option of low-density residential development.

An engineering feasibility study was commissioned by CEDD under Agreement No. CE31/2014 (CE) to confirm the feasibility and environmental acceptability of co-locating police facilities in Kong Nga Po.

The project profile for the “Police Facilities in Kong Nga Po” was submitted to the Environmental Protection Department (EPD) on 23 July 2014 under Section 5(1)(a) of the EIAO. On 2 September 2014, EPD issued an EIA Study Brief for the Project (ESB-276/2014). The EIA report has been prepared according to the study brief requirements, which identified nine key environmental assessment aspects to be addressed as part of the EIA study. The findings of these assessments are described in Chapter 3 of this Executive Summary.
2 Project Description

2.1 Location and Scope of the Project

The proposed Project site locates in the North District roughly in midway between Sheung Shui / Fanling urban area and Shenzhen River, east of Man Kam To Road and north of Ng Tung river. The current site is a rural area with very limited existing developments. The main vehicular access to the Project site is the sub-standard rural track (Kong Nga Po Road) leading from Man Kam To Road.

The Project consists of site formation works and building works for the co-location of various police facilities in the Project site at Kong Nga Po as well as road improvement works to a section of the existing Kong Nga Po Road between the police facilities and Man Kam To Road. The police facilities include:

- Lo Wu Firing Range (LWFR) to be relocated from Lo Wu;
- Ma Tso Lung Firing Range (MTLFR) to be relocated from Ma Tso Lung;
- Weapons Training Facilities (WTF) to be relocated from Fan Garden;
- Police Driving and Traffic Training Facilities (PD&TTF ), including a multi-storey training complex, to be relocated from Fan Garden;
- Helipad to be relocated from Lo Wu;
- A Proposed Police Training Facility (PTF); and
- A new internal access road network with underpass (approx. 12m) within the Project site.

In addition to the police facilities to be co-located above, associated supporting infrastructure and utilities will also be provided, which include:

- An underground stormwater storage tank;
- A sewage pumping station (capacity approx. 150m³/day); and
- A petrol / diesel filling station (with vehicle washing area and vehicle charging area).

The improvement works to Kong Nga Po Road between the police facilities and Man Kam To Road includes roadworks, viaduct of less than 100m between abutments, and associated works such as slopeworks and retaining walls.

The Project layout is shown in Figure 2.1.

Based on the aforementioned scope, the Project covers the following Designated Projects (DPs) under the EIAO:

1. A helipad within 300m of existing or planned residential development (Item B.2, Part I, Schedule 2);

2.2 Consideration of Alternatives and Selection of Preferred Scenario

2.2.1 Project Layout

Following the preliminary layout and access arrangement developed for the Project under Agreement No. CE16/2012 – Engineering Feasibility Study for Kong Nga Po – Feasibility Study, three refinement options
were subsequently developed to explore the possibility in rearranging the facilities to fulfil all of the users’ requirements, while improving environmental performance. All three refinement options were found to be generally associated with less environmental impacts than the preliminary layout, with notable improvements in reducing the surplus excavated materials and potential visual impacts. After considering the environmental benefits and dis-benefits between the refinement options and taking into account the operational safety requirements of HKPF and GFS, Option 1 was selected as the preferred option to be taken forward. Subsequent modifications were made to the Project boundary as well as minor modifications to the internal layout to further improve the operational efficiency of the Project. Overall, the preferred option has minimised environmental impacts to the maximum practicable extent.

For the proposed access to the Project site, only the Kong Nga Po Road option was found to meet all technical and operational requirements, hence Kong Nga Po Road was selected as the preferred access option. Design of the road improvement works at Kong Nga Po Road has made the best use of the existing road alignment to minimise slopeworks and the number of trees affected.

### 2.2.2 Construction Method and Sequence

The major construction elements will broadly include:

- Site formation
- Foundation works
- Retaining walls and slope works
- General building and structure construction
- Improvement of existing Kong Nga Po Road

The construction activities associated with site formation and roadworks will include site clearance, excavation and filling, construction of access road, utilities laying and landscaping works. Well established conventional construction methods will be adopted for these works.

For the retaining structures, gravity walls and reinforced concrete (RC) L-shape walls and pile retaining walls were considered. Noting that gravity walls would require more materials and taking into account the topographical constraints, L-shape and pile retaining walls were identified as the preferred methods. Improvement works such as soil nailing, slope re-compaction and re-grading of slope gradient are envisaged as part of the slope works to improve ground stability.

For the proposed building facilities which are expected to be one to five storeys high, shallow foundation (i.e., strip or pad footings) will be adopted. In case where multi-storey buildings requiring large loading capacity, three piling options were considered, including large diameter bored piles, pre-bored socket H-piles and driven steel H-piles. Of the three options, pre-bored socket H-piles were evaluated as being best able to meet engineering requirements while minimising environmental impacts. Other construction activities for building facilities will not present significant differences in environmental impacts, hence conventional methods will be adopted.
Consideration was also given to the effect of construction programming on environmental impacts, including construction of the whole site at the same time versus phased construction of different ‘zones’ within the Project site. Taking into account the sensitivity of nearby sensitive receivers, the latter option has been adopted and the construction sequence has been optimised to avoid concurrent construction of particularly dusty and/or noisy activities within the same locations as far as practicable.

2.3 Implementation Programme

The design of the proposed project will commence in end-2016 / early 2017. The earliest site work is anticipated to commence in 2018 and complete by 2022.
3 Summary of Environmental Impact Assessment

3.1 Air Quality

3.1.1 Construction Phase

Potential air quality impacts from the construction works of the Project would mainly be related to construction dust from site formation, foundation works, excavation, and improvement works of existing Kong Nga Po Road. Dust generated from construction activities is the primary concern during the construction phase. Representative air sensitive receivers (ASRs) within the 500m from the Project boundary were identified for the construction phase assessment. Relevant modelling has been carried out to predict the hourly total suspended particulates (TSP), daily and annual respirable suspended particulates (RSP), and daily and annual fine suspended particulates (FSP) levels at the identified ASRs due to the dust-emitting construction activities for both scenarios of without and with the dust mitigation measures in place.

With implementation of the recommended mitigation measures as well as the relevant control requirements as stipulated in the Air Pollution Control (Construction Dust) Regulation, it has been predicted that the cumulative maximum hourly TSP, 10\textsuperscript{th} maximum daily RSP and 10\textsuperscript{th} maximum daily FSP concentrations at all the identified ASRs would be respectively not more than 341 µg/m\(^3\), 94 µg/m\(^3\) and 73 µg/m\(^3\). Therefore, it is anticipated that there would be no exceedance of the hourly TSP criterion (500 µg/m\(^3\)) as well as the Air Quality Objectives (AQOs) for daily RSP (100 µg/m\(^3\)) and daily FSP AQOs (75 µg/m\(^3\)).

For the annual RSP and annual FSP, the predicted cumulative concentrations would be respectively not more than 46 µg/m\(^3\) and 33 µg/m\(^3\) at any of the identified ASRs under the mitigated scenario, hence complying with the corresponding AQOs (50 µg/m\(^3\) for annual RSP and 35 µg/m\(^3\) for annual FSP).

3.1.2 Operation Phase

During the operation phase, the major sources of air pollution include vehicular emissions from existing open roads and the improved Kong Nga Po Road; and chimney emissions from Organic Waste Treatment Facility Phase 2 (OWTF2). Based on the air quality modelling results as summarized in Table 3.1, it is predicted that the cumulative nitrogen dioxide (NO\(_2\)), RSP and FSP concentrations at all identified ASRs would be compliant with the AQOs for hourly and annual NO\(_2\), daily and annual RSP, as well as daily and annual FSP.

<table>
<thead>
<tr>
<th>Air Pollutant</th>
<th>Averaging Time</th>
<th>AQO (µg/m(^3))</th>
<th>Allowable Exceedance in a year</th>
<th>Range of Concentrations (µg/m(^3))</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO(_2)</td>
<td>1 hour</td>
<td>200</td>
<td>18</td>
<td>115 - 133</td>
<td>10\textsuperscript{th} maximum values</td>
</tr>
<tr>
<td></td>
<td>1 year</td>
<td>40</td>
<td>0</td>
<td>18 - 25</td>
<td>Annual average</td>
</tr>
<tr>
<td>RSP</td>
<td>24 hours</td>
<td>100</td>
<td>9</td>
<td>84 - 88</td>
<td>10\textsuperscript{th} maximum values</td>
</tr>
</tbody>
</table>
Executive Summary

No significant operational phase air quality impact from the proposed helipad is expected. With implementation of the practical mitigation measures, impacts of dust, lead dust are anticipated to be localised within the firing ranges. Accumulation of air pollutants at the proposed firing ranges leading to exceedance of the relevant air quality criteria is therefore not anticipated. The findings from the odour patrol and test results obtained on two typical hot and dry sunny days show that the potential cumulative odour impacts at all ASRs due to the three existing pig farms, the existing San Uk Ling Firing Range, the proposed OWTF2 and the proposed firing ranges of the Project would be insignificant.

Hence, no adverse air quality impacts are anticipated during operation phase of the Project.

### 3.2 Noise Impact

#### 3.2.1 Introduction

Potential noise impacts associated with the construction and operation phases of the Project have been assessed in accordance with the technical requirements stipulated in Section 3.4.3 and Appendix C of the EIA study brief, as well as Annexes 5 and 13 of the EIAO-TM.

#### 3.2.2 Construction Noise

Quantitative assessment of the potential construction noise impact has been carried out in accordance with the EIA study brief requirements. The potential source of noise impact during the construction phase of the Project is from the use of powered mechanical equipment (PME) for various construction activities, including site formation, improvement of road network and building works for the training facilities, firing ranges and helipad etc. Concurrent projects have also been identified and incorporated into the assessment for cumulative impact.

The assessments were based on standard acoustic principles and the guidelines in the EPD Technical Memorandum on Noise from Construction Work other than Percussive Piling. Based on the tentative construction programme and PMEs anticipated to be used, the potential construction noise impact on representative NSRs was assessed.

Construction work for the underpass across the Kong Nga Po Road within the subject site is required for the Project. It is currently envisaged that this small-scale construction work will be carried out by cut and cover method (instead of drill and blast / bored tunnelling method). Therefore, no ground-borne noise impact is anticipated for this construction work.
The construction noise impact assessment has been conducted based on the best available information (taking into account other concurrent projects). With the implementation of the mitigation measures in form of quieter plant, movable barriers, noise enclosures and noise insulating fabric, the construction noise levels at all NSRs are predicted to comply with the noise standards stipulated in the EIAO-TM. Adverse construction noise impacts are therefore not anticipated in this project.

3.2.3 **Road Traffic Noise**

The potential road traffic noise impacts have been assessed based on the peak traffic flows in 2038. Traffic noise was predicted using the model “RoadNoise”, which has been used before in other similar EIA studies. The predicted road traffic noise levels at all representative NSRs would comply with the relevant noise criteria. Thus, no adverse road traffic noise impact is anticipated.

3.2.4 **Fixed Noise Sources**

The potential fixed noise sources during the operation phase include the operation of existing and planned firing ranges (i.e. the existing San Uk Ling Firing Range and the proposed reprovision of Lo Wu and Ma Tso Lung Firing Ranges); Proposed Police Training Facility (PTF); Weapon Training Facilities (WTF); Police Driving and Traffic Training Facilities (PD&TTF); ventilation openings; sewage pumping station and petrol / diesel filling station. Fixed noise sources have been assessed individually and cumulatively.

Noise impact from planned fixed noise sources could be effectively mitigated by implementing appropriate noise control measure at source during the detailed design stage. By installing at least 2.5m height perimeter wall / boundary wall at the Project site and 5m height 4-side walls at Ma Tso Lung firing range as well as the adoption of the maximum permissible SWLs for the proposed fixed plants (i.e. ventilation openings, sewage pumping station and petrol / diesel filling station), the impact noise levels at all representative NSRs complies with the relevant fixed noise criteria. Therefore, adverse fixed noise sources impact to the nearby NSRs is not anticipated.

3.2.5 **Helicopter Noise**

The helicopter noise impact assessment has been conducted based on the best available information. After adopting the design and operation measures as confirmed with GFS which includes treatment at source, restricting approach / taking-off flight paths and flight angles, and implementing at least 2.5m height perimeter wall / boundary wall at Project site, the predicted helicopter noise levels at all representative NSRs do not exceed the day-time helicopter noise standard laid down in Annex 5 of the EIAO-TM for both scheduled flight and emergency flight. The planned helipad at KNP from 7pm to 7am is for emergency use only and there will not be any scheduled flight during evening and night-time periods. The frequency of using the existing Lo Wu Range helicopter landing site from 7pm to 7am in Year 2010 – 2015 for emergency use is only 3 in total. The duration of each emergency use was about 7 minutes. The helicopter noise impact would comply with the relevant day-time noise criterion of $L_{\text{max}} 85 \text{ dB(A)}$ at all representative NSRs. No residual helicopter noise impact is anticipated.
3.3 Water Quality

The potential water quality impacts associated with the construction and operation phases of the Project have been assessed in accordance with the technical requirements stated in Section 3.4.4 and Appendix D of the EIA Study Brief, and Annexes 6 and 14 of the EIAO-TM.

Potential sources of construction-related water quality impacts include general construction activities related to storage of construction materials and release of construction debris; construction site runoff containing suspended solids, sediments and contaminants; spillage of chemicals; sewage from the construction workforce; and construction works in close proximity to inland watercourses. Operation phase water quality impacts include stormwater runoff from paved surfaces carrying suspended solids and other pollutants; accidental spillage of chemicals; runoff from the skid pan at the PD&TTF; sewage generated during operation phase; and risk of emergency discharge from the on-site sewage pumping station (SPS).

Mitigation measures have been recommended to ensure no adverse water quality impacts. These include (but are not limited to) adoption of good site practices outlined in ProPECC Note PN1/94 and ETWB TC (Works) No. 5/2005, appropriate storage of chemicals during construction phase, as well as design and maintenance of silt removal facilities as part of the future stormwater drainage system, fuel interceptors installed in the drainage system and provision of buffer capacity to minimise the risk of emergency discharge of sewage during operation phase. With these as well as other recommended mitigation measures in place, no adverse water quality impacts are expected during construction and operation phase.

3.4 Sewerage and Sewage Treatment

The sewerage and sewage treatment implications associated with the Project have been evaluated in accordance with the technical requirements stated in Section 3.4.5 and Appendix E of the EIA Study Brief.

The Project site is not currently served by a public sewerage connection, and the existing septic tank facility is not considered to be sufficient to accommodate the sewage flows generated by the Project, hence conveyance to the Shek Wu Hui Sewage Treatment Works (SWHSTW) is required. To convey Project-related sewage flows to SWHSTW, a new on-site SPS and sewer pipeline will be built and connected to the planned communal sewer with OWTF2, before discharging to existing sewerage facilities (PS3 and associated rising main) along Man Kam To Road.

Design of the new on-site SPS and sewer pipeline has taken into account the future population and estimated peak flows generated by the Project, and additional buffer capacity will be built into the on-site SPS to minimise the risk of emergency discharge of sewage during operation phase. The planned communal sewer will be implemented by either this Project or by OWTF2 project (subject to further liaison between CEDD and EPD during detailed design stage) and will be designed with adequate capacity to cater for the sewage flows from both this Project and the OWTF2 project.
Upgrades to the existing facilities (PS3 and associated rising main) downstream of the Project will be managed under a separate contract (CE1/2015(DS)) by DSD, with agreement that the upgrades will take into account the combined additional sewage flows generated by the Project and the OWTF2. The treatment capacity of SWHSTW will be increased under its Phase 1A expansion and will have sufficient treatment capacity for the Project-related sewage flows by the time of operation in 2022.

With implementation of the proposed new sewerage facilities and upgrades to existing facilities (by others), adverse sewerage impacts are not anticipated as a result of the Project.

### 3.5 Waste Management

Construction and demolition (C&D) materials will be generated from site clearance, site formation works, foundation works, retaining walls and slope works, building construction and superstructure works, and road improvement works. It is estimated that the total amount of C&D materials to be generated would be approximately 603,000 m$^3$, in which about 120,000 m$^3$ would be rock, and about 480,000 m$^3$ would be soil and the remaining 3,000 m$^3$ would be non-inert C&D materials.

It is estimated about 219,000 m$^3$ of inert C&D material would be reused on-site as fill materials. The remaining inert C&D materials could be reused by other projects in Hong Kong or to be disposed of at the government's Public Fill Reception Facilities (PFRFs) for beneficial use by any other projects in Hong Kong. With careful planning for reuse of C&D materials on-site and proper implementation of good construction site practice and mitigation measures recommended, potential dust, noise and water quality impacts associated with on-site handling and transportation of C&D materials are not anticipated.

Other waste materials including chemical waste from maintenance and servicing of construction plant and equipment and general refuse from the workforce will also be generated throughout construction. Provided that all these identified wastes are handled, transported and disposed of in strict accordance with the relevant legislative and recommended requirements and that the recommended good site practices and mitigation measures are properly implemented, no adverse environmental impact is expected during the construction phase.

During the operation phase, the key waste types generated will include general refuse from staff and trainees within Project; chemical waste from regular maintenance activities for some firing range structures and petrol and diesel filling activities for police vehicle fleet; as well as cartridge casings and bullet heads from firing and training activities. Provided that all these wastes are handled, transported and disposed of in strict accordance with the relevant legislative requirements and the recommended mitigation measures are properly implemented, no adverse environmental impact is expected during the operation phase.

Recommended mitigation measures for waste management are:

- Good site practices such as staff training in proper waste management and chemical handling procedures; providing sufficient waste disposal points; and employing licensed waste collectors.
- Waste reduction measures such as sorting demolition debris and excavated materials from demolition works to recover reusable/recyclable portions; and segregating and storing different types of waste in
different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.

- Following the DEVB Technical Circular (Works) No. 6/2010 for *Trip Ticket System for Disposal of Construction & Demolition Materials* to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping.
- Preparing and implementing a Waste Management Plan detailing various waste arising and waste management practices in accordance with the relevant requirements of the ETWB Technical Circular (Works) No. 19/2005 *Environmental Management on Construction Site*.

### 3.6 Land Contamination

The land contamination assessment has been conducted by reviewing the historical and current land uses, desktop appraisal and site reconnaissance survey with respect to the potential land contamination at the Study Area. Other relevant information collected from the related government departments has been reviewed.

Based on the findings of the desktop appraisal of the historical and current land uses and the site survey in the Study Area, land contamination impacts associated with the construction of the proposal project is not anticipated.

In case it is discovered contaminated materials after the commencement of works, mitigation measures for handling of contaminated materials and regular site audits are recommended to minimise the potential adverse impacts on workers’ health and safety and remediation/disposal of potentially contaminated materials.

During Operation Phase, the planned land uses within the Project will mainly include firing training, weapons training, driving and traffic training. All cartridge casing and bullet heads will be collected from the firing range after each target practice and stored in the storeroom for disposal. Therefore, no contaminated land issue is anticipated during training activities.

A petrol and diesel filling station will be provided in the Police Driving and Traffic Training Facilities (PD&TTF). Spills and leaks from underground storage tanks and pipework may pose the potential land contamination issues. With the recommended mitigation measures in place, no land contamination would be expected to arise and no adverse impacts are anticipated.

Mobile oil refuelling truck for refuelling of helicopters will be required under some specific operational need. The refuelling activities will be carried out at the helipad. With the recommended mitigation measures in place, no land contamination would be expected to arise and no adverse impacts are anticipated.

### 3.7 Ecology

The Project site comprises of five habitat types including plantation, grassland, grassland/shrubland, developed area and orchard. Amongst these habitat types, grassland is dominant in the Project site.
Although several flora and fauna species of conservation interest were recorded within the Project site, the area is generally not ecologically significant owing to the relatively low ecological value of the habitats. Grassland habitat is common in the Study Area and this habitat is also the dominant habitat at the periphery of the Project site. Therefore, the potential direct impact on habitat loss is considered as of moderate-minor to minor significance. Indirect impact on off-site habitat is also not considered to be significant due to lack of important ecological resources. No significant ecological impact will be resulted from the operation of the Project as all potential air quality, noise and water quality impacts will be controlled to environmentally acceptable levels, thus no specific ecological mitigation measure is considered necessary.

To minimise impact on the flora species of conservation interest within the Project site, it is recommended to conduct a detailed vegetation survey as baseline monitoring to update the exact locations, number and condition of individuals of any flora species of conservation interest within the proposed works area prior to the commencement of site clearance. Erection and maintenance of a temporary protective fence enclosing the flora species of conservation interest to be preserved is recommended to avoid potential impact from construction activities. A proper transplantation proposal should be prepared and implemented if individuals of flora species of conservation interest are identified not preserved on site. Monthly monitoring of any other flora species of conservation interest identified in the detailed vegetation survey should be conducted during the construction phase to preserve those flora species of conservation interest recorded within the Project site.

With consideration of minimizing impact on rare butterfly species of conservation interest recorded at the grassland in the Project site, it is recommended to consider inclusion of some common grass species which are the larval food plants of Small Three-ring and Swallowtail in the proposed vegetation planting or the Landscape Master Plan in order to benefit these species.

3.8 Landscape and Visual

The proposed development will see a complete change in the landscape of the Project site, transforming it from a rural albeit disturbed landscape into a large institutional facility. Many of the areas which surround the site are typical open storage and light industrial uses, however the future landscape context represented by the planning framework including OZPs and concurrent projects in the vicinity will be a much more developed setting. As such the proposed Kong Nga Po Police Facilities will be in-tune with this future setting.

Within the study area, 10 types of landscape resources, 13 nos. of landscape character areas, and 17 visually sensitive receivers (VSR) have been identified. Impacts before mitigation ranges from substantial adverse to insubstantial impact for landscape resources and character areas, and substantial adverse to insubstantial for VSRs. Mitigation measures are recommended to minimise impacts on the landscape within the landscape study area and the visual amenity of the visually sensitive receivers within the visual envelope.
The design of the site formation proposals have sought to be as sensitive as possible to the existing landscape setting. The landscape and visual mitigation proposals are centred on the use of extensive woodland planting around the periphery of the site for forming a landscape buffer. This buffer will screen low-level views (the majority of the existing VSRs are low-level) and integrate the proposals within the existing landscape framework in more elevated views.

Given the proposed design of the proposals, impacts on landscape resources during the design year (Year 10) will range from moderate adverse to slight beneficial; and for landscape character the impacts are largely slight adverse to insubstantial although there will be moderate adverse impacts on the Kong Nga Po Upland landscape. Although visual impacts range from moderate to slight adverse, it should be noted that the existing setting is of a rural nature, hence these views are only available to a relatively few people.

Overall, it is considered that the residual landscape and visual impacts of the proposed development are acceptable with mitigation during the construction and operation phases.

### 3.9 Hazard to Life

A quantitative risk assessment (QRA) has been conducted to determine the risk associated with (1) the storage, use and transport of chlorine at Sheung Shui Water Treatment Works, (2) other hazardous facilities in the vicinity, i.e. Organic Waste Treatment Facilities Phase 2; and (3) helicopter refuelling and other Dangerous Goods for the construction and operation stages of the proposed development.

The assessment has concluded that the risks are acceptable as per the individual and societal risk criteria set out in Annex 4 of the EIAO-TM. Therefore, implementation of further risk mitigation measures is not required. A list of recommendations / good practices were proposed to ensure the safe operation of the proposed police facilities.

### 3.10 Impact Summary

A summary of the environmental impacts for individual aspects in the EIA report is presented in Table 3.2.
### Table 3.2: Summary of Environmental Impacts

<table>
<thead>
<tr>
<th>Assessment Points</th>
<th>Result of Impact Prediction</th>
<th>Relevant Standards / Criteria</th>
<th>Extent of Exceedances Predicted</th>
<th>Impact Avoidance Measures Considered</th>
<th>Mitigation Measures Proposed</th>
<th>Residual Impacts after Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Quality Impact</strong></td>
<td></td>
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</tr>
<tr>
<td>Air Sensitive Receivers (ASRs) within 500 m study area and within the Project boundary.</td>
<td>Construction Phase</td>
<td>• Compliance with the AQO for hourly TSP, daily RSP and daily FSP under Tier 1 mitigated scenario, except 10th highest daily average RSP for ASR A9a.</td>
<td>Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) (Environmental Impact Assessment Ordinance (EIAO) (Cap. 499.151), EIAO-TM, Annexes 4 and 12; Air Pollution Control Ordinance (APCO) (Cap. 311); and Air Quality Objectives (AQO); and Air Pollution Control (Construction Dust) Regulation.</td>
<td>With the mitigation measures in place, the predicted cumulative hourly TSP, daily and annual RSP and daily and annual FSP levels at all ASRs would comply with the relevant hourly TSP criterion as well as the relevant AQO for daily and annual RSP and FSP.</td>
<td>N/A</td>
<td>Operation Phase</td>
</tr>
<tr>
<td><strong>Noise Impact</strong></td>
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<tr>
<td>Noise Sensitive Receivers within 300 m assessment area.</td>
<td>Construction Noise</td>
<td>With the implementation of the mitigation measures in form of quieter plant, movable barriers, noise enclosures and noise insulating fabric, the construction noise levels at all NSRs are predicted to comply with the noise standards stipulated in the EIAO-TM.</td>
<td>Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) (Environmental Impact Assessment Ordinance (EIAO) (Cap. 499.151), EIAO-TM, Annexes 4 and 12; and Air Pollution Control Ordinance (APCO) (Cap. 311) and the Air Quality Objectives (AQO).</td>
<td>With the avoidance and mitigation measures in place, no exceedance of the daytime construction noise criterion at any representative NSRs was predicted.</td>
<td>N/A</td>
<td>Operation Phase</td>
</tr>
<tr>
<td><strong>Road Traffic Noise</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>104m assessment area has been established against the criteria of L_{eq} = 85 dB(A) under several worst assumptions.</td>
<td>Road Traffic Noise</td>
<td>The predicted road traffic noise levels at all representative NSRs would comply with the relevant noise criteria. Thus, no adverse road traffic noise impact is anticipated.</td>
<td>Technical Memorandum on Noise from Construction Work other than Percussive Piling; and Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites.</td>
<td>No exceedance of the relevant road traffic noise criteria at any representative NSRs was predicted.</td>
<td>N/A</td>
<td>Operation Phase</td>
</tr>
<tr>
<td><strong>Fixed Noise Sources</strong></td>
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</tr>
<tr>
<td>694m assessment area has been established against the criteria of L_{eq} = 85 dB(A) under several worst assumptions.</td>
<td>Fixed Noise Sources</td>
<td>With the recommended avoidance and mitigation measures in place, the planned and cumulative mitigated noise levels due to fixed noise sources would comply with the relevant noise criteria at all representative NSRs.</td>
<td>Technical Memorandum on Noise from Construction Work other than Percussive Piling; and Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites.</td>
<td>With the avoidance and mitigation measures in place, no exceedance of the relevant fixed noise criteria at any representative NSRs was predicted.</td>
<td>N/A</td>
<td>Operation Phase</td>
</tr>
</tbody>
</table>

**Construction Phase**
- Use of regular water spraying (once every 1.25 hours or 8 times per day) to reduce dust emissions from heavy construction activities (including ground excavation, earth moving, etc.) at all active works area, exposed site surfaces and unpaved roads, particularly during dry weather.
- Covering 80% of stockpiling area by impervious sheets and spraying all dusty material with water immediately prior to any loading transfer operations to keep the dusty materials wet during material handling at the stockpile areas.
- Dust control practices as stipulated in the Air Pollution Control (Construction Dust) Regulation.

**Operation Phase**
- To minimize air quality impacts from the firing range of the project, the following control measures should be implemented as far as practicable:
  - Bullet containment systems.
  - Monitoring and adjusting of soil pH or runoff.
  - Use of lead-free primers mixture for firearms or air pistol.
  - Erect solid fence wall with at least 2.4m to 3.5m height.

**Residual Impacts**
- No residual impacts anticipated due to the project development during the construction phase.
- Operation Phase: Residual impact is not anticipated.
Agreement No. CE31/2014 (CE) Engineering Study for Police Facilities in Kong Nga Po – Feasibility Study

### Executive Summary

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</thead>
<tbody>
<tr>
<td>Helicopter Noise</td>
<td>By adopting the recommended avoidance and mitigation measures, the predicted helicopter noise levels at all representative NSRs would comply with the relevant noise criteria.</td>
<td>Annexes 6 and 14 of EIAR-TM; Water Pollution Control Ordinance (Cap. 358); Deep Bay WCZ Water Quality Objectives (WQO); Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters; “No Net Increase in Pollution Load” Requirement in Deep Bay; and Practice Note for Professional Persons on Construction Site Drainage.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Fixed Noise Sources</td>
<td>Specification of the maximum permissible SWLs of the Project’s fixed plants during daytime/evening and night-time should be followed.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Helicopter Noise</td>
<td>Only one helicopter will be allowed in hovering, approaching or taking-off while another helicopter should be idling on ground.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Water Quality Impact

**WSRs within 500m of the Project boundary, Deep Bay Water Control Zone (WCZ) and in the vicinity of the Project site**

- **Construction Phase**
  - No adverse water quality impacts are expected as a result of general construction activities.
  - No adverse water quality impacts anticipated as a result of site runoff.
  - No adverse water quality impacts are expected as a result of accidental spillage of chemicals.
  - No adverse water quality impacts are anticipated from sewage generated by the construction workforce; and
  - No adverse water quality impacts are predicted by construction works in close proximity to inland watercourses.

- **Operation Phase**
  - No adverse water quality impacts are expected as a result of stormwater runoff.
  - No adverse water quality impacts are expected as a result of accidental spillage of chemicals, oils and fuels.
  - No adverse water quality impacts are anticipated as a result of runoff generated by the Police Driving & Traffic Training Facilities (PD&TTF).
  - No adverse water quality impacts are anticipated as a result of treated sewage discharge to Deep Bay WCZ; and
  - No adverse water quality impacts are anticipated from emergency discharge from the proposed sewage pumping station (SPS).

**Sewerage and Sewage Treatment Implications**

**Study Area**

- **Construction Phase**
  - No adverse impacts are anticipated from conveyance of sewage generated by the Project to the SWHSTW.
  - No adverse impacts are anticipated from emergency discharge from the proposed on-site SPS.

- **Operation Phase**
Agreement No. CE31/2014 (CE) Engineering Study for Police Facilities in Kong Nga Po – Feasibility Study

Executive Summary

Result of Impact Prediction

Relevant Standards / Criteria

Extent of Exceedances Predicted

Impact Avoidance Measures Considered

Mitigation Measures Proposed

Residual Impacts after Mitigation

### Waste Management Implications

**Study Area**

- **Construction Phase**
  - Inert construction and demolition (C&D) materials of about 600,000m³ and non-inert C&D materials of about 3,000m³ will be generated from site formation; foundation, retaining walls and slope work, building construction and superstructure works as well as road improvement works;
  - General refuse of maximum daily arising of up to 260kg from construction workforce;
  - Small quantity of chemical waste from maintenance and servicing of construction plant and equipment.

- **Operation Phase**
  - About 170kg/day of general refuse will mainly be generated from training activities and restaurants;
  - Chemical waste from maintenance activities for some firing range structures and petrol and diesel filling activities for police vehicle fleet at PD&TTF; and
  - About 7,000kg of cartridge casings and bullet heads will be generated from firing and training activities per year.

**Annexes 7 and 15 of EIAO-TM**

- Waste Disposal Ordinance (Cap. 354);
- Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C);
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N);
- Public Cleansing and Prevention of Nuisances Regulation (Cap. 132RK); and
- Land (Miscellaneous Provisions) Ordinance (Cap. 28).

**Construction Phase**

- Minimise site excavation for site formation works and retaining structure and minimise the amount of excavated materials to be generated.

**Operation Phase**

- Good site practices and waste reduction measures for C&D materials;
- Handling of chemical wastes in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, and disposal of chemical wastes at licensed chemical waste recycling/treatment facilities; and
- Employ a reputable licensed waste collector for disposal of general refuse at designated landfill sites.

**Land Contamination**

**Study Area**

- The land contamination assessment has been conducted by reviewing the historical and current land uses, desktop appraisal and site reconnaissance survey with respect to the potential land contamination at the Study Area.
- Land contamination impacts associated with the construction of the proposal project is not anticipated

**Construction Phase**

- The design engineer should adhere to relevant design standards for storage tank and pipework;
- Regular inspections and maintenance should be performed;
- Underground fuel storage tank should be placed within a concrete pit;
- Refuelling service area should be concrete-paved;
- Spill control materials and equipment should be provided on site;
- If the fuel leakage or spillage occur during refuelling activities, the activities should be immediately stopped; and
- Fuel leakage or spillage should be contained and cleaned up immediately.

**Operation Phase**

- Employ a reputable licensed waste collector to collect general refuse on a daily basis and dispose of the general refuse at designated landfill sites;
- Handling of chemical wastes in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, and disposal of chemical wastes at licensed chemical waste recycling/treatment facilities; and
- Employ a designated waste contractor to collect cartridge casings and bullet heads regularly.

**Ecological Impact**

**Habitats, flora and fauna within 500m collar area and any other areas likely to be impacted by the Project**

- Moderate-minor impact for the loss of grassland habitat and disturbance to butterfly species of conservation interest;
- Minor impact for loss of other habitat and other impacts, including impact on flora species of conservation interest, disturbance impact on terrestrial fauna

**Annexes 8 and 16 of EI200-TM**


**Construction Phase**

- Establishment and maintenance of a temporary protective fence enclosing the flora species of conservation interest to be preserved to avoid potential impact from construction activities such as materials storage;
- A detailed vegetation survey of flora species of conservation interest as baseline monitoring within the proposed works area prior to the commencement of site clearance;
- A proper transplantation proposal

**Pre-Construction Phase**

- No residual impacts would be anticipated.
### Executive Summary

#### Assessment Points

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<td>Species of conservation interest and Man Kam To Egretary, off-site disturbance, reduction of ecological carrying capacity and indirect impact of surface runoff on aquatic ecology.</td>
<td></td>
<td></td>
<td>should be prepared and implemented if individuals of flora species of conservation interest are identified not preserved on site; to consider inclusion of larval food plants of butterfly species Small Three-ring and Swallowtail in the proposed vegetation planting; Construction Phase</td>
<td></td>
</tr>
<tr>
<td>Landscape Resources (LRs) and Landscape Character Areas (LCAs) within 500m Study Area and Visually Sensitive Receivers (VSRs) within the Visual Envelope</td>
<td></td>
<td></td>
<td>month monitoring of any other flora species of conservation interest identified in the detailed vegetation survey; implementation of good site practice during construction stage.</td>
<td></td>
</tr>
<tr>
<td>Impact on Hazard to Life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Risk due to transport, storage and use of chlorine associated with the operations at Sheung Shui Water Treatment Works</td>
<td>Annex 4 of EIAO TM</td>
<td>No exceedances anticipated.</td>
<td>Mitigation measures are not necessary due to the fact that the societal risk level is in the acceptable region. A list of good practices is recommended in the Operation Phase: All DG stores should be constructed according to the standards and recommendations by Fire Services Department,</td>
<td>No residual impacts are anticipated.</td>
</tr>
<tr>
<td>(2) Risk associated with helicopter refuelling and other operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Assessment Points

1. Dangerous Goods (DG) in the project site
   - (3) Cumulative risk assessment of the Project through interaction or in combination with Organic Waste Treatment Facilities Phase II

### Result of Impact Prediction

- Dangerous Goods (DG) in the project site
- (3) Cumulative risk assessment of the Project through interaction or in combination with Organic Waste Treatment Facilities Phase II

### Relevant Standards / Criteria

- Having adequate fire fighting facilities, proper ventilation and fire-proofing requirement.
- All DGs such as paints and solvents should be stored in their respective DG rooms.
- Adequate fire-fighting equipment, such as fire extinguishers, fire sand etc. should be present during kerosene refuelling operation on the helipad.
- Proper earthing equipment and procedures should be in place to prevent accumulation of static electricity during kerosene refuelling operation.
- GFS kerosene road tanker and the helicopter pilot should follow the established protocol for arriving at the helipad to prevent helicopter crashing on the road tanker.
- Refuelling will only be performed in daytime
- Underground storage tanks will be used for petrol/diesel storage
- Kerosene pump will be equipped with pressure switch to prevent overfilling

### Extent of Exceedances Predicted

### Impact Avoidance Measures Considered

### Mitigation Measures Proposed

### Residual Impacts after Mitigation
4 Environmental Monitoring and Audit

An environmental monitoring and audit (EM&A) programme to check the effectiveness of the recommended mitigation measures and compliance with relevant statutory requirements should be implemented. Details of the EM&A works are given in the separately prepared EM&A Manual for the Project. The EM&A Manual contains details of the proposed EM&A requirements, implementation schedule of the environmental protection / mitigation measures, EM&A reporting procedures and complaint handling procedures.
5 Conclusion

The EIA has identified and assessed the potential environmental impacts that may arise from the construction and operation of the Project in accordance with the guidelines of the EIAO-TM and the EIA Study Brief. Based on the results of the assessments, the EIA study concludes that with implementation of the recommended environmental mitigation measures, the Project would be environmentally acceptable and in compliance with environmental legislation and standards. A comprehensive environmental monitoring and audit programme should be implemented to check the implementation of mitigation measures and environmental compliance.
Figures