# 3 AIR QUALITY IMPACT ASSESSMENT

## 3.1 Introduction

3.1.1 It should be noted that the EIA Study Brief *ESB-091/2001* issued under the Environmental Impact Assessment Ordinance does not include a requirement for an Air Quality Impact Assessment, as use of the proposed helipad will be limited.

3.1.2 This section shall give a brief account of the potential for the construction dust generation and recommendations on the appropriate remedial actions to minimise any potential impacts. This will be done to ensure compliance with the Air Pollution Control (Construction Dust) Regulation and to ensure effective control of any potential dust impacts.

3.1.3 Emissions from helicopter will be short-lived and occur infrequently during the operation of the helipad due to its emergency nature of use. No potential operational phase dust impacts are anticipated.

## 3.2 Relevant Guidelines, Standards & Legislation

### *Air Pollution Control Ordinance (Cap. 311)*

3.2.1 The Air Pollution Control Ordinance (APCO) provides the statutory authority for controlling air pollutants from a variety of stationary and mobile sources, including fugitive dust emissions from construction sites. It encompasses Air Quality Objectives (AQOs) for 7 common air pollutants. The AQOs are given in *Table 3.1*.

***Table 3.1 Hong Kong Air Quality Objectives***

| Pollutant | Concentration ($\mu g/m^3$)(1) Averaging Time | | | | |
|---|---|---|---|---|---|
| | 1 Hour(2) | 8 Hour(3) | 24 Hours(3) | 3 Months(4) | 1 Year(4) |
| Sulphur Dioxide $SO_2$ | 800 | – | 350 | – | 80 |
| Total Suspended Particulates (TSP) | – | – | 260 | – | 80 |
| Respirable Suspended Particulates (RSP)(5) | – | – | 180 | – | 55 |
| Nitrogen Dioxide $NO_2$ | 300 | – | 150 | – | 80 |
| Carbon Monoxide CO | 30000 | 10000 | – | – | – |
| Photochemical Oxidants (as ozone(6)) | 240 | – | – | – | – |
| Lead | – | – | – | 1.5 | – |

*Notes:*
*(1) Measured at 298 K and 101.325 kPa (one atmosphere).*
*(2) Not to be exceeded more than three times per year.*
*(3) Not to be exceeded more than once per year.*
*(4) Arithmetic means.*
*(5) Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 micrometers or less.*
*(6) Photochemical oxidants are determined by measurement of ozone only.*

3.2.2 Section 1, Annex 4 of EIA-TM* stipulates the hourly average Total Suspended Particulate (TSP) concentration of 500 $\mu g/m^3$ measured at 298 K (25°C) and 101.325 kPa (1 atmosphere) for construction dust impacts. Mitigation measures for construction sites specified in the Air Pollution Control (Construction Dust) Regulation should be followed.

* Technical Memorandum on Environmental Impact Assessment Process (EIA-TM)

3.2.3 The APCO subsidiary regulation Air Pollution Control (Construction Dust) Regulation defines notifiable and regulatory works activities that are subject to construction dust control.

***Notifiable Works:***

(a) Site formation;
(b) Reclamation;
(c) Demolition of a building;
(d) Work carried out in any part of a tunnel that is within 100 m of any exit to the open air;
(e) Construction of the foundation of a building;
(f) Construction of the superstructure of a building; or
(g) Road construction work,

***Regulatory Works:***

(a) Renovation carried out on the outer surface of the external wall or the upper surface of the roof of a building;
(b) Road opening or resurfacing work;
(c) Slope stabilization work; or
(d) Any work involving any of the following activities:
- Stockpiling of dusty materials;
- Loading, unloading or transfer of dusty materials;
- Transfer of dusty materials using a belt conveyor system;
- Use of vehicles;
- Pneumatic or power-driven drilling, cutting and polishing;
- Debris handling;
- Excavation or earth moving;
- Concrete production;
- Site clearance; or
- Blasting.

3.2.4 Notifiable works require that advance notice of activities be given to EPD. The Regulation also requires the works contractor to ensure that both notifiable works and regulatory works will be conducted in accordance with the Schedule of the Regulation, which provides dust control and suppression measures.

## 3.3 Baseline Conditions and Air Sensitive Receivers

***Existing Environment***

3.3.1 The existing air quality in Peng Chau is generally rural. No major air polluting sources are located near Peng Chau. The nearest potential source is the Penny's Bay Gas Turbine Plant that is over 3.5km away, due north of Peng Chau. There are no major road networks within Peng Chau and therefore there are no vehicular emissions related air quality impacts.

3.3.2 Environmental Protection Department (EPD) operates a network of Air Quality Monitoring Stations in Hong Kong, but none of these monitoring stations is located within or near Peng Chau. As such, air quality data collected at the Tap Mun monitoring station in Sai Kung District – which resembles a rural area type setting similar to the environs of Peng Chau – has been selected as being broadly representative of the existing ambient air quality conditions at Peng Chau. These data are summarised in *Table 3.2.* [*]

[*] Environmental Protection Department Air Service Group, Air Quality in Hong Kong 2002, (2002), Table C3 and Table C4.

***Table 3.2 Annual Average Pollution Concentrations Recorded in Tap Mun (Year 2002)***

| Pollutants Monitored | Annual Average in micrograms per cubic metre |
|---|---|
| Respirable Suspended Particulates (RSP) | 39 |
| Sulphur Dioxide ($SO_2$) | 11 |
| Nitrogen Dioxide ($NO_2$) | 13 |
| Carbon Monoxide (CO) | 688 |
| Ozone ($O_3$) | 63 |

*Notes:*
1. *All concentrations are measured at 298K (25°C) and 101.325KPa (one atmosphere)*
2. *Data of the Tap Mun Monitoring Station are extracted from "Air Quality in Hong Kong 2002", published by EPD*

### *Future Conditions*

3.3.3 Based on current information, the Drainage Services Department's (DSD) project Peng Chau Sewage Treatment Works (STW) Upgrade at Tai Lei Island will commence in mid 2005. This STW upgrading work will be a potential fugitive dust source during the works phase. There may be other construction works to be carried out on the reclaimed area that may be a source of fugitive dust. However, these will only be a short-term change in the ambient condition locally and will not alter the nature of the air quality condition of Peng Chau once the works are completed.

3.3.4 Based on the helicopter flight paths advised by GFS, helicopters will not over-fly the Phase 1 Reclamation area and the distance of the sand depot from the helipad would be too far for any dust (wind-blown sand) impacts to be generated. As such, no adverse air quality (dust) impacts are anticipated from Project operation. There are no distributor roads or other major infrastructure development planned in Peng Chau and therefore, the air quality conditions are not expected to have any significant change in the future.

### *Air Sensitive Uses*

3.3.5 Sea Crest Villa, a low-rise (3-storey high) residential development, is located at the junction of Peng Lei Road and the future helipad EVA link. This is the closest domestic air sensitive receiver to the proposed works. There are no domestic premises in the immediate environs of the helipad site. Another existing domestic air sensitive use is Kam Peng Estate that is located about 200 metres south east of Sea Crest Villa. *Figure 3.1* displays the locations of Sea Crest Villa and Kam Peng Estate.

## 3.4 Construction Dust Impact Assessment

### *Identification of Impacts*

3.4.1 If uncontrolled, construction activities dust may result in construction dust impacts. Construction of the helipad and the associated EVA using reclamation method will include dust generation activities, some of which are notifiable / regulatory works. They are described below.

3.4.2 The construction will begin with site clearance, including breaking of existing ground near the north of Sea Crest Villa. This will be a regulatory works procedure that requires appropriate dust suppression measures under the Regulation to adequately control dust to within an acceptable level.

3.4.3 Erection of site office will be required at the off-site works area (approximately 800 $m^2$), which is located immediately south of Sea Crest Villa. Development of the off-site works area will not involve any dust-generating activities. However, the erection of hoarding and fencing at the works area may involve very minor excavation that comprises a regulatory works procedure, and for which dust control measures will be implemented. Dusty material stockpiling and handling will only be conducted in the

works area and measures shall be implemented to ensure dust levels are controlled to within an acceptable level.

3.4.4 Reclamation includes dredging and placement of rocks / rubble, is a notifiable work and is controlled by the Regulation. The dredged materials will have a high moisture content that is unlikely to result in dust emissions. The fill materials will be directly placed into the water from barge and no fugitive dust impacts are anticipated.

3.4.5 The construction of the helipad and EVA may result in minor wind blown dust impacts. However, this activity is a regulatory works procedure and requires proper suppression measures to control dust to within an acceptable level.

3.4.6 There may be use of trucks for material transport from the off-site works area to the works area via the existing concrete paved EVA. Use of vehicles is a regulatory work procedure and the required dust control measures shall ensure dust levels are controlled to an acceptable level.

***Cumulative Impacts***

3.4.7 Based on the tentative construction schedule of the Drainage Services Department's project Peng Chau Sewage Treatment Works (STW) Upgrade at Tai Lei Island that would commence construction in mid 2005, it would be a cumulative source of dust impacts. However, dust control measures will be implemented during the helipad construction of which the scale of work is relatively limited. Furthermore, the DSD's project also will have to implement dust control measures during their construction phase. As a result, no significant cumulative dust impacts are anticipated.

***Evaluation of Potential Impacts***

3.4.8 In view of the small scale of works, construction dust impacts can be controlled with appropriate implementation of dust suppression measures. Moreover, dust control and suppression measures are statutory requirements under the Air Pollution Control (Construction Dust) Regulation. As such, fugitive dust impacts during the construction can be adequately controlled and no significant impacts are anticipated.

## 3.5 Mitigation Measures

3.5.1 All applicable dust control measures as recommended in the Air Pollution Control (Construction Dust) Regulation should be implemented. Typical dust control measures include:

- The working area for site clearance adjacent to Sea Crest Villa shall be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet.
- Restricting heights from which materials are dropped, as far as practicable to minimise the fugitive dust arising from unloading/loading.
- For reclamation works, if a stockpile of dusty materials is more than 1.2 m high and within 50m of Peng Lei Road or the Pak Wan footpath, the stockpile shall be properly treated and sealed with latex, vinyl, bitumen or other suitable surface stabilizer.
- Immediately before leaving a construction site, every vehicle shall be washed to remove any dusty materials from its body and wheels.
- All spraying of materials and surfaces should avoid excessive water usage.

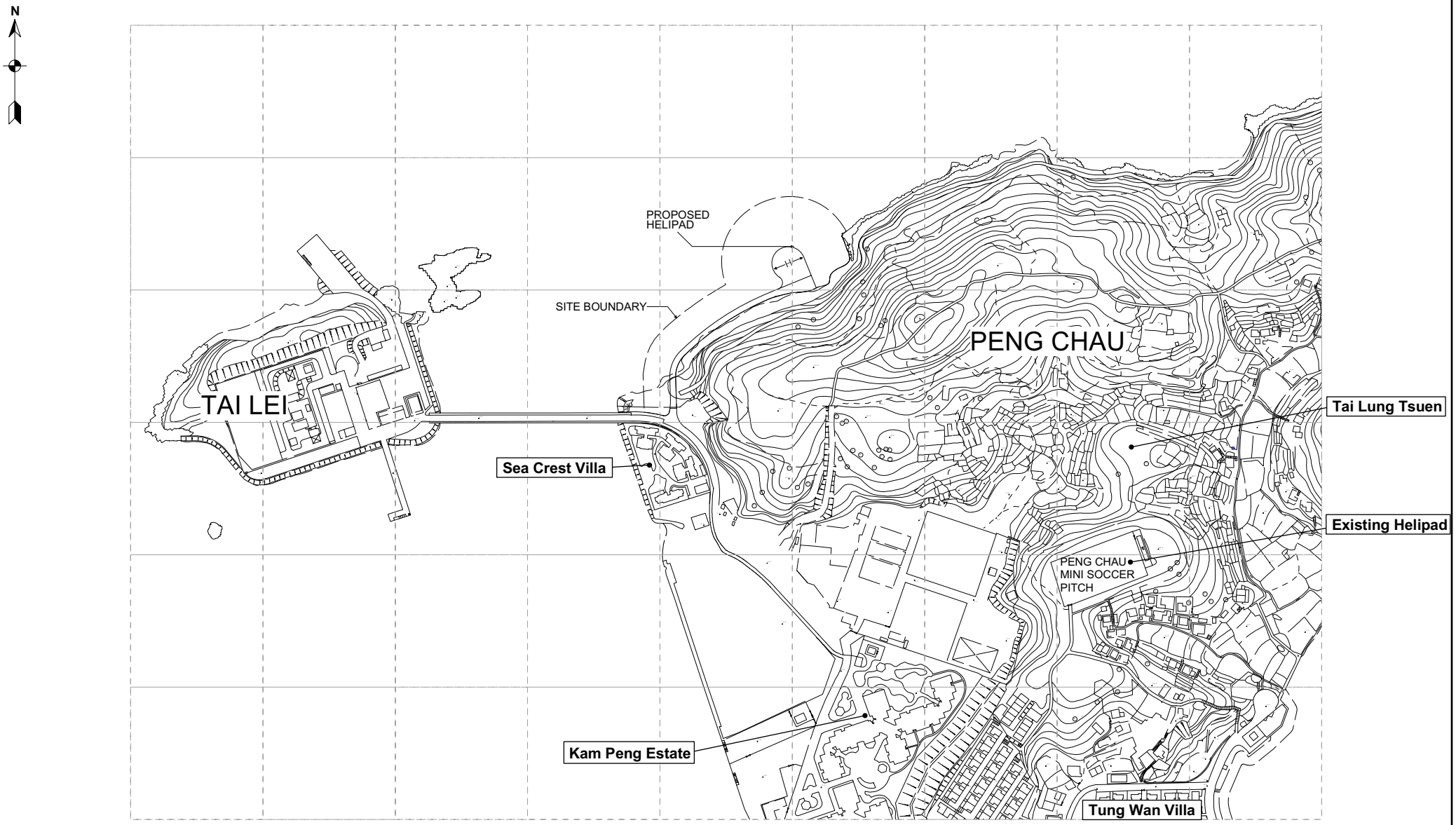
- Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.
- Travelling speeds should be controlled to reduce traffic induced dust dispersion and re-suspension within the site from the operating haul trucks.
- Erection of hoarding of not less than 2.4 m high from ground level along the site boundary.
- Any stockpile of dusty materials shall be either: (a) covered entirely by impervious sheeting; (b) placed in an area sheltered on the top and the 3 sides; or (c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.
- All dusty materials shall be sprayed with water or a dust suppression chemical immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet.

## 3.6 Environmental Monitoring and Audit Requirements

3.6.1 It is necessary to ensure proper implementation of the dust control measures as required under the Air Pollution Control (Construction Dust) Regulation. No specific construction dust monitoring is necessary, although environmental audits will be carried out to ensure proper implementation of air quality control measures.

## 3.7 Conclusions and Recommendations

3.7.1 Through proper implementation of dust control measures as required under the Air Pollution Control (Construction Dust) Regulation, construction dust can be controlled to acceptable level and no significant impacts are anticipated.




BMT

EIA Study for Peng Chau Helipad

PROPOSED HELIPAD LOCATION AND ENVIRONS

Figure 3.1

| Drawn | DEH | Checked | RBR |
|---|---|---|---|
| Scale | 1 : 4000 | Date | June 2005 |