

## 10. NOISE

### 10.1 Introduction

This *Section* provides an evaluation of the potential noise impacts associated with the construction and operation of the proposed Project.

### 10.2 Legislative Requirements and Evaluation Criteria

#### 10.2.1 Construction Noise

The principal legislation relating to the control of construction noise is the Environmental Impact Assessment Ordinance (*EIAO*) (*Cap. 499*). The Technical Memorandum on Environmental Impact Assessment Process (*EIAO-TM*), issued under the *EIAO*, provides guidelines and noise criteria for evaluating noise impacts. The assessment criteria are defined in *Annex 5* of the *EIAO-TM* with reference made to *Annex 13* of the *EIAO-TM* for the guidelines of noise assessment.

The *Noise Control Ordinance (NCO)* (*Cap. 400*) also provides statutory controls on general construction works during restricted hours (ie 1900 to 0700 hours Monday to Saturday and at any time on Sundays and public holidays). A number of Technical Memoranda (TMs) have been issued under the *NCO* to stipulate control approaches and criteria. The *Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM)*, which provides the guidelines for controlling the construction noise from the use of Powered Mechanical Equipment (PME) at the construction work sites, details the procedures that should be adopted for the assessment of noise from construction work other than percussive piling, the issuing of Construction Noise Permits (CNP), and for determining whether or not any such CNP is being complied with.

##### 10.2.1.1 General Construction Works

Under the *EIAO*, potential noise impact arising from general construction works during normal working hours (ie 0700 to 1900 hours on any day not being a Sunday or public holiday) at noise sensitive uses that rely on opened windows for ventilation, should be assessed in accordance with the noise criteria specified in the *EIAO-TM*. The *EIAO-TM* noise standards are presented in **Table 10.1**.

**Table 10.1 EIAO-TM Daytime Construction Noise Standards ( $L_{eq, 30 \text{ min}}$  dB(A))**

Use	Noise Standard (dB(A))
Domestic Premises	75
Educational Institutions (normal periods)	70
Educational Institutions (during examination periods)	65

**Notes:**

- (a) The above standards apply to uses which rely on opened windows for ventilation.
- (b) The above standards shall be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

CNP will be applied for if any works will be carried out during restricted hours (i.e. 1900 to 0700 hours of the next day and any time on Sundays and public holidays). When assessing a CNP application for the use of PME during the restricted hours, the Noise Control Authority will compare the Acceptable Noise Levels (ANLs), as promulgated in *GW-TM*, and the Corrected Noise Levels (CNLs) (i.e. after accounting for factors such as barrier effects and reflections) associated with the proposed PME operations. The ANLs are related to the noise sensitivity of the area in question and different Area Sensitivity Ratings have been established to reflect the background characteristics of different areas. The appropriate Area Sensitivity Rating for the Noise Sensitive Receiver (NSR) is determined with reference to **Table 10.2**.

**Table 10.2 Area Sensitivity Ratings**

Types of Area Containing NSR	Degree to which NSR is affected by Influencing Factor (IF)		
	Not Affected	Indirectly Affected	Directly Affected
Rural area, including Country Parks or village type developments	A	B	B
Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
Urban area	B	C	C
Area other than those above	B	B	C

**Notes:**

The following definitions apply:

- (a) "Country Park" means an area that is designated as a country park pursuant to Section 14 of the *Country Parks Ordinance*;
- (b) "Directly affected" means that the NSR is at such a location that noise generated by the IF is readily noticeable at the NSR and is a dominant feature of the noise climate of the NSR;
- (c) "Indirectly affected" means that the NSR is at such a location that noise generated by the IF, whilst noticeable at the NSR, is not a dominant feature of the noise climate of the NSR;
- (d) "Not affected" means that the NSR is at such a location that noise generated by the IF is not noticeable at the NSR; and
- (e) "Urban area" means an area of high density, diverse development including a mixture of such elements as industrial activities, major trade or commercial activities and residential premises.

The relevant ANLs are shown in **Table 10.3**.

**Table 10.3 Acceptable Noise Levels for General Construction Works**

Time period	Area Sensitivity Rating, $L_{Aeq\ 5min}$ (dB(A))		
	A	B	C
All days during the evening (ie 1900-2300 hrs) and general holidays (including Sundays) during the day and evening (ie 0700-2300 hrs)	60	65	70
All days during the night-time (ie 2300-0700 hrs of the next day)	45	50	55

The Noise Control Authority will consider a well-justified CNP application, for construction works within restricted hours as guided by the relevant TMs issued under the *NCO*. The Noise Control Authority will take into account the adjoining land uses and any previous complaints against construction activities at the site before making a decision. Nothing in this EIA Report shall bind the Noise Control Authority in making its decision. The Noise Control Authority may include any conditions in a CNP that it considers appropriate. Failure to comply with any such conditions may lead to cancellation of the CNP and prosecution action under the *NCO*.

### 10.2.2 Operation Noise

The *Technical Memorandum on Noise From Places Other than Domestic Premises, Public Places or Construction Sites (IND-TM)* issued under the *NCO* specifies the applicable ANLs for assessing potential operation noise impacts. The ANLs are dependent on the Area Sensitivity Rating and the time of the day and are presented in **Table 10.4**.

**Table 10.4 Acceptable Noise Levels for Operational Noise**

Time Period	Area Sensitivity Rating, $L_{Aeq, 30min}$ (dB(A))		
	A	B	C
Daytime: 0700-1900 hrs & Evening: 1900-2300 hrs	60	65	70
Night-time: 2300 hrs - 0700 hrs of the next day	50	55	60

Fixed plant noise is controlled under *Section 13* of the *NCO* and the predictions will be undertaken in accordance with the *IND-TM*. The noise criteria for planning and design of Designated Projects are set out in Table 1A of *Annex 5* of the *EIAO-TM* as follows:

- The noise level at the facade of the nearest NSR is at least 5 dB(A) below the appropriate ANL (as shown in **Table 10.4**) as specified in the *IND-TM*; or
- The prevailing background noise level (for quiet areas with a noise level 5 dB(A) below the appropriate ANL).

The Project is located in rural areas and there are no influencing factors affect the NSRs. Thus, an Area Sensitivity Rating of “A” is assigned. The Area Sensitivity Rating assumed in this *EIA Report* is for an indicative operation noise assessment only. It should be noted that fixed noise sources are controlled under *Section 13* of the *NCO*. At the time of investigation, the Noise Control Authority shall determine noise impact from concerned fixed noise sources on the basis of prevailing legislation and practices being in force, and taking account of contemporary conditions / situations of adjoining land uses. Nothing in this EIA Report shall bind the Noise Control Authority in the context of law enforcement against any fixed noise source being assessed.

### 10.3 Description of the Noise Environment

#### 10.3.1 Assessment Area

The Study Area of the Project is indicatively shown in **Figure 1.1**. As discussed in **Section 2.6.2**, the Project will be developed within the Key Area identified for potential CMP development as shown in **Figure 2.6**. In accordance with *Appendix H* of the *EIA Study Brief*, the Assessment Area for the noise impact assessment covers a distance of 300 m from the boundary of the Project (i.e. the Key Area identified for potential CMP development), as shown in **Figure 10.1**.

#### 10.3.2 Baseline Conditions

The Project is located in the West Lamma Channel to the west of Lamma Island and to the east of the recommended TSS between south of KYC and Fan Lau (route via south of Cheung Chau), which is rural in nature and surrounded by sea. Background noise at the Project site is dominated by the noise from the natural background and occasional marine vessel traffic. There are no existing / planned NSRs within the 300 m Assessment Area, and the nearest NSRs is at 2.8 km away from the Project boundary. Adverse fixed noise impact is not anticipated due to long distance separation, and hence prevailing background noise surveys are considered unnecessary. Potential sources of impacts due to marine traffic during operation phase would be further discussed in **Section 10.4.2**.

#### 10.3.3 Noise Sensitive Receivers

There is no statutory Outline Zoning Plan in the Assessment Area and no other relevant development plan available from Lands Department or Town Planning Board. No existing or planned NSR was identified within the Assessment Area. Seaview Garden at Cheung Chau (N1) and Village House at Tai Shan Central at Lamma Island (N2) are the nearest existing NSRs located at more than 3.1 km and 2.8 km to the west and north-east of the Project site, respectively (see **Figure 10.1**).

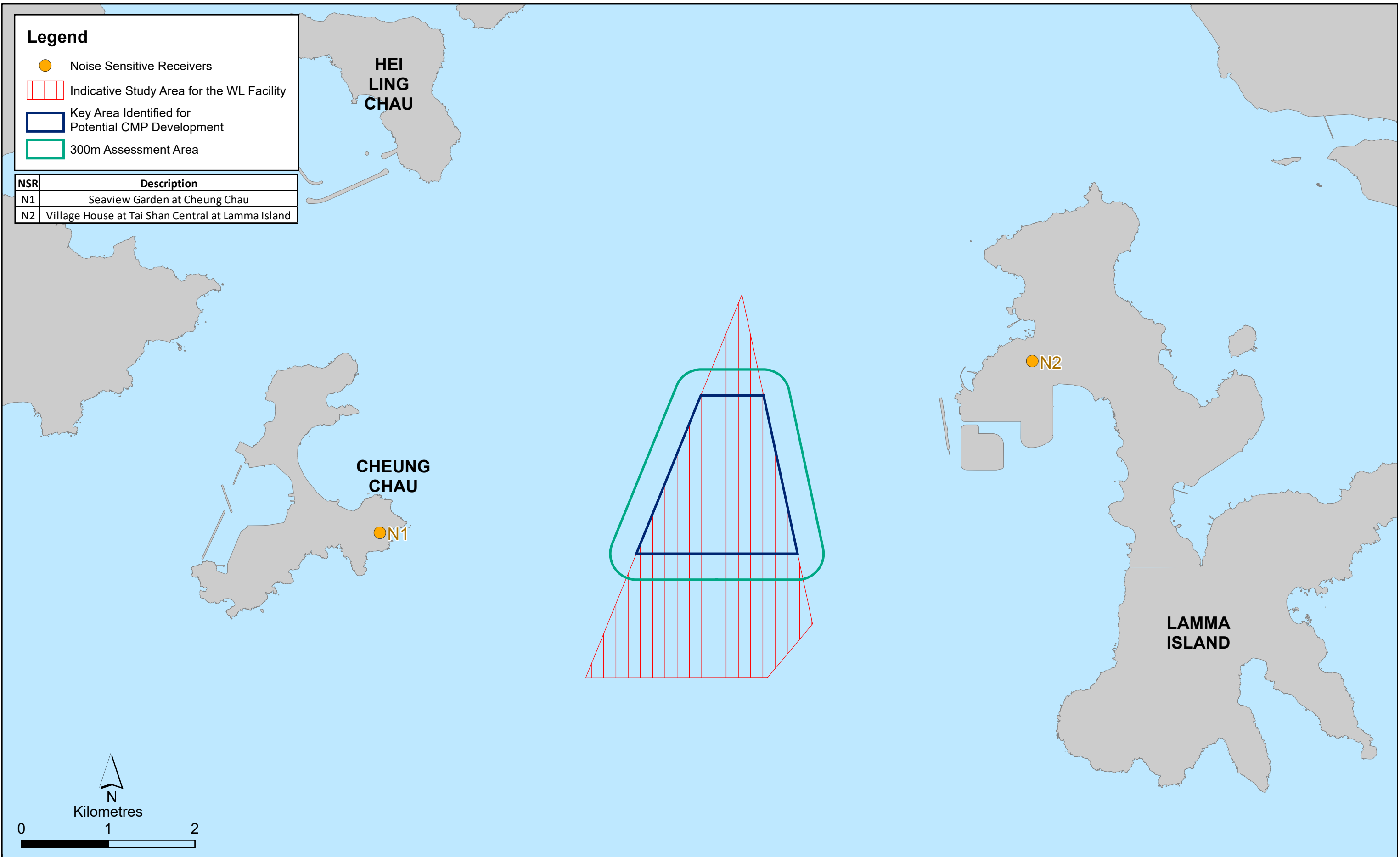


Figure 10.1

Location of Representative Noise Sensitive Receivers in the vicinity of the Project

## 10.4 Potential Sources of Impact

### 10.4.1 Construction Phase

Potential noise sources during the construction phase of the Project will mainly arise from the use of PME for marine dredging works. It is anticipated that up to 2 grab dredgers / or 1 TSHD dredger will be in operation at any time, and up to 36 tug boat/hopper barge movement per day.

The working hours of the dredging works are expected to be 24 hours a day from Monday to Sunday, including public holidays. For construction works during restricted hours, ie evening and night works between 1900 and 0700 hours of the next day or on public holidays (including Sundays), the contractor will submit a CNP application which will be assessed by the Noise Control Authority.

### 10.4.2 Operation Phase

Potential noise sources during the operation phase of the proposed Project will mainly arise from marine traffic from the vessels disposing sediment to the mud pit as backfilling and capping materials. It is expected that up to 136 tug boat/ hopper barge movements and up to 3 passenger / inspection / guide boats will be in use per day during operation phase. The operation will be 24 hours a day from Monday to Sunday, including public holidays.

## 10.5 Evaluation of Impact

As no NSRs were identified within the 300 m Assessment Area and the nearest NSR N2 at Lamma Island is located at least 2.8 km away from Project site, quantitative noise assessment for the construction and operation of the Project is considered not necessary. Due to long distance separation, adverse noise impacts are not expected during both construction and operation phases of the Project.

## 10.6 Mitigation Measures

In view of the insignificant noise impact arising from the Project, mitigation measures are therefore not required for the construction and operation phases.

## 10.7 Residual Impact

No adverse residual noise impacts are anticipated from the construction or operation of the Project.

## 10.8 Environmental Monitoring and Audit

No specific environmental monitoring and audit (EM&A) requirements related to noise are required during the construction and operation phases.

## 10.9 Cumulative Impacts

At present the known projects that are existing and planned to be constructed and operated in the vicinity of the Project site have been considered when assessing the cumulative noise impacts; these are the Hong Kong Offshore LNG Terminal, 1,800 MW Gas-fired Power Station at Lamma Extension, Re-provision of Open Cycle Gas Turbines at Lamma Power Station, Improvement Dredging for Lamma Power Station Navigation Channel and Development of a 100MW Offshore Wind Farm.

In accordance with the approved EIA Report for *Hong Kong Offshore LNG Terminal* (AEIAR-218/2018), the predicted maximum noise level due to operation of the GRS at LPS is 44dB(A) at Concerto Inn during both daytime and night-time periods.

Unit L9 and L10 gas-fired generation units are currently under operation while L11 and L12 gas-fired generation units are currently under construction at LPS. In accordance with the approved EIA Report for *1,800 MW Gas-fired Power Station at Lamma Extension* (AEIAR-010/1999), the predicted

maximum noise levels at NSR N2 near Wang Long and Ko Long due to operation of existing units at LPS and proposed units at LPS Extension Site are 30dB(A) and below.

In accordance to the submitted EIA Report for *Re-provision of Open Cycle Gas Turbines (OCGTs) at Lamma Power Station (LPS)*, the predicted maximum noise level due to operation of the OCGTs at LPS is 37dB(A) at NSR N2 near Hung Shing Yeh during both daytime and night-time periods.

Improvement dredging for the LPS navigation channel during construction phase is currently ongoing. The recurrent improvement dredging during the operation phase will also be required approximately once every four to ten years in order to maintain sufficient clearance. In accordance with the approved EIA Report for *Improvement Dredging for Lamma Power Station Navigation Channel* (AEIAR-212/2017), the predicted maximum noise levels due to construction of the Project during daytime period, including the cumulative noise impact from concurrent project (construction of L10 and L11 gas-fired generation units), are 68dB(A) at NSR N2, which are also well below the construction noise criterion of 75dB(A).

In accordance with Development of a 100MW Offshore Wind Farm in Hong Kong (AEIAR-152/2010), the predicted maximum noise level due to operation are 38dB(A) and 35dB(A) at NSR N1 and Lo So Shing at Lamma Island (locating over 3.8 km away from the Project site), respectively.

Adverse cumulative noise impacts from the abovementioned existing and planned projects are not expected during the construction and operation phases of the Project.

## 10.10 Conclusion

No existing or planned NSR was identified within the Assessment Area for the Project. The nearest NSR N2 at Lamma Island is located at least 2.8 km away from the Project site. Therefore, adverse noise impact associated with the construction and operation of the Project is not anticipated.

Mitigation measures and noise monitoring are therefore considered not necessary during both the construction and operation phases of the Project.