6 NOISE

6.1 INTRODUCTION

This Section provides an evaluation of the potential noise impacts associated with the construction and operation of the Project, associated works and marine activities.

6.2 LEGISLATIVE REQUIREMENTS AND EVALUATION CRITERIA

6.2.1 Construction Noise


The Noise Control Ordinance (NCO) (Cap. 400) also provides statutory controls on general construction works during restricted hours (i.e. 1900 – 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 noise 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.

General Construction Works

Under the EIAO, the potential noise impact arising from general construction works during normal working hours (i.e. 0700 to 1900 hours on any day not being a Sunday or public holiday) at noise sensitive receivers 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 6.1.
Table 6.1  **EIAO-TM Daytime Construction Noise Standards (Leq. 30 min dB(A))**

<table>
<thead>
<tr>
<th>Uses</th>
<th>Noise Standards (dB(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Premises</td>
<td>75</td>
</tr>
<tr>
<td>Educational Institutions</td>
<td>70</td>
</tr>
<tr>
<td>Educational Institutions (during examination periods)</td>
<td>65</td>
</tr>
</tbody>
</table>

**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.

When assessing a CNP application for the use of PME during the restricted hours (i.e. 1900 to 0700 hours of the next day and any time on Sundays and public holidays), 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 (ASRs) have been established to reflect the background characteristics of different areas. The appropriate ASR for the Noise Sensitive Receiver (NSR) is determined with reference to **Table 6.2**.

**Table 6.2  Area Sensitivity Ratings**

<table>
<thead>
<tr>
<th>Types of Area Containing NSR</th>
<th>Degree to which NSR is affected by Influencing Factor (IF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural area, including Country Parks or village type developments</td>
<td>Not Affected</td>
</tr>
<tr>
<td>Low density residential area consisting of low-rise or isolated high-rise developments</td>
<td>A</td>
</tr>
<tr>
<td>Urban area</td>
<td>B</td>
</tr>
<tr>
<td>Area other than those above</td>
<td>B</td>
</tr>
</tbody>
</table>

**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 6.3**.
Table 6.3  

**Acceptable Noise Levels for General Construction Works (ANLs, \(L_{eq.5\min}\) dB(A))**

<table>
<thead>
<tr>
<th>Time period</th>
<th>Area Sensitivity Rating (dB(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>All days during the evening (i.e. 1900-2300 hours) and general holidays (including Sundays) during the day and evening (i.e. 0700-2300 hours)</td>
<td>60</td>
</tr>
<tr>
<td>All days during the night-time (i.e. 2300-0700 hours of the next day)</td>
<td>45</td>
</tr>
</tbody>
</table>

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.

### 6.2.2 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 ASR and the time of the day and are presented in Table 6.4.

Table 6.4  

**ANLs to be used as Fixed Plant Noise Criteria**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>(L_{eq.30\min}) (dB(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASR “A”</td>
</tr>
<tr>
<td>Day-time (i.e. 0700-1900 hours)</td>
<td>60</td>
</tr>
<tr>
<td>Evening (i.e. 1900-2300 hours)</td>
<td>60</td>
</tr>
<tr>
<td>Night-time (i.e. 2300-0700 hours of the next day)</td>
<td>50</td>
</tr>
</tbody>
</table>

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 6.4) 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).
Where Project construction works sites are located in rural areas and no influencing factors affect the NSRs, an ASR of “A” is assigned. Where background noise levels are considered lower than ASR “A”, baseline noise measurements can be conducted to investigate the prevailing noise levels and to establish the noise limits for the assessment of the operational noise impacts. Details of the noise measurements for the Project are discussed further in Section 6.3.4.

The ASR 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.

6.3 DESCRIPTION OF THE NOISE ENVIRONMENT

6.3.1 Assessment Area

In accordance with the requirements given in Clause 3.4.6.3 and Appendix C of the EIA Study Brief, the Assessment Area for the noise impact assessment covers a distance of 300m from the boundary of the Project. The Assessment Area considered in the assessment is shown in Figure 6.1.

6.3.2 Baseline Conditions

The GRSs are located at the BPPS at Black Point in Tuen Mun, and the LPS on Lamma Island. Black Point and Lamma Island are rural in nature and surrounded by natural terrain. To the west of the GRS at the BPPS is open sea, whereas to the south of the GRS at the LPS is open sea. Background noise at both GRS sites is dominated by the operation of the existing power stations.

The LNG Terminal is located offshore in the southern HKSAR waters. The noise environment is anticipated to be dominated by the noise from the natural background and occasional marine vessel traffic.

6.3.3 Noise Sensitive Receivers

The statutory Outline Zoning Plans (OZP) and other relevant development plan available from Lands Department or Town Planning Board have been reviewed with regard to the Assessment Area. The GRS (and related Assessment Area) at the BPPS is located within the boundary of the existing BPPS which is not covered by any OZP (see Figure 11.2). The GRS (and related Assessment Area) at the LPS is located within the boundary of the existing LPS, covered by the approved Lamma Outline Zoning Plan S/I-LI/11 under zoning ‘Other Specified Uses – For “Power Station” only’ (see Figure 11.3). There is no existing OZP in the Assessment Area for the LNG Terminal.
No existing or planned NSRs were identified within the Assessment Area. The first layer of NSRs were identified to be located approximately 1.3km away from the sites of the GRS at the BPPS and the GRS at the LPS, approximately 2km from the LPS Pipeline during construction, and approximately 4.7km from the LNG Terminal Project site during operation.

The Soko Islands are located at approximately 4.5km from the Projects site boundary. There is an ex-Vietnam Refugee camp that is no longer in use and with no other existing noise sensitive uses. A preliminary feasibility study for a spa and resort development at Soko Islands is being undertaken by the Civil Engineering and Development Department (CEDD). No confirmed development plan is available at this time. In view of the large separation distance between the Soko Islands and the Project, any sensitive uses at the Soko Islands are not expected to be adversely affected by the construction and operation of the Project.

Site visits were carried out to review the current situation for the first layer of existing NSRs near the BPPS and the LPS. A site visit carried out on 20 July 2017 in the vicinity of the BPPS identified that the uses of Lung Kwu Sheung Tan is currently industrial storage sites, and therefore, no existing NSR was identified in the vicinity of the BPPS during the site visit. A site visit was also carried out on 1 to 2 August 2017 in the vicinity of the LPS. Existing and planned NSRs are listed in Table 6.5 and shown in Figure 6.1. Photographs of the existing NSRs are presented in Annex 6A.

### Table 6.5  Identified Noise Sensitive Receivers (NSRs)

<table>
<thead>
<tr>
<th>NSR ID</th>
<th>Description</th>
<th>Use</th>
<th>Approximate Distance to nearest Project Site (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>Village House at Tai Shan Central at Lamma Island</td>
<td>Existing</td>
<td>1.3 (a)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Residential</td>
<td></td>
</tr>
<tr>
<td>N2</td>
<td>Concerto Inn</td>
<td>Existing Hotel</td>
<td>1.6 (a)</td>
</tr>
<tr>
<td>N3</td>
<td>Proposed Residential Development in Lung Kwu Tan Reclamation Area</td>
<td>Planned</td>
<td>1.7 (a)</td>
</tr>
<tr>
<td>N4</td>
<td>Shek Kwu Chau Treatment and Rehabilitation Centre</td>
<td>Existing Convalescent Home</td>
<td>2.0 / 4.7 (b)</td>
</tr>
</tbody>
</table>

Notes:
(a) Nearest distance for both construction and operation phases.
(b) 2.0/4.7km is the nearest distances between N4 and the LPS Pipeline during the construction phase, and N4 and the LNG Terminal Project site during the operation phase, respectively.
N1 - Village House at Tai Shan Central at Lamma Island

The Village House at Tai Shan Central at Lamma Island (NSR N1) is located approximately 1.3km to the north of the GRS at the LPS. The direct line of sight of NSR N1 to the GRS at the LPS is screened by the existing building structures of the LPS.

N2 - Concerto Inn at Lamma Island

Concerto Inn (NSR N2) is an existing hotel located approximately 1.6km to the north-east of the GRS at the LPS. Openable doors are provided for the balcony of the guest rooms, such that the occupants are considered as a NSR that may be affected by the Project.

N3 - Proposed Residential Development in Lung Kwu Tan Reclamation Area

Reference has been made to the approved EIA for Additional Gas-fired Generation Units Project (AEIAR-197/2016), where the direct lines of sight between the site for the GRS at the BPPS and the Proposed Residential Development in Lung Kwu Tan Reclamation Area (NSR N3), which is located 1.7km, are screened by the natural terrain.

N4 - Shek Kwu Chau Treatment and Rehabilitation Centre

Shek Kwu Chau Treatment Rehabilitation Centre (NSR N4) is located approximately 2km to the north of the LPS Pipeline and 4.7km to the north-east of the LNG Terminal Project site.

For NSRs N1 and N3, the separation distances between the nearest Project sites (i.e. the GRS at the LPS and the GRS at the BPPS, respectively) and these NSRs are at least 1.3km, and they are screened by the natural terrain and existing building structures, therefore unacceptable noise impacts due to the construction and operation of the Project are not anticipated. Based on this, a quantitative noise assessment is considered not necessary at NSRs N1 and N3. Considering NSR N4 is located approximately 2km away from the LPS Pipeline construction, and about 4.7km away from the Jetty construction, noise from the LPS Pipeline and the Jetty construction will not be noticeable at NSR N4. During the operation phase, no noise impact is anticipated from the LPS Pipeline. As the LNG Terminal Project site is located approximately 4.7km away from the NSR N4, adverse noise impact is also not anticipated. Based on the above, a quantitative noise assessment is also considered not necessary at NSR N4.

Summary

Despite the large separation distance of approximately 1.6km between the GRS at the LPS and NSR N2, in view of the background noise environment at NSR N2 being typically rural in nature, and it being the nearest unscreened NSR to the GRS site, operation of the GRS at the LPS may have potential fixed noise impacts to this NSR. Based on the above, NSR N2 is identified as the
representative NSR for a quantitative operational noise impact assessment to present the worst case scenario from the Project. As NSR N2 is located approximately 18km away from the LNG Terminal, no adverse noise impact on the NSR N2 is anticipated.

6.3.4 Baseline Noise Measurement

To investigate the prevailing noise levels at the NSR N2, noise measurements were taken at Concerto Inn on Lamma Island on 1 and 2 August 2017. The noise measurement was conducted using a Solo 01 Premium Sound Level Meter (Type 1), which had been calibrated using a 01dB-Stell CAL21 Sound Calibrator with a calibration signal of 94.0 dB(A) at 1kHz. The microphone was set at 1.2m above ground level with facade reflection. The measurements were conducted in accordance with the calibration and measurement procedures stated in the IND-TM. The measurement location is shown in Figure 6.2 with measured prevailing background noise levels summarised in Table 6.6.

Table 6.6 Measured Prevailing Background Noise Levels

<table>
<thead>
<tr>
<th>Location</th>
<th>Time Periods</th>
<th>Averaged Measured Noise Levels (Measured Noise Levels), $L_{eq}^{(30min)}$ dB(A) (b)</th>
<th>ANL-5 for ASR “A”, dB(A) (a)</th>
<th>Operational Noise Criteria, dB(A) (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N2</td>
<td>Daytime &amp; Evening</td>
<td>54 (54.1 &amp; 54.2)</td>
<td>55</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Night-time</td>
<td>55 (54.8 &amp; 54.8)</td>
<td>45</td>
<td>45</td>
</tr>
</tbody>
</table>

Notes:
(a) IND-TM specifies the applicable Acceptable Noise Levels (ANLs) for the operation of the Project. The noise criteria for planning and design of Designated Projects are set out in 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 6.4) 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).
(b) The background noise is mainly dominated by the sound of sea waves.

6.4 Potential Sources of Impact

6.4.1 Construction Phase

Potential noise sources during the construction phase of the Project will mainly arise from PME operating at the construction works sites in the HKSAR southern waters, the BPPS and the LPS. The major construction works will include:

- Construction of the Jetty;
- Marine construction activities for the subsea BPPS Pipeline and the LPS Pipeline; and
- Construction of the GRSs at the BPPS and the LPS.
The working hours of the contractors for land-based works are anticipated to be 24 hours a day from Monday to Sunday, including public holidays. The working hours of the contractors for marine works are expected to be 24 hours a day from Monday to Sunday, including public holidays. For 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.

6.4.2 Operation Phase

Fixed plant noise associated with the Project will arise from the operation of the plant items listed below:

- FSRU Vessel;
- Jetty topsides;
- LNGC (when on berth to unload LNG cargo only); and
- GRSs at the BPPS and the LPS.

The operation of the above plant items will be 24 hours a day from Monday to Sunday, including public holidays.

There will not be any noise impact due to the operation of the BPPS Pipeline and the LPS Pipeline as they will be buried under the seabed. Also, the operation of the FSRU Vessel, Jetty and LNGC, and GRS at the BPPS will not induce any noise impact to NSRs as discussed in Section 6.3.3.

6.5 Assessment Methodology

6.5.1 Construction Phase

As no NSRs were identified within the 300m Assessment Area and the nearest representative NSRs are located approximately 1.3km from the Project’s construction works sites, adverse noise impacts due to construction works activities of the Project are not anticipated. Therefore, quantitative noise assessment for the construction works of the Project is considered not necessary.

6.5.2 Operation Phase

Since no NSR was identified within the 300m Assessment Area and the nearest NSR N1 is located at approximately 1.3km from the Project’s operational sites, noise impacts due to operational activities of the Project are not anticipated as the direct line of sight of NSR N1 to the GRS at the LPS is screened by the existing building structures of the LPS. As a conservative assessment, as operational noise criteria are more stringent, and in view of the background noise environment which is typically rural in nature, and as per the requirements in the EIA Study Brief, a quantitative noise assessment has been carried out for the operation of the GRS at the LPS for the nearest unscreened
representative NSR N2 which is approximately 1.6km away. This is the next nearest NSR with direct line of sight towards the GRS at the LPS. With reference to the discussion in Section 6.3.3, a quantitative operational noise assessment for the other NSRs is considered not necessary.

As such, the fixed plant noise sources from the GRS at the LPS are identified as the major noise sources from the Project which may cause noise impact to the NSR N2. The worst case operation mode which represents the maximum noise emission in connection with the identified fixed noise sources of the operation of the GRS at the LPS has been assessed.

The methodology used for the quantitative fixed plant noise assessment is in accordance with the procedures outlined in the IND-TM and the EIAO-TM and is presented below:

- Identify the types of equipment and their number;
- Calculate the maximum total SWL from the GRS at the LPS;
- Identify representative NSR as defined by the EIAO-TM based on existing and committed land uses in the Assessment Area that may be affected by the site of the GRS at the LPS;
- Calculate the distance correction factors, using a conservative approach, based on the horizontal distance between the NSR and the noise sources;
- Calculate the corrected noise levels after taking into account other corrections such as potential screening effects, if any, by adopting standard acoustics principles; and
- Present the results in terms of Leq, 30min dB(A), as specified in the IND-TM.

The predicted noise levels at the NSR N2 (see Section 6.6.2) were compared with the criteria set out in Section 6.3.4.

With regard to the quantitative operational noise assessment for the GRS at the LPS, reference has been made to the manufacturers’ data and the field measurements. As a conservative approach, it is assumed that all GRS equipment will be operated on a 24-hour basis. The equipment inventory of the GRS at the LPS together with their respective sound power levels (SWLs) are presented in Annex 6B.

6.6 EVALUATION OF IMPACT

6.6.1 Construction Phase

As no NSRs were identified within the 300m Assessment Area and the nearest representative NSRs are located approximately 1.3km away from the Project’s construction works sites, adverse noise impacts due to the construction activities are not anticipated.
6.6.2 **Operation Phase**

The predicted noise levels at the identified NSR N2 due to operation of the GRS at the LPS are summarised in *Table 6.7*. Detailed calculation of predicted noise levels are presented in *Annex 6C*.

**Table 6.7** *Predicted Noise Level at the Representative NSR (N2)*

<table>
<thead>
<tr>
<th>NSR ID</th>
<th>Predicted Noise Level, dB(A)</th>
<th>Noise Criteria, dB(A)(b)</th>
<th>Compliance (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N2</td>
<td>44 (a)</td>
<td>44 (a)</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>54</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Note:*
(a) D: Daytime and Evening, 0700-2300 hours, N: Night, 2300-0700 hours.
(b) Please refer to *Table 6.6*.

Based on the plant inventory presented in *Annex 6B*, results of the quantitative noise assessment due to operation of the GRS at the LPS indicate that the predicted noise levels at 1m from the facade of the NSR N2 comply with both noise criteria during daytime and night-time periods.

As the identified NSRs are located at least 1.3km from the Project sites (BPPS, LPS and southern Hong Kong waters) which are separated by distances of at least 15km, cumulative impacts from the Project components are therefore not expected during both construction and operation phases of the Project.

6.7 **MITIGATION MEASURES**

6.7.1 **Construction Phase**

In view of the insignificant noise impact arising from the Project, no mitigation measures are required for the construction phase.

6.7.2 **Operation Phase**

The predicted noise levels for the conservative quantitative assessment at the representative NSR N2 at the GRS at the LPS are well below the daytime and night time criteria as a result of the considerable separation distance between the NSR N2 and the GRS at the LPS. Therefore, no mitigation measures are required during the operation phase.

6.8 **RESIDUAL IMPACT**

No unacceptable residual noise impacts are anticipated from the construction or operation of the Project.
6.9 \textit{ENVIRONMENTAL MONITORING AND AUDIT}

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

6.10 \textit{CUMULATIVE IMPACTS}

At present the known projects that are existing, committed and planned to be constructed and operated in the vicinity of the Project sites have been considered when assessing the cumulative noise impacts; these are the Additional Gas-fired Generation Units Project at the BPPS, Additional Gas-fired Generation Units at the LPS, and Improvement Dredging for Lamma Power Station Navigation Channel, as presented in \textit{Annex 3A}.

In accordance with the EIA Report of Additional Gas-fired Generation Units Project (AEIAR-197/2016), the construction and installation of the CCGT Unit No. 1 is expected to be completed by end of 2019. As the direct line of sight between the BPPS and NSR N3 are screened by the natural terrain, cumulative construction and operation noise impacts are not anticipated at NSR N3.

The construction of two new gas-fired units at the LPS, i.e. L10 and L11, has commenced, and they are expected to be commissioned in 2020 and 2022, respectively. In accordance with the EIA Report for 1,800 MW Gas-fired Power Station at Lamma (AEIAR-010/1999), the predicted maximum noise level due to construction are 55dB(A) at NSR N1 and 62dB(A) at Hung Shing Ye near NSR N2, which are well below noise criterion of 75dB(A). The predicted noise level due to operation of these new plants are below 30dB(A) at NSR N1 and 45dB(A) at Hung Shing Ye near NSR N2. Therefore operational noise impact is considered insignificant. Cumulative noise impacts of all these existing, committed and planned projects are not expected for the construction and operation phases of the Project.

In accordance with the EIA for Improvement Dredging for Lamma Power Station Navigation Channel (EIA-251/2017), the recurrent improvement dredging during the operation phase will be required approximately once every four to ten years in order to maintain sufficient clearance. 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), are 68dB(A) and 65dB(A) at NSRs N1 and N2, respectively, which comply with the construction noise criterion of 75dB(A). No adverse noise impact is anticipated during operational phase and hence no quantitative operational noise impact assessment was carried out in the EIA for Improvement Dredging for Lamma Power Station Navigation Channel. Therefore, no cumulative noise impacts are anticipated during construction and operation phases.
6.11 **CONCLUSION**

No existing or planned NSR was identified within the Assessment Area for the Project and all NSRs are located approximately 1.3km or farther away from the Project sites, therefore unacceptable noise impact associated with the construction and operation of the Project is not anticipated.

Predicted noise levels at NSR N2 due to the operation of the GRS at the LPS indicated full compliance with the relevant operational noise criteria during both daytime and night-time periods.

Mitigation measures are therefore not required in meeting the requirements of *Section 6 of Annex 13* of the *EIAO-TM*. Noise monitoring is also considered not necessary during both the construction and operation phases of the Project.
Legend

- **Boundary of HKSAR**
- **Proposed GRS Location at BPPS**
- **Proposed GRS Location at LPS**
- **Proposed Route of BPPS Pipeline**
- **Proposed Route of LPS Pipeline**
- **Proposed Site for LNG Terminal**
- **NSR**
- **300m Assessment Area**

<table>
<thead>
<tr>
<th>NSR ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>Village House at Tai Shan Central</td>
</tr>
<tr>
<td>N2</td>
<td>Concerto Inn</td>
</tr>
<tr>
<td>N3</td>
<td>Proposed Residential Development in Lung Kwu Tan Reclamation Area</td>
</tr>
<tr>
<td>N4</td>
<td>Shek Kwu Chau Treatment and Rehabilitation Centre</td>
</tr>
</tbody>
</table>

Figure 6.1

Location of Noise Sensitive Receivers

File: T:\GIS\CONTRACT\0359722\Mxd\EIA\0359722_NSR_EIA.mxd
Date: 30/4/2018

Environmental Resources Management
Figure 6.2

Baseline Noise Monitoring Location

Legend
- Proposed Route of LPS Pipeline
- Proposed GRS Location at LPS
- Baseline Noise Monitoring Location

File: T:\GIS\CONTRACT\0359722\Mxd\0359722_Baseline_Noise_Monitoring_Location.mxd
Date: 16/4/2018
Annex 6A

Photograph of Representative Noise Sensitive Receivers (NSRs)
NSR N1
Village House at Tai Shan Central, Lamma Island

NSR N2
Concerto Inn
NSR N4
Shek Kwu Chau Treatment and Rehabilitation Centre

Note:
(a) Photograph of NSR N4 (Shek Kwu Chau Treatment and Rehabilitation Centre) made reference to the approved EIA for Development of the Integrated Waste Management Facilities Phase 1 (AEIAR – 163/2012).
(b) No photograph is available for NSR N3 as it is a planned NSR.
Annex 6B

Operation Plant Inventory
### Annex 6B - Operation Plant Inventory

<table>
<thead>
<tr>
<th>Description</th>
<th>Reference</th>
<th>Operating Hours</th>
<th>No. of PME</th>
<th>SWL, dB(A)</th>
<th>SWL, dB(A)</th>
<th>Total SWL, dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRS at LPS</td>
<td>(1)</td>
<td>24-hour</td>
<td>4</td>
<td>75</td>
<td>81</td>
<td>156</td>
</tr>
<tr>
<td>Water Bath Heater Skid</td>
<td>(1)</td>
<td>24-hour</td>
<td>1</td>
<td>107</td>
<td>107</td>
<td>214</td>
</tr>
<tr>
<td>Pressure Control Skid 1</td>
<td>(1)</td>
<td>24-hour</td>
<td>1</td>
<td>107</td>
<td>107</td>
<td>214</td>
</tr>
<tr>
<td>Pressure Control Skid 2</td>
<td>(1)</td>
<td>24-hour</td>
<td>1</td>
<td>107</td>
<td>107</td>
<td>214</td>
</tr>
<tr>
<td>Pressure Control Skid 3</td>
<td>(1)</td>
<td>24-hour</td>
<td>1</td>
<td>107</td>
<td>107</td>
<td>214</td>
</tr>
<tr>
<td>Pressure Control Skid 4</td>
<td>(1)</td>
<td>24-hour</td>
<td>1</td>
<td>107</td>
<td>107</td>
<td>214</td>
</tr>
</tbody>
</table>

Note:
(1) Noise data is provided by HK Electric based on the equipment specification adopted in the existing GRS at LPS.
Annex 6C

Operational Noise Impact Assessment
Annex 6C - Operation Noise Assessment

A) Calculation of Noise Levels at N2

<table>
<thead>
<tr>
<th>Plant Item</th>
<th>Max. SWL, dB(A)</th>
<th>Distance between Source to NSR</th>
<th>Correction, dB(A)</th>
<th>CNI of individual PME, dB(A)</th>
<th>Overall CNL, dB(A)</th>
<th>Compliance</th>
<th>Night-time Criteria, dB(A)</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRS at LPS</td>
<td>113</td>
<td>1570</td>
<td>-72</td>
<td>0</td>
<td>3</td>
<td>44</td>
<td>44</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Remarks:
1) Corrected Noise Level (CNL) = Max. SWL + distance correction + Barrier correction + façade correction
2) If noise totally screened by any structure such that none of the fixed plant noise sources will be visible from the NSR, a negative correction factor of 10 dB(A) is applied in the assessment. Otherwise, 0 dB(A) is applied in the assessment.