APPENDIX 13.2: SUMMARY OF LEGISLATION AND GUIDANCE

For a development of this nature, there is no specific all-encompassing legislation relating to the standards associated with noise emission / effects. Noise legislation, where it does exist, tends to be either EC-derived and focussed on specific items of noise-emitting plant or on more general nuisance, such as that addressed by the provisions of the Environmental Protection Act 1990.

In lieu of any specific legislation, assessing the effect of such a development during the construction, operational and decommissioning phases must draw on information from a variety of sources. Therefore, this assessment makes reference to a number of British Standards, official planning advice notes and national guidance.

Of relevance to the noise assessment presented within this chapter, regard has been given to the following policies / guidance:

Planning Advice Note (PAN) 1/2011: ‘Planning and Noise’

Published in March 2011, this document provides advice on the role of the planning system in helping to prevent and limit adverse effects of noise (Scottish Government, 2011). Information and advice on noise assessment methods are provided in the accompanying Technical Advice Note (TAN): Assessment of Noise. Included within the PAN document and the accompanying TAN are details of the legislation, technical standards and codes of practice for specific noise issues.

Neither PAN 1/2011 nor the associated TAN provide specific guidance on the assessment of noise from fixed plant, but the TAN includes an example assessment scenario for ‘New noisy development (incl. commercial and recreation) affecting a noise sensitive building’, which is based on BS 4142: 1997: Method for rating industrial noise affecting mixed residential and industrial areas. This British Standard has been replaced with BS 4142: 2014+A1: 2019: Methods for rating and assessing industrial and commercial sound.

The Institute of Environmental Management & Assessment (IEMA) - Guidelines for Environmental Noise Impact Assessment, 2014

The Institute of Environmental Management & Assessment (IEMA): Guidelines for Environmental Noise Impact Assessment published in October 2014 address the key principles of noise impact assessment and are applicable to all development proposals.

The document describes the process of assessing noise by identifying ‘Sensitive Receptors’ and determining a ‘Magnitude of Impact’ for each of the identified receptors. The process by which magnitude of impact is identified includes assessment of noise level change with ‘context’ being provided by absolute noise levels. The guidelines provide the following examples:

“A development proposal which would cause an increase in an existing level that is already well above an existing guideline should probably be regarded as worse than if the existing level were below the guideline.”

“Similarly, but at the other end of the scale, for an area which is valued because of the soundscape, a relatively small impact could be considered as having a potentially substantive effect if the quality of the noise environment were to be eroded. This particularly relates to tranquil, quiet or calm areas.”
The process detailed within the guidelines also gives consideration to numerous other relevant factors including:

- time of day;
- averaging time period;
- nature of source;
- frequency of occurrence;
- spectral characteristics; and
- noise indicators (the measurement parameters used in the assessment).

Once the Magnitude of Impact and Sensitivity of Receptor are established, the resulting effects are described / classified. For a standalone noise impact assessment, the noise effect of the proposal is then determined. For an EIA development the significance of each effect is evaluated before the noise effect of the proposals is determined.

**British Standard 8233: 2014: Guidance on sound insulation and noise reduction for buildings**

This British Standard provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings exposed to steady external noise sources. It is stated in the British Standard that it is desirable for internal ambient noise level not to exceed the criteria set out in below.

**Table 1: Summary of internal ambient noise level criteria for dwellings from with BS 8233: 2014**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Location</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>07:00 to 23:00 Hours, i.e. Daytime</td>
</tr>
<tr>
<td>Resting</td>
<td>Living Room</td>
<td>35 dB L_{Aeq,16hour}</td>
</tr>
<tr>
<td>Dining</td>
<td>Dining Room/Area</td>
<td>40 dB L_{Aeq,16hour}</td>
</tr>
<tr>
<td>Sleeping (daytime resting)</td>
<td>Bedroom</td>
<td>35 dB L_{Aeq,16hour}</td>
</tr>
</tbody>
</table>

With respect to external amenity space such as gardens and patios, it is stated that it is desirable that the noise level does not exceed 50 dB L_{Aeq,T}, with an upper guideline value of 55 dB L_{Aeq,T} which would be acceptable in noisier environments. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

With respect to external noise levels it is stated that:

"To protect the majority of people from being seriously annoyed during the daytime, it is recommended that the sound pressure level on balconies, terraces, and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor noise level should not exceed 50 dB L_{Aeq}."
The internal noise level criteria stated in BS 8233: 2014 are concordant with the WHO guidelines. With respect to the night-time $L_{A\text{Fmax}}$ noise levels, the WHO makes reference to guidance which states:

"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB $L_{A\text{Fmax}}$ more than 10-15 times per night"

On this basis, for the purpose of assessing night-time $L_{A\text{Fmax}}$ noise events, it is considered appropriate to assess a typical measured $L_{A\text{Fmax}}$ noise event against the criterion of 45 dB $L_{A\text{Fmax}}$ internally.


British Standard 4142 describes methods for rating and assessing the following:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

In accordance with the assessment methodology, the specific sound level ($L_{A\text{eq,T}}$) of the noise source being assessed is corrected, by the application corrections for acoustic features, such as tonal qualities and/or distinct impulses, to give a "rating level" ($L_{A\text{r,Tr}}$). The British Standard effectively compares and rates the difference between the rating level and the typical background sound level ($L_{A\text{90,T}}$) in the absence of the noise source being assessed.

The British Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) when the noise source in question is likely to operate or is proposed to operate in the future.

Comparing the rating level with the background sound level, BS 4142 states:

"Typically, the greater this difference, the greater the magnitude of impact.

A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

In this assessment consideration has been given to both BS 4142 and BS 8233, in order to ensure that the development proposals are considered in context of the prevailing noise environment.

This document published in October 1993 details a method for predicting and assessing noise emissions from overhead power lines based on a number of research papers and associated historical measurements of noise levels generated by overhead lines, and the guidance within the 1990 version of BS 4142.

The document explains the sources of noise associated with overhead power lines during dry conditions and wet conditions, specifically the following is stated:

"Noise is produced by corona discharges which occur when the electric stress at the surface of a conductor exceeds the breakdown strength of air. Transmission lines are designed to operate below this "corona threshold". However, surface irregularities such as raindrops or solid debris produce voltage gradient enhancements. These may then exceed the threshold or "inception" level and become point sources for corona discharge. At each discharge site, a portion of the energy associated with the corona process is released as acoustic energy which radiates into the air as sound pressure waves. It can be seen from the mechanism of corona discharge generation that transmission line noise will be intermittent in nature.

The magnitude of the audible noise depends on the nature of these surface irregularities. Well-made conductors are normally free from surface defects, but they cannot be kept free from raindrops. Hence rain-induced audible noise is generally the major consideration for the noise section of an Environmental Statement. The relationship between rainfall and corona noise has been studied, and measurements have also been made of corona noise resulting from the presence of solid debris; this information can be used for assessment purposes."

"Audible noise in wet weather is generated by water droplets on the energised conductors distorting under the electric field and causing a localised enhancement of the electric stress, thus initiating corona discharge activity and hence audible noise."

The assessment methodology provides an approach to estimating the noise levels from the overhead line during dry conditions and wet conditions and background noise levels during different rainfall rates and assesses resulting levels based on these estimates.