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IED LICENCE P1172-01

NOISE MANAGEMENT PLAN AUGUST 2023

Technical Report Prepared For

Amazon Data Services Ireland Limited

Technical Report Prepared By

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EXECUTIVE SUMMARY

Amazon Data Services Ireland Limited operate a facility in the IDA Blanchardstown Business and Technology Park, Ballycoolin Road and Snugborough Road, Blanchardstown, Dublin 15 that operates under an Industrial Emissions Licence (IEL) (Licence Register Number: P1172-01) as issued by the Environmental Protection Agency (EPA).

This licence is for the operation of emergency standby generators as part of a data storage campus located at the IDA Blanchardstown Business and Technology Park. The campus consists of four data storage buildings (Building A, B, C and D) containing data halls. The data halls house IT hardware which host, manage and distribute electronic data.

Section 6.11.2.1 of the IEL associated with the site calls for the development and provision of a Noise Management Plan (NMP) within two months of the date of the grant of the licence.

This NMP details the methods by which the operator will systematically assess, reduce and prevent noise emissions from the site, in accordance with the requirements of the EPA and the issued IEL in line with the guidance contained in *'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' (2016)* as published by the Agency.

In line with the IED licence Item 6.11.2.7 this NMP will be reviewed annually following completion of the annual noise monitoring that is a requirement of IEL Item 6.11.1 or in the event of the receipt of a valid noise complaint.

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1.0 INTRODUCTION

Amazon Data Services Ireland Limited operate a facility in the IDA Blanchardstown Business and Technology Park, Ballycoolin Road and Snugborough Road, Blanchardstown, Dublin 15 that operates under an Industrial Emissions Licence (IEL) (Licence Register Number: P1172-01) as issued by the Environmental Protection Agency (EPA).

This licence is for the operation of emergency backup generators as part of a data storage campus located at the IDA Blanchardstown Business and Technology Park. The site is occupied by four no. data storage buildings (Buildings A, B, C and D) with ancillary elements. The ancillary elements of the development include loading bays, maintenance and storage spaces, associated water tanks, sprinkler, tanks, pump house and electrical rooms, security and utility spaces, underground foul and stormwater drainage network, on site attenuation systems, internal roading network, and site landscaping. The overall site includes the Cloghran 110 kV AIS Substation.

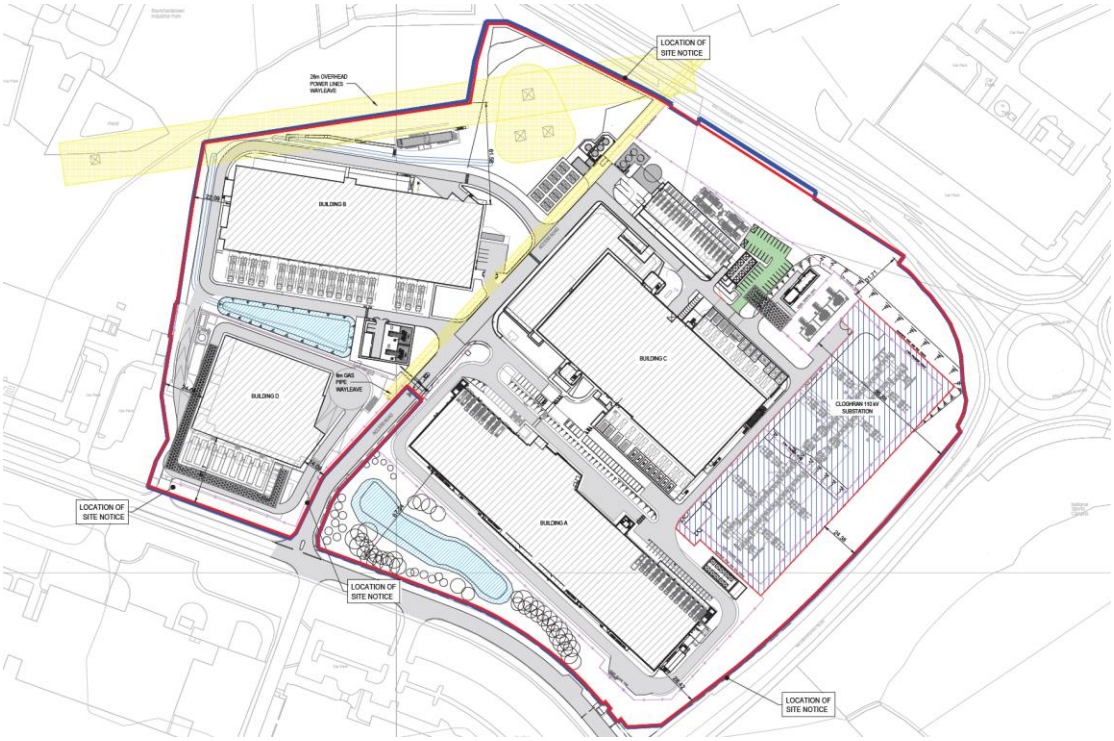


Figure 1 Site Location & Context

Section 6.11.2.1 of the IEL associated with the site calls for the development and provision of a Noise Management Plan (NMP) within two months of the date of the grant of the licence. This NMP details the methods by which the operator will systematically assess, reduce and prevent noise emissions from the site, in accordance with the requirements of the EPA and the issued IEL.

Whilst reasonable effort has been made to ensure that this NMP is easy to understand, it is necessarily technical in nature. To assist the reader, a glossary of terminology is provided in Appendix A.

In line with the IED licence Item 6.11.2.7 this NMP will be reviewed annually following completion of the annual noise monitoring that is a requirement of IEL Item 6.11.1 or in the event of the receipt of a valid noise complaint.

2.0 REVIEW OF IED LICENCE

The following are the relevant sections of the IED licence associated with the site:

Section 4.5 of the document states the following:

"4.5 Noise

Noise from the installation shall not give rise to sound pressure levels measured at the noise sensitive locations (NSLs) which exceed the limit value(s) set out in Schedule 84 Noise Emissions of this licence."

Section 6.11 of the document states the following:

"6.11 Noise

6.11.1 The licensee shall carry out a noise survey of the site operations annually. The survey programme shall be undertaken in accordance with the methodology specified in the 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' as published by the Agency.

6.11.2 Noise Management Plan

6.11.2.1 The licensee shall prepare, maintain and implement, to the satisfaction of the Agency, a Noise Management Plan.

6.11.2.2 The plan shall be submitted within two months of the date of grant of this licence.

6.11.2.3 The plan shall outline noise reduction and abatement measures.

6.11.2.4 The plan to reduce noise emissions should include the following mitigation measure(s): abatement and enclosure of operations, processes and equipment which might give rise to exceedances of noise limit values at the noise-sensitive locations.

6.11.2.5 The plan shall be prepared in accordance with the Agency's Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

6.11.2.6 The plan shall be implemented within six months of the date of grant of this licence.

6.11.2.7 The plan shall be reviewed annually.

Schedule B.4 of the licence states the following:

B.4 Noise Emissions

Daytime dB $L_{Ar,T}$ (30 minutes)	*Evening time dB $L_{Ar,T}$ (30 minutes)*	*Night-time dB $L_{Aeq,T}$ (15 minutes) Note 1*
55	*50*	*45*

Note 1: *During night time hours, there shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise-sensitive location.*

Schedule C4 of the licence states the following:

C.4 Noise Monitoring

Period	*Minimum Survey Duration*
Daytime	*A minimum of 3 sampling periods at each noise monitoring location Note 1*
Evening-time	*A minimum of 1 sampling period at each noise monitoring location*
Night-time Note 2	*A minimum of 2 sampling periods at each noise monitoring location.*

Note 1: *Sampling period is to be the time period stated as per Schedule B.4 Noise Emissions of this licence. This applies to day, evening and night time periods.*

Note 2: *Night-time measurements should be made between 2300 and 0400hrs, Sunday to Thursday, with 2300hrs being the preferred start time.*

The full suite of standby generators is designed to be used in emergency situations, for example, when grid power supplies fail. It is common practice to allow a relaxation of noise limits associated with emergency plant operations. Section 4.4.1 of EPA NG4 contains the following comments in relation to emergency plant items:

> *"In some instances, licensed sites will have certain items of emergency equipment (e.g. standby generators) that will only operate in urgent situations (e.g. grid power failure). Depending upon the context, it may be deemed permissible for such items of equipment to give rise to exceedances in the noise criteria/limits during limited testing and emergency operation only. If such equipment is in regular use for any purposes other than intermittent testing, it is subject to the standard limit values for the site".*

It is therefore considered that the proposed noise criterion of 55dB $L_{Aeq,(15mins)}$ is appropriate in emergency scenarios for daytime, evening and night-time periods.

3.0 OBJECTIVES & STATUS

3.1 Objectives

This NMP serves to aid the decision-making process on the choice of controls, general site design, and operational practice in line with current industry best practice. The NMP is a working document with the specific aim of ensuring:

- noise impact is considered as part of routine operations;
- the minimisation of the risk of unplanned '*noisy'* events that could result in offsite complaints;
- noise is primarily controlled at source by good operational practices, the correct use and maintenance of plant, and operator training, and;
- '*all appropriate measures'* are taken to prevent or, where that is not reasonably practicable, to minimise noise emanating from the facility.

The following strategy will be adopted in terms of the implementation of the NMP developed for this site.

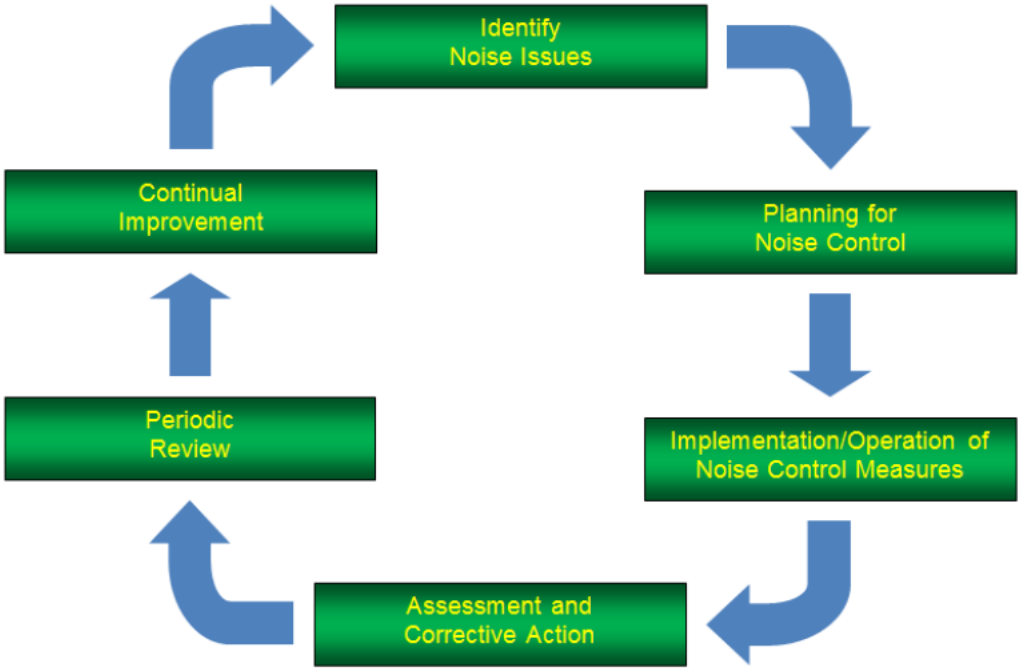


Figure 2 Noise Management Flow Chart (Source: EPA NG4)

3.2 Status

This NMP is a controlled document, and forms part of the overall environmental management of the site.

The specification for the periodic review and update of this plan is set out within the relevant IEL and will be on an annual basis, as a minimum.

However, this plan should be reviewed as required should the following occur:

- significant changes are made to the plant or operational practices;
- the EPA requests that the NMP is updated, in their role as regulator, or;
- complaints are received, which on subsequent investigation result in the identification of further control measures or remedial action, in addition to those set out within this NMP.

4.0 SITE SETTING & BACKGROUND

4.1 Site Description

The Installation is located on a site of 13.08 ha within the Blanchardstown IDA Business and Technology Park. The Site is bounded by the Ballycoolin Road to the north-east, and Snugborough road to the south-east. The Installation is accessed via the Blanchardstown Business and Technology Park access road to the south. The overall site is located between the N2 and N3 national primary roads, outside of the M50.

The lands in the immediate vicinity surrounding the industrial park comprise of predominantly commercial and institutional development, including pharmaceutical, data centres, food manufacturing, warehousing and logistics, and offices uses. Rosemount Business Park is located to the east, with the heavy industry further to the east including the Huntstown Quarry and Huntstown Power station (IE Ref: P0483 and P0777 and Anaerobic Digester facility (IE Ref: P0993). There are 2 no. residential properties located approximately 60 m to the north of the Installation.

Located within the Blanchardstown IDA Business and Technology Park is Ipsen Manufacturing Ireland Ltd, (IE License ref: P0117-02), located immediately to the west of The Site. Ipsen produces generic tableted pharmaceutical products. 550 meters (m) to the west of the Installation is the Equinix Hyperscale 1 (DB5) Limited, a Data Centre campus that is has IE licence currently under consideration by the EPA (IE Ref: P1168-01). The Jellybean factory (food production) is located adjacent to the southwest boundary, and a number of technology business, including software and data storage are located to the north of The Site. Inna labs a specialised engineering and manufacturing business, Securispeed, a logistics business and Edwards Technology Centre, a vacuum and abatement technology business, are located immediately to the south of the campus.

Within the Ballycoolin IDA Business Park, 450 m to the north is K2 Strategic Infrastructure Ireland Limited a Data Centre campus that is has IE licence currently under consideration by the EPA (IE Ref: P1143-01).

To the north and north west of the Installation are 3 IE Licenced pharmaceutical facilities within the College Business and Technology Park; which includes Alexion Pharma International Operations Unlimited Company (IE Ref: P0552); Swords Laboratories Unlimited Company Trading As Bristol Myers Squibb Cruiserath Biologics (IE Ref P1030); and Mallinckrodt Pharmaceuticals Ireland Limited IE Ref: P1060).

The area to the west and south of The Site generally comprise residential areas (Corduff), and educational and recreational facilities with areas of open space and parks. Specifically, this area includes Technological University Dublin Blanchardstown Campus, Riversdale Community College, and Saint Patricks Senior School, as well as the Sport Ireland National Campus located to the of The Site which houses a wide range of Sport Ireland facilities.

4.2 Site Activities

4.2.1 Primary Processes/Activities

The Installation is supported by emergency back-up generators that are located in the generator compound associated with each data storage building. These generators provide the necessary power to ensure the data centre buildings continue

to operate in the event of a temporary failure of electricity supply. An uninterruptible power source or UPS (battery) system is provided for the short-term transition from mains power to the emergency back-up generators.

Data storage buildings B and D are accompanied by a designated generator compound. There is no interconnectivity between the generators of different buildings. B Building A and Building C generators are located in a dedicated generator building.

The individual generators are housed within a container with various designed control measures in place including acoustic attenuation, exhaust silences.

4.2.2 Secondary Process/Activities

Ancillary infrastructure

There are integrated administration areas, associated with each main data hall building. The administration areas comprise the following main components:

- Reception areas;
- Open office areas, and conference rooms/meeting rooms;
- Maintenance and storage spaces, and;
- Break room and sanitary facilities.

Additional Ancillary infrastructure includes:

- Underground foul and storm water drainage network,
- utility ducts and cables,
- Internal road network an. car and motorcycle parking spaces. sheltered bicycle parking spaces,
- security hut and security fencing; and
- Drainage infrastructure including 2 no. attenuation basins and 2 no. underground attenuation systems.

Data Hall Cooling Systems

The location of the facilities in Ireland allows for the use of free-cooling media without the need for mechanical cooling. To take advantage of this, the air handling equipment will be fitted with airside condensers to utilise this outdoor air to cool the space.

The cooling units or Air Handling Units (AHUs) provide conditioned air to maintain temperature, relative humidity and pressurisation in the data halls. The cooling units under 2 modes; Free Cooling and Evaporative Cooling: Free Cooling uses outside air and Evaporative Cooling mode or ‘Adiabatic Cooling’ uses water from the mains supply as the cooling media. Duty and standby units are in place to ensure cooling is available at all times.

Waste Heat Recovery

The cooling system design for Building D can accommodate the future Installation of heat recovery coils in the central ventilation plant. If incorporated, the heat recovery coils would remove heat from the air after it passes through the data storage rooms to a hydraulic (water) pipe network before the air is re-introduced to the data storage room or exhausted to the atmosphere.

The heat recovery coils could generate hydraulic temperatures of between 20-30°C at the point of recovery.

The above provision could supply heat energy to a future district heating scheme developed by others external to The Site boundary. It should be noted that in order to benefit from the above heat recovery that district heating infrastructure external to The Site including plate heat exchangers, pumps and distribution networks would need to be developed by others.

4.2.3 Electricity Supply and 110kV Substation

The power requirements for the Installation are provided via a direct connection to the Air Insulated Switchgear (AIS) 110 kV Substation located in the east of The Site that was consented under FW11A/0104.

The AIS system was approved by EirGrid to allow for EirGrid and ESB Networks requirements for 100% expansion which will allow for future development for users within the industrially zoned lands. ESB Networks are the Transmission Asset Owner (TAO). ESB Networks is a subsidiary within ESB Group. ESB Networks finances, builds, and maintains the transmission system through which electricity flows from generation stations to bulk supply points near Ireland's cities and towns. It does this under a TAO licence granted by the Commission for Regulation of Utilities (CRU). ESB Networks performs its transmission related functions under the direction of Eirgrid. In summary EirGrid operates the transmission system (TSO) while ESB Networks carries out construction, maintenance, and repairs (TAO) under the direction of EirGrid. For this development, EirGrid will operate and the AIS Substation, remotely from their control centres. However, ESB Networks will carry out all local operations on Eirgrid's behalf. Eirgird and ESB Networks are committed to running their businesses in the most environmentally friendly way possible.

There is a transformer compound containing 3 no. transformers and associated control building to the north the AIS Substation owned and operated by ADSIL, anda second transformer compound containing 2 no. transformers and associated control building located between Building B and Building C owned and operated by ADSIL.

In addition to the mains connection, there is an array of PV panels on Building D which can generate on site renewable energy up to a peak of 9.6 kWe. The on-site renewable electricity generation will be back-fed to the electrical general supply for the building, serving lighting, office area general services and office IT equipment.

4.3 Operational Noise

In terms of day to day operations associated with the site, the significant noise sources of note relate to the data hall cooling systems as outlined in Section 4.2.

As part of maintenance programmes, emergency generators associated with the site are tested on scheduled basis. This typically consists of 2 units being tested at any one time. This scheduled generator testing takes place during daytime hours only.

In, the event of an emergency (e.g. loss of grid power to the site), all generators associated with the site will operate.

During operation, the primary source of noise is expected to arise from building service plant which will be required to service the data storage facilities (i.e. the AHU air intake and the AHU air exhaust) as well as the operation of the emergency back-

up generators during testing and emergency scenarios (i.e. generator air intake, generator air exhaust and generator engine exhaust).

Each emergency generator is contained within an acoustic container to reduce the noise breakout, and in-line attenuators for the generator stacks and exhausts are used where necessary to comply with environmental noise criteria.

It is anticipated that the noise abatement measures are sufficient to ensure that the noise levels comply with the daytime, evening and night-time noise limits to be stipulated in the relevant IEL at the nearest noise sensitive receptors as outlined in Section 2.0. Annual day time, evening and night-time monitoring will be undertaken in accordance with the IEL requirements.

4.4 Noise Monitoring Locations

Attachment 7.5 of the Licence application identified the following noise monitoring locations (as shown on Figure 3):

Monitoring Point Code	Easting	Northing	Monitoring Point Type
A	708,762	740,755	Noise Sensitive Location
B	708,484	740,132	
C	709,489	740,178	

Table 1 Noise Monitoring Locations



Figure 3 Noise Monitoring Locations

5.0 COMPLIANCE MANAGEMENT

5.1 Annual Noise Monitoring

In line with the requirements of Section 6.11.1 of the IEL, annual noise monitoring will be completed at the monitoring locations detailed in Section 4.4 and as shown on Figure 3. Monitoring will be carried out to satisfy the minimum survey duration detailed in Section C.4 of the IEL.

At the time of the preparation of this initial iteration of this NMP the annual noise monitoring has not been completed. Subsequent iterations of this NMP will include a review of the findings of annual noise surveys carried out in order to satisfy Section 6.11.1 of the IEL.

5.2 Assessment of Specific Noise

A requirement of the EPA NG4[1] document is that specific noise levels at noise sensitive locations be measured and/or estimated as part of an annual noise monitoring report. The following methodology will be adopted to complete this aspect of the assessment:

Description of Site Noise		Noise Parameter that Best Represents Specific Noise from Site
Category	Subjective Impression	
A	Site noise dominant, no other significant noise sources noted.	$L_{Aeq,T}$
B	Intermittent noise from other sources (e.g. traffic, birds, wind), with underlying site noise audible.	$L_{A90,T}$ if frequent interfering noise and site noise is audible in lulls. Or $L_{A50,T}$ if site noise is clearly audible (steady of variable), with occasional interference from other sources.
C	Plant barely audible (i.e. not immediately noticeable, unless actively listening)	$<L_{A90,T}$ (i.e. specific plant noise is up to 5dB lower than measured $L_{A90,T}$)
D	Plant not audible	Not Detected, ND $<<L_{A90,T}$ (more than 5dB lower than $L_{A90,T}$)

Table 2 Methodology for Determination of Site-Specific Noise

5.3 Review of Site Noise Sources

Note the following excerpt from the EPA NG4 document:

"As a general guide, a Noise Management Programme will typically not be required if:

- *Noise emissions attributable to the facility are in full compliance with the relevant site-specific limits;*
- *The site-specific noise is broadband in nature, i.e. there is a complete absence of tonal and impulsive noise, as determined by subjective and objective assessment, at the facility's site boundary and NSL's, and;*
- *There is no history of noise complaints from nearby sensitive receptors."*

If, following completing of the initial annual noise monitoring survey it is concluded that the relevant noise limits assigned to the site are being exceeded a schedule of

[1] *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2016)*

remedial measures and works will be developed in order to reduce and abate the noise impacts.

Alternatively, if, following completion of the initial annual noise monitoring survey it is concluded that the site is operating within the various noise criteria outlined in Section 2.0, it is not proposed to implement further noise reduction measures other than those considered to date on site as part of detailed design and ongoing management of the site at the time of preparation of this iteration of the NMP.

A 3D site noise model was prepared as part of the planning application and IED application process. Based on the current iterations of this model, as reported to the Agency as part of the IEL application process, modelling indicates that the various noise criteria outlined in Section 2.0 of this report are not being exceeded and are broadband in nature. The intent of Figure 4 will be followed in determining if a detailed suite of noise reduction measures needs to be developed for the site.

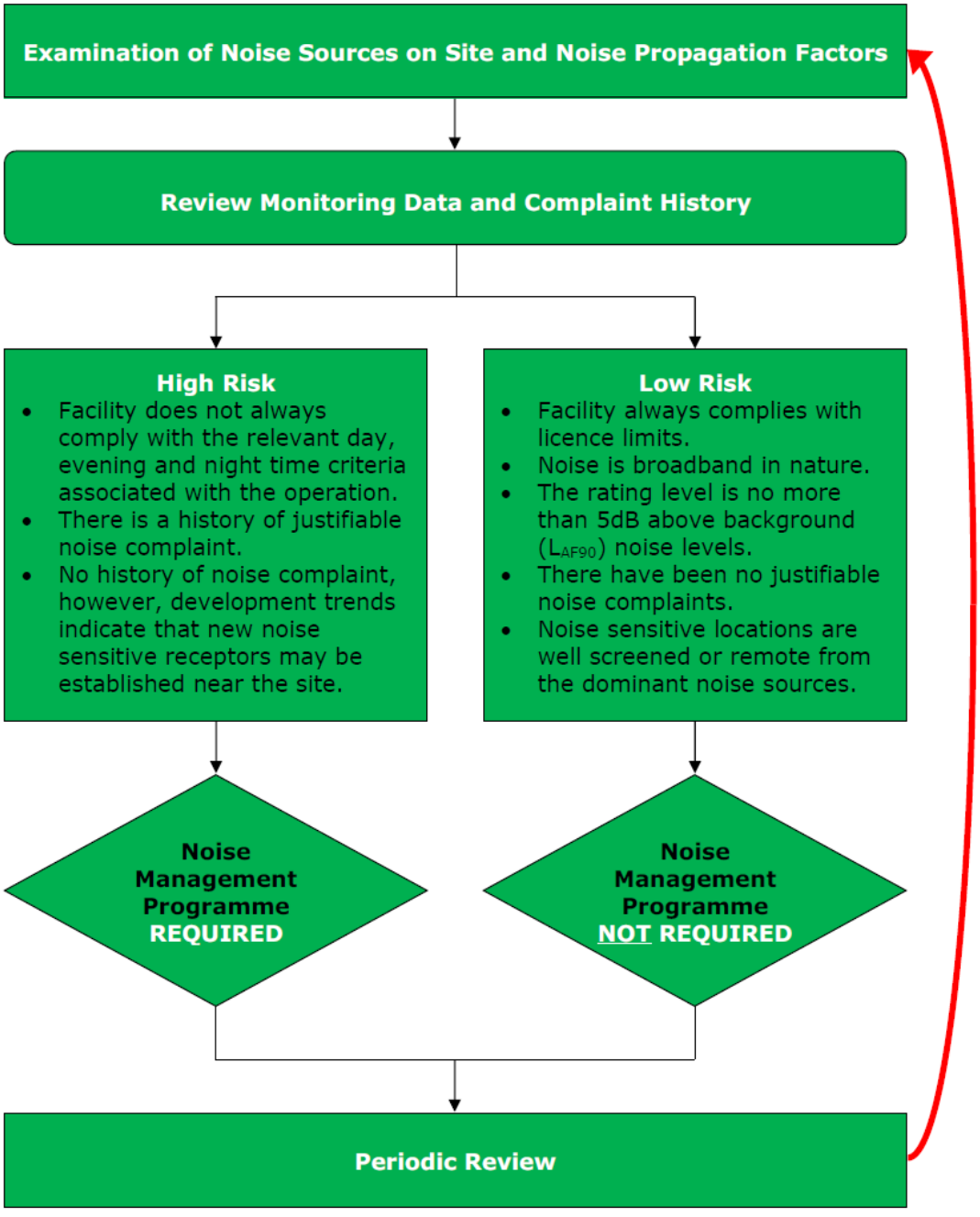


Figure 4 Factors to Consider in the Development of an NMP (Source: EPA NG4)

5.4 Complaint Process

If a complaint is received from a local resident or the EPA, an investigation shall be instigated within one working day and in accordance with the Operator's documented Environmental Management System to identify the cause of the non-compliance / complaint and a Noise Complaint Investigation Form (see Appendix B) will be filled in and appropriate action will be taken to remedy the problem should the complaint be validated.

Once a complaint has been made to a licensee, a detailed record of all pertinent information should be logged by the licensee, including:

- Name and address of complainant;
- Time and date complaint was made;
- Date, time and duration of noise and characteristics e.g. rumble, clatters, intermittent screeching, etc.;
- Details on whether neighbours or other family members have heard the noise;
- Likely cause or source of the noise;
- Weather conditions, in particular wind speed and direction (for intermittent noise sources, especially when the NSL is a considerable distance from the offending noise source, meteorological conditions can be a determining factor), and;
- Investigative and follow-up action arising from the complaint.

A complaint investigation may involve the identification and cessation of the activity or activities considered to be the cause of the non-compliance/complaint and/or the investigation of mitigation measures to reduce the noise emission levels from the activity or activities; for example, the replacement of noisy plant with quieter alternatives and/or the use of temporary screening mounds.

Any deviation from agreed working practices shall be identified immediately and conformance to the working practice reinstated.

If it is not possible to identify the source of the complaint it may be necessary to undertake a noise survey. If this is needed a suitably qualified person should be employed to undertake the required survey work. The date and results of the noise survey should be logged and reported in accordance with the relevant good practice measures.

6.0 CONCLUSIONS

Amazon Data Services Ireland Limited operate a facility in the IDA Blanchardstown Business and Technology Park, Ballycoolin Road and Snugborough Road, Blanchardstown, Dublin 15 that operates under an Industrial Emissions Licence (IEL) (Licence Register Number: P1172-01) as issued by the Environmental Protection Agency (EPA).

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Section 6.11.2.1 of the IEL associated with the site calls for the development and provision of a Noise Management Plan (NMP) within two months of the date of the grant of the licence.

This NMP details the methods by which the operator will systematically assess, reduce and prevent noise emissions from the site, in accordance with the requirements of the EPA and the issued IEL in line with the guidance contained in *'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' (2016)* as published by the Agency.

In line with the IEL Item 6.11.2.7 this NMP will be reviewed annually following completion of the annual noise monitoring that is a requirement of IEL Item 6.11.1 or in the event of the receipt of a valid noise complaint.

APPENDIX A
GLOSSARY OF ACOUSTIC TERMINOLOGY

ambient noise — The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.

background noise — The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).

broadband — Sounds that contain energy distributed across a wide range of frequencies.

dB — Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μPa).

dB L_{pA} — An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'–weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

Hertz (Hz) — The unit of sound frequency in cycles per second.

impulsive noise — A noise that is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

$L_{Aeq,T}$ — This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.

L_{AFN} — The A-weighted noise level exceeded for N% of the sampling interval. Measured using the "Fast" time weighting.

L_{AFmax} — is the instantaneous slow time weighted maximum sound level measured during the sample period (usually referred to in relation to construction noise levels).

$L_{Ar,T}$ — The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and impulsiveness of the sound.

L_{AF90} — Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.

APPENDIX A
GLOSSARY OF ACOUSTIC TERMINOLOGY (Continued)

low frequency noise — LFN - noise which is dominated by frequency components towards the lower end of the frequency spectrum.

noise — Any sound, that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it, is known as noise.

noise sensitive location — NSL – Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

octave band — A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.

rating level — See $L_{Ar,T}$.

sound power level — The logarithmic measure of sound power in comparison to a referenced sound intensity level of one picowatt (1pW) per m^2 where:

$$Lw = 10Log\frac{P}{P_0}\ \text{dB}$$

Where: p is the rms value of sound power in pascals; and
P_0 is 1 pW.

sound pressure level — The sound pressure level at a point is defined as:

$$Lp = 20Log\frac{P}{P_0}\ \text{dB}$$

specific noise level — A component of the ambient noise which can be specifically identified by acoustical means and may be associated with a specific source. In BS 4142, there is a more precise definition as follows: 'the equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval ($L_{Aeq,\,T}$)'.

tonal — Sounds which cover a range of only a few Hz which contains a clearly audible tone i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being 'tonal'.

$^1/_3$ octave analysis — Frequency analysis of sound such that the frequency spectrum is subdivided into bands of one–third of an octave each.

APPENDIX B
NOISE COMPLAINT INVESTIGATION FORM

Site Details				
Site Name				
Licence Reg. No.				
Recording of a Complaint				
Date and time of complaint	Date:		Time:	
Assign reference number to complaint				
Complainant's name, address and contact details	Name:			
	Address:			
	Contact Details:			
Class of noise complaint (i.e. residential, commercial, industrial or other)	Residential ☐	Commercial ☐	Industrial ☐	Other ☐
Has the person complained about the noise before (Yes or No)	Yes ☐		No ☐	
Complainant's description of noise source (e.g. vehicle noise, building services plant, voices etc.)				
Description of frequency and time periods of noise source (i.e. continuous, intermittent, day or night-time)				

Complaint Investigation				
Investigation carried out by				
Position				
Date and time	Date:		Time:	
Does the investigation period correspond to that of the complaint (Yes or No)	Yes ☐		No ☐	
Describe assessment location, sketch map where appropriate				
Does the assessment location correspond to the location of the complaint (Yes or No)	Yes ☐		No ☐	
Note meteorological conditions (approximate wind speed, direction, precipitation, cloud cover and temperature)	Wind Speed (m/s):		Cloud Cover (%):	
	Precipitation:	Yes ☐ No ☐	Temperature (°C):	
Describe overall noise climate, note all primary contributors to noise build up				

Period of observation (should be a minimum of 5 minutes at each location)				
Volume descriptor for source of noise complaint (tick box)	0 = not audible ☐	1 = barely audible ☐	2 = easily noticeable ☐	3 = loud ☐
Characteristics of noise source in Question (e.g. continuous, intermittent, potentially tonal or impulsive characteristics etc.)	Continuous ☐	Intermittent ☐	Tonal ☐	Impulsive ☐
	Subjective impression of noise source in question:			
Summary of conclusion reached:				
Is additional investigation and/or noise monitoring required (Yes or No)	Yes ☐		No ☐	
Should additional advice be sought from appropriate expert (Yes or No)	Yes ☐		No ☐	
Reporting and Correspondence				
Date of response	Date:			
Response method (e.g. letter, telephone, email, home visit etc.)	Letter ☐	Telephone ☐	Email ☐	Home Visit ☐
Response reference				
Summary of response				
Additional actions				
Additional correspondence				