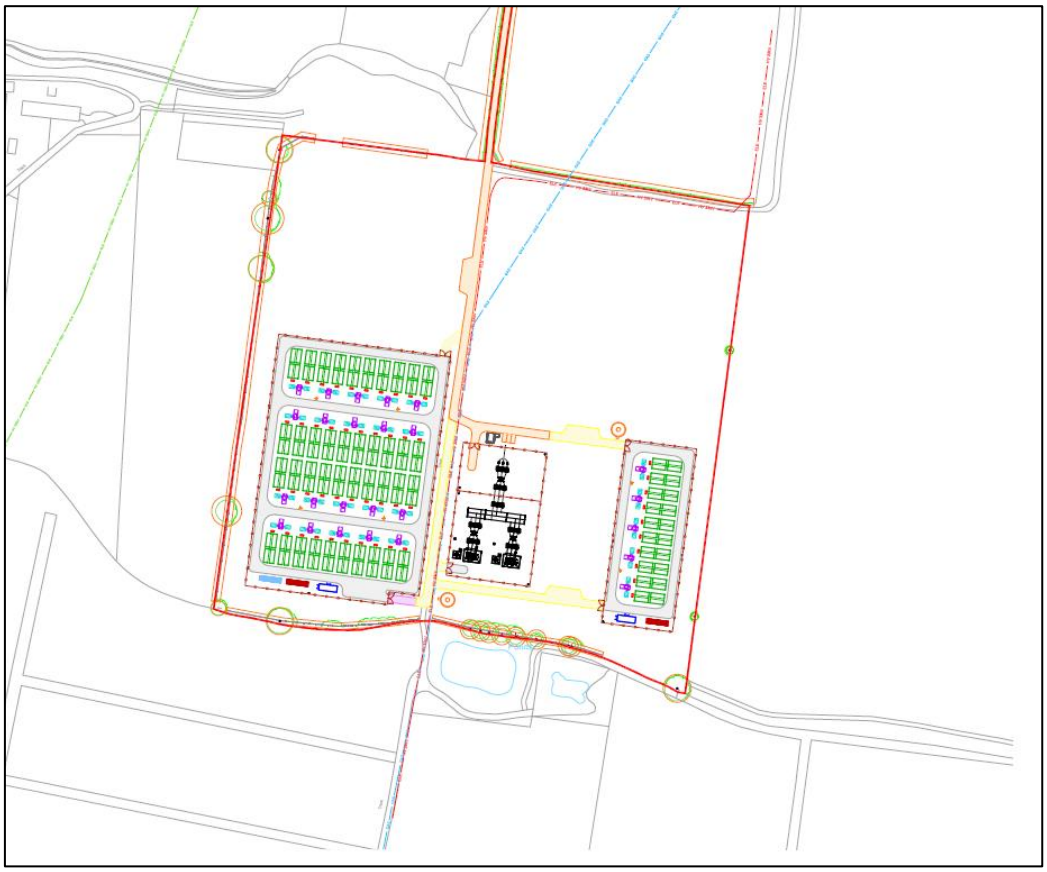
North Cray Road ESS, Sidcup

784-B070946



Noise Impact Assessment

DWD Property and Planning Limited

March 2025

TETRA TECH

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Acronyms/Abbreviations

Acronyms/Abbreviations	Definition
CADNA	Computer Aided Noise Abatement
DMRB	Design Manual for Roads and Bridges
HGV	Heavy Goods Vehicle
PPG	Planning Practice Guidance
UDP	Unitary Development Plan
UKAS	United Kingdom Accreditation Service

Executive Summary

A noise assessment has been undertaken in support of a planning application for a 200MW Energy Storage System (ESS) facility on land at North Cray Road, Sidcup, DA14 5HE.

A baseline noise survey was undertaken in January/February 2025 to establish the existing background noise levels (L_{A90}) and ambient noise levels ($L_{Aeq,T}$) at the surrounding existing sensitive receptors during the daytime and night-time periods.

CadnaA noise modelling software has been used to model predicted noise emissions from the site using the ISO 9613-2 noise propagation methodology at the closest sensitive receptors.

The BS 4142:2014 noise rating levels at the nearest noise sensitive receptors, inclusive of all noise emitting plant associated with the development, are below the daytime background noise levels at all receptors and exceed the existing night-time background noise levels by up +3 dB at two receptors. In accordance with BS 4142:2014+A1:2019, this is an indication of a low impact.

Furthermore, predicted noise levels from the operation of the proposed development were assessed separately against the BS 8233/WHO internal noise level criteria for dwellings. The predicted noise levels fall below the criteria during the daytime period (L_{Aeq} (07:00-23:00) and night-time period (L_{Aeq} 23:00-07:00) with windows open at all receptors.

Further context was provided by comparing the existing ambient noise L_{Aeq} to the predicted ambient noise levels associated with the proposed development. The change in ambient noise levels show that the short-term impact would be negligible during daytime period and the night-time period in accordance with IEMA 2014 guidelines.

It has been predicted that on-site operational noise effects associated with the proposed development result in a Lowest Observed Adverse Effect Level (LOAEL) or lower, and therefore the development will have a low impact in relation to noise.

1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise assessment undertaken in support of a planning application for a 200MW Energy Storage System (ESS) facility on land at North Cray Road, Sidcup, DA14 5HE.

The Proposed Development will consist of ESS units, a substation and associated electrical equipment, drainage, access, landscaping, underground cable route, fencing and other ancillary infrastructure.

A description of the existing noise environment in and around the site is provided. Noise surveys have been undertaken and the results used to predict the potential noise impact of the proposed development on the existing noise sensitive receptors.

A list of acoustic terminology used in this report is provided in Appendix A.

1.2 Legislative Context

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in the National Planning Policy Framework (NPPF), published in December 2024. With regard to noise and planning, the NPPF contains the following statement at Paragraph 198:

> "198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:
>
> (a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
>
> (b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason […]

> "200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.
>
> "201. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

Planning Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England (NPSE), is to **"identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation."**

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated below in **Table 1.1**.

Table 1.1: NPPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No Specific Measures Required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

The NPPF, NPSE and PPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents including ‘BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings’ (2014) and ‘BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound’ (2014) have been used. Section 2.0 presents the noise level criteria used as a basis of this assessment.

The PPG also states that neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.

Furthermore, the PPG: Noise identifies at Paragraph: 011 Reference ID: 30-011-20190722 the requirement for developments proposals to incorporate measures to mitigating the impact of noise on residential developments. In particular:

"*Noise impacts may be partially offset if residents have access to one or more of:*

- *a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling;*
- *a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects;*
- *a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- *a relatively quiet, protected, external publicly accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance).*

Local & Regional Policy Context

The Bexley Local Plan was adopted by London Borough of Bexley Council in April 2023 to 2038, in line with the principles set out in the Growth Strategy. Tetra Tech has reviewed the Local Plan and identified the following as being relevant to the proposed development in terms of noise.

"**Policy DP31: Energy infrastructure**

7.32 The NPPF states that local planning authorities should design their policies to maximise renewable and low carbon energy development while ensuring that adverse impacts are addressed satisfactorily, including cumulative landscape and visual impacts.

[…]

7.45 Renewable energy schemes will be strongly promoted in the borough and encouraged as part of development proposals where they are effective, viable and practical.

Applications for renewable energy generation will be expected to demonstrate how the proposal has been sensitively designed to integrate into the local environment , minimising any potential negative impacts, both physically and environmentally.

[…]

Policy DP11: Achieving high-quality design

2. Irrespective of location, all development proposals for new buildings, extensions and alterations, conversions, changes of use and public and private spaces will be expected to follow the principles and requirements set out in this document and to:

[…]

e. Ensure that all proposed development and uses do not unacceptably affect residents or occupiers of either the proposed development or of existing neighbouring residents, businesses and community facilities by means of noise, odour, vibration and light spill or other disturbances.

[…]

4.20 Identified impacts should be mitigated through design. The layout, orientation, design and use of buildings will ensure that operational noise does not adversely affect occupants or neighbours, particularly noise-sensitive land uses such as housing, hospitals, schools and quiet open spaces. Where necessary, development is required to robustly demonstrate how conflict with existing uses will be avoided, through mitigation measures."

1.3 Acoustic Consultants' Qualifications and Professional Memberships

The lead project Acoustic Consultant is Joseph Archer. The report has been checked by Joe Nott and verified by Dawit Abraham. Relevant qualifications, membership and experience are summarised in **Table 1.2** below.

Table 1.2: Acoustic Consultants' Qualifications & Experience

Name	Education	Experience in Undertaking Noise Assessments (Start date of working in noise & acoustics)	Attained Associate Membership of the Institute of Acoustics (date)	Attained Membership of the Institute of Acoustics (date)
Joe Nott	BSc 2016	Aug 2016	Aug 2017	-
Joe Archer	BSc 2015 PgDip 2022	Jun 2016	Apr 2018	-
Dawit Abraham	BSc 2008 MSc 2010	Oct 2010	Jan 2011	Jan 2015

2.0 Assessment Criteria

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, **Table 2.1** presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from standards and design guidance:

- BS 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings – Code of practice’
- BS4142:2014 ‘Method for rating industrial and commercial sound’
- World Health Organisations (1999) ‘Guidelines for Community Noise’
- IEMA ‘Guidelines for Environmental Noise Impact Assessment’ (2014)

A full bibliography of documents referenced within this report is provided within Appendix C.

Table 2.1: Noise Level Criteria and Actions

Noise Sources	Noise Level Criteria	Justification for Effect Level- Action Required
No Observed Adverse Effect Level (NOAEL)		
Fixed plant and equipment located externally or internally with louvered ventilation grilles	Difference between Rating Level ($L_{Ar,T}$) dB and existing background level $L_{A90,T}$ dB is less than or equal to 0dB	**Justification for Effect Level:** Below low impact threshold in BS4142:2014 **Action Required:** None
Absolute internal noise criteria for the following noise sources with windows closed: • Road traffic noise • Goods vehicle deliveries and unloading of vehicles. • Service yard noise including forklift truck movements. • Car Parks	Noise levels are below: Living Rooms: - 35 $dBL_{Aeq,16hours}$ Kitchens, Dining Rooms, and Studies: - 40 $dBL_{Aeq,16hours}$ Bedrooms: - 35 $dBL_{Aeq,16hours}$ - 30dB $L_{Aeq,8hr}$ - $L_{AFmax,2min}$ noise levels do not exceed: 45dB L_{AFmax} based on 10th highest $L_{AFmax,2min}$ sample)	**Justification for Effect Level:** Less than threshold values in Table 4 in BS8233:2014 and Table 1 in World Health Organisation (1999) Guidelines on Community Noise **Action Required:** None
Change in noise levels for the following noise sources: • Road traffic noise • Goods vehicle deliveries including arrival and departure of vehicles and unloading of vehicles. • Service yard noise including forklift truck movements. • Car Parks	Increase in ambient $L_{Aeq,T}$ due to contribution from proposed development of ≤1dB.	**Justification for Effect Level:** Within negligible short-term impact classification range in Table 7.14 in IEMA 2014 guidance Guidelines for Environmental Noise Impact Assessment **Action Required:** None
Lowest Observed Adverse Effect Level (LOAEL)		
Fixed plant and equipment located externally or internally with louvered ventilation grilles	Difference between Rating Level ($L_{Ar,T}$) dB and existing background sound level $L_{A90,T}$ dB is between 1-4dB.	**Justification for Effect Level:** Lower rating levels relative to measured background indicate it is less likely for adverse impacts to occur (depending on context). **Action Required:** Reduce to a minimum the exceedance over 0dB above background threshold through good acoustic design where practicable, or demonstrate contextual reasoning as to why adverse effects are not predicted
Absolute internal noise criteria for the following noise sources with windows closed: • Road traffic noise • Goods vehicle deliveries and unloading of vehicles. • Service yard noise including forklift truck movements.	Noise levels are between: Living Rooms: - 35-40 $dBL_{Aeq,16hours}$ Kitchens, Dining Rooms, and Studies: - 40-45 $dBL_{Aeq,16hours}$ Bedrooms: - 35-40 $dBL_{Aeq,16hours}$	**Justification for Effect Level:** Exceed threshold guidelines in Table 4 of BS8233:2014 and World Health Organisation (1999) Guidelines on Community Noise by no greater than 5dB to achieve reasonable internal conditions as

• Car Parks	- 30-35dB $L_{Aeq,8hr}$ - $L_{AFmax,2min}$ noise levels do not exceed 45dB L_{AFmax} based on 10th highest $L_{AFmax,2min}$ sample)	defined by Note 7 to Table 1 in BS8233:2014 **Action Required:** Mitigate and reduce to a minimum the exceedance over the threshold
Change in noise levels for the following noise sources: • Road traffic noise • Goods vehicle deliveries including arrival and departure of vehicles and unloading of vehicles. • Service yard noise including forklift truck movements. • Car Parks	Increase in ambient $L_{Aeq,T}$ due to contribution from proposed development of 1.0-2.9dB.	**Justification for Effect Level:** Within minor short-term impact classification range in Table 7.14 in IEMA 2014 guidance Guidelines for Environmental Noise Impact Assessment **Action Required:** Additional mitigation required to achieve effect of LOAEL or less.
Significant Observed Adverse Effect Level (SOAEL)		
Fixed plant and equipment located externally or internally with louvered ventilation grilles	Difference between Rating Level ($L_{Ar,T}$) dB and existing background sound level $L_{A90,T}$ dB is between 5-9dB.	**Justification for Effect Level:** Within adverse impact threshold in BS4142:2014. **Action Required** Additional mitigation required to achieve effect of LOAEL or less.
Absolute internal noise criteria for the following noise sources with windows closed: • Road traffic noise • Goods vehicle deliveries and unloading of vehicles. • Service yard noise including forklift truck movements. • Car Parks	Noise levels are between: Living Rooms: - 40-45 dB$L_{Aeq,16hours}$ Kitchens, Dining Rooms, and Studies: - 45-50 dB$L_{Aeq,16hours}$ Bedrooms: - 40-45 dB$L_{Aeq,16hours}$ - 35-40dB $L_{Aeq,8hr}$ - 45-55dB $L_{AFmax,2min}$ based on 10th highest $L_{AFmax,2min}$ sample)	**Justification for Effect Level:** Exceeds BS8233:2014 $L_{Aeq,T}$ reasonable criteria by 5dB or exceeds $L_{AFmax,2min}$ (10th highest sample) **Action Required:** Additional mitigation required to achieve effect of LOAEL or less.
Change in noise levels for the following noise sources: • Road traffic noise • Goods vehicle deliveries including arrival and departure of vehicles and unloading of vehicles. • Service yard noise including forklift truck movements. • Car Parks	Increase in ambient $L_{Aeq,T}$ due to contribution from proposed development of 3.0-4.9dB.	**Justification for Effect Level:** Within moderate short-term impact classification range in Table 7.14 in IEMA 2014 guidance Guidelines for Environmental Noise Impact Assessment **Action Required:** Additional mitigation required to achieve effect of LOAEL or less.
Unacceptable Observed Adverse Effect Level (UOAEL)		
Fixed plant and equipment located externally or internally with louvered ventilation grilles	Difference between Rating Level ($L_{Ar,T}$) dB and existing background sound level $L_{A90,T}$ dB is equal to or greater than 10dB	**Justification for Effect Level:** Within significant adverse impact threshold in BS4142:2014 **Action Required:** Additional mitigation required to achieve effect of LOAEL or less.

Absolute internal noise criteria for the following noise sources with windows closed: • Road traffic noise • Goods vehicle deliveries and unloading of vehicles. • Service yard noise including forklift truck movements. • Car Parks	Noise levels exceed: Living Rooms: - 45 dB$L_{Aeq,16hours}$ Kitchens, Dining Rooms, and Studies: - 50 dB$L_{Aeq,16hours}$ Bedrooms: - 45 dB$L_{Aeq,16hours}$ - 40dB $L_{Aeq,8hr}$ - $L_{AFmax,2min}$ noise levels exceeds 55dB L_{AFmax} based on 10th highest $L_{AFmax,2min}$ sample)	**Justification for Effect Level:** Exceeds BS8233:2014 $L_{Aeq,T}$ reasonable criteria by 10dB or exceeds $L_{AFmax,2min}$ (10th highest sample) by 10dB or more. **Action Required:** Additional mitigation required to achieve effect of LOAEL or less.
Change in noise levels for the following noise sources: • Road traffic noise • Goods vehicle deliveries including arrival and departure of vehicles and unloading of vehicles. • Service yard noise including forklift truck movements. • Car Parks	Increase in ambient $L_{Aeq,T}$ due to contribution from proposed development of ≥5.0dB.	**Justification for Effect Level:** Within major short-term impact classification range in Table 7.14 in IEMA 2014 guidance Guidelines for Environmental Noise Impact Assessment. **Action Required:** Additional mitigation required to achieve effect of LOAEL or less.

3.0 Noise Survey

3.1 Noise Survey Details

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels. Equipment used during the survey included:

Rion NL52	Environmental Noise Analyser	s/n	1176464
Rion NL52	Environmental Noise Analyser	s/n	710313
Rion NC75	Sound Calibrator	s/n	35046823

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice, a drift of +0.1 dB was observed on meter s/n 710313 and no drift was observed on meter s/n 1176464. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

A long-term unattended baseline monitoring survey was undertaken at two locations (as specified in **Table 3.1** and shown in **Figure 3.1** below) from Thursday 30th January 2025 to Wednesday 5th February 2025 over a 143-hour period. The raw data collected from the long-term monitoring is available upon request.

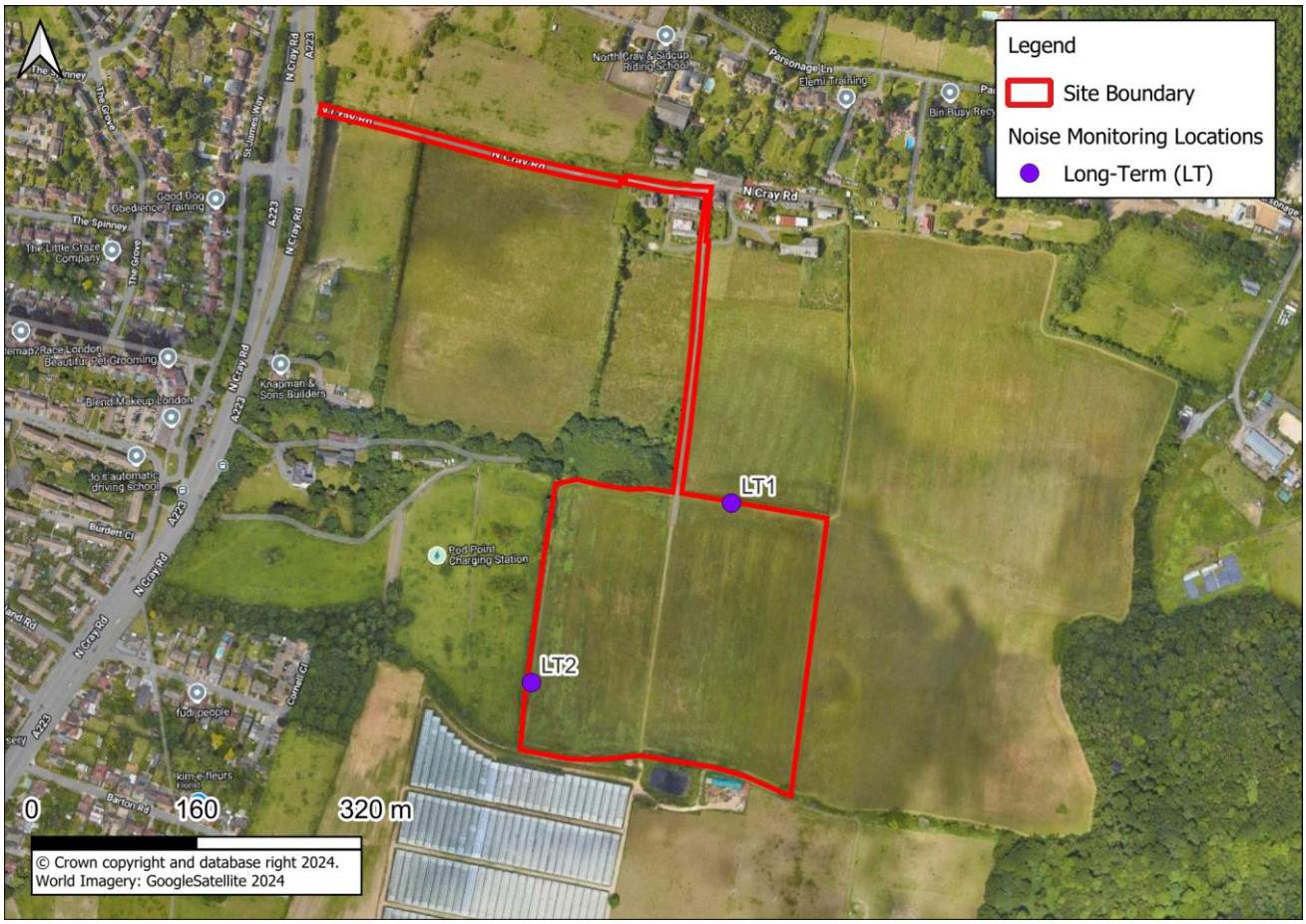
Measurements were taken in general accordance with BS 7445-1:2003 The Description and Measurement of Environmental Noise: Guide to quantities and procedures. Weather conditions during the survey period were observed as being dry. Anemometer readings confirmed that wind speeds were less than 5 ms^{-1} at all times during site attendance, with a predominantly southwestern wind direction.

Available online weather data from wunderground.com (weather station ID: IBEXLE9, approximately 3km from the development site), confirmed that the survey period remained predominantly dry, with some light precipitation noted in the early hours of Friday 31st January. Average wind speeds were noted to be less than 5 ms^{-1} throughout the duration of the survey. Temperatures were noted to range between 1˚C and 15˚C during the survey.

Table 3.1: Noise Monitoring Locations

Location	Description
LT1	Located centrally along the northern site boundary, considered representative of residential receptors to the north, 1.5m above ground.
LT2	Located along the western site boundary, considered representative of residential receptors to the west, 1.5m above ground.

Figure 3.1: Noise Monitoring Locations



3.2 Noise Survey Results

The dominant noise sources found in the area included road traffic noise from the surrounding road network. At both monitoring locations LT1 it was noted that a consistent flow of traffic from N Cray Road (A223) to the west was the dominant noise source. In the lulls of road traffic noise, contributions to the noise climate from birdsong, livestock in nearby fields and rustling of leaves/general foliage were noted at both monitoring locations. Occasional aircraft movements were also noted whilst in site attendance.

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. For the long-term (LT) locations, the presented $L_{Aeq,T}$ are average noise

levels whilst the L_{A90} is the modal noise level of each 15-minute measurement over the stated survey period.

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2 x 10^{-5} Pa).

Table 3.2: Results of Baseline Noise Monitoring Survey

Period	Duration (T)	Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekday Daytime 07:00 - 23:00	59 Hours	11:43 (30/01/2025) – 11:13 (05/02/2025)	LT1	50.2	73.4	34.7	50.8	50.0
Weekday Night-time 23:00 – 07:00	32 Hours	23:00 (30/01/2025) – 06:45 (05/02/2025)		46.1	81.9	28.5	45.3	38.0
Weekend Daytime 07:00 - 23:00	32 Hours	07:00 (01/02/2025) – 22:45 (02/02/2025)		48.8	80.7	40.6	49.9	46.0
Weekend Night-time 23:00 – 07:00	16 Hours	00:00 (01/02/2025) – 23:45 (02/02/2025)		46.4	64.4	30.6	46.8	40.0
Weekday Daytime 07:00 - 23:00	59 Hours	12:08 (30/01/2025) – 11:08 (05/02/2025)	LT2	49.6	83.2	35.4	50.1	48.0
Weekday Night-time 23:00 – 07:00	32 Hours	23:00 (30/01/2025) – 06:45 (05/02/2025)		46.1	86.1	27.4	44.3	36.0
Weekend Daytime 07:00 - 23:00	32 Hours	07:00 (01/02/2025) – 22:45 (02/02/2025)		48.6	72.7	39.1	49.7	46.0
Weekend Night-time 23:00 – 07:00	16 Hours	00:00 (01/02/2025) – 23:45 (02/02/2025)		46.8	86.8	29.0	46.5	37.0

All values are sound pressure levels in dB re: 2 x 10^{-5} Pa.

4.0 Assessment Methodology

4.1 Noise Modelling Methodology

Three-dimensional noise modelling has been undertaken based on the monitoring data to predict noise levels at a number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on ISO 9613-2 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data and model settings as given in **Table 4.1** below have been used.

Table 4.1: Modelling Parameters Sources and Input Data

Parameter	Source	Details
Horizontal distances around site	OS Open Map	Ordnance Survey
Ground levels around site	DEFRA	LiDAR 1m DTM
Building heights around site	Tetra Tech Observations	• 4.0m height for one-storey properties • 8.0 m height for two storey properties • 3.0m per additional storey
Receptor positions*	Tetra Tech	• 1.5 m for ground floor properties • 4.0m height for first-floor properties • 3.0m per additional storey
Modelling Parameters	Tetra Tech	• Ground Absorption: 0.8 • Order of Reflections: 3 • Noise Contour Plot Grid Receiver Spacing: 10
Proposed Plans	CADmando Design and Draughting Solutions Ltd	Drawing Title: North Cray Road Sidcup ESS Proposed Site Layout Plan Drawing No: FST029-PL02 Rev 04
Source Heights	Manufacturers Data	Energy Storage Unit – 1.4m AOD Point Source PCSK Inverter – 1.1m AOD Point Source Substation Transformers – 2.5m AOD Point Source

*All receptors modelled 1.0m from building façade unless otherwise stated.

It is acknowledged that a number of the values of parameters chosen will affect the overall noise levels presented in this report. However, it should be noted that the values used, as identified above, are worst-case.

4.2 Model Input Data

The primary sources of noise from the operational phase of the proposed development are listed below:

- 200 No. Energy Storage Units
- 50 No. Power Conversion System Inverters (PCSK)
- 2 No. Substation Transformers

The primary noise sources included in the noise model are presented in **Table 4.1**. ESS units, PCSK units and substation transformers are modelled as point sources. The frequency spectra data used in the modelling is presented in Appendix B Manufacturers noise data has been used where possible.

It should be noted that the development is not expected to operate continuously, with similar developments tending to be called upon for short periods by National Grid, typically during the peak daytime periods and rarely during the night-time hours. However, to present a worst-case assessment, the proposed development is considered to be fully operational during the daytime and night-time periods.

4.3 Sensitive Receptors

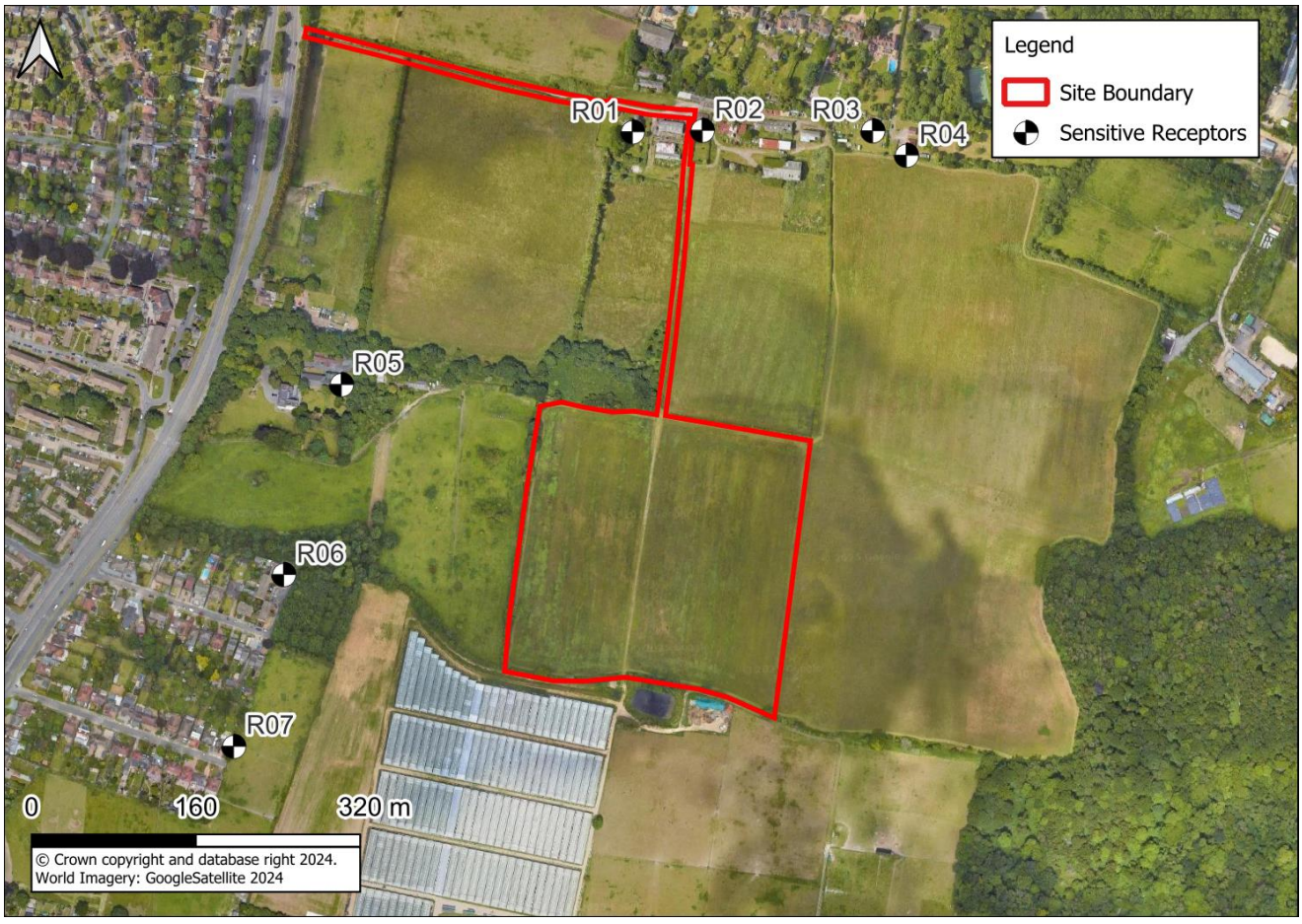
4.3.1 Existing Sensitive Receptor Locations

Table 4.2 below summarises receptor locations that have been selected to represent worst-case sensitive receptors with respect to direct noise from the site. Façades of the nearest noise sensitive properties to the development site have been represented. The locations of the receptors are presented within **Figure 4.1**.

Table 4.2: Existing Sensitive Receptor Locations

Ref.	Description	Type of Use	Approximate Distance from Site Boundary (m)
R01	Manor Farm, North Cray Road	Residential	270
R02	1-2 Manor Farm Cottages, North Cray Road	Residential	280
R03	41 Parsonage Lane	Residential	300
R04	43 Parsonage Lane	Residential	290
R05	141 North Cray Road	Residential	230
R06	10-12 Cornell Close	Residential	230
R07	21 Barton Road	Residential	270

Figure 4.1: Existing Sensitive Receptor Locations



4.4 Representative Background Noise Levels

Using the data collected during the baseline survey, representative background noise levels have been derived for all receptor locations presented in **Figure 4.1**. **Table 4.3** presents the representative background noise levels considered appropriate for the existing sensitive receptors within the area (the lower of the respective daytime and evening measurements have been used to represent daytime noise levels, where appropriate).

Table 4.3: Representative Background Noise Levels (All Receptors)

Receptors	Monitoring Location	Time Period	Representative Background Noise Level ($L_{A90,T}$ dB)*
R01, R02, R03 and R04	LT1	Daytime (07:00 – 23:00)	46
		Night-time (23:00 – 07:00)	38
R05, R06 and R07	LT2	Daytime (07:00 – 23:00)	46
		Night-time (23:00 – 07:00)	36

*Lowest $L_{A90,T}$ value selected from either Weekday or Weekend.

The representative noise levels presented in **Table 4.4** have been used to inform the assessment presented in Section 5.0.

5.0 Assessment of Effects

5.1 Operational Phase

5.1.1 BS 4142:2014 Noise Assessment

BS 4142:2014 states that corrections should be applied to account for certain acoustic features which have the potential to increase the level of effect at nearby properties.

The character of the sound from the development will generally be low level and constant, with no rapid change in the level or character of noise. Therefore, no impulsive penalty is considered necessary.

It is considered that the plant items will not have identifiable on/off conditions, with many items operating at gradually varying loads. Therefore, no intermittency penalty should be applied.

To determine whether a tonal penalty should be applied, the one-third octave objective method as described in Annex C of BS 4142:2014 has been utilised. The results of the analysis show that the predicted noise at the nearest sensitive receptors is unlikely to contain any tonal characteristics. Moreover, the nearest existing sensitive receptors are in excess of 200m from the proposed site and as such, any potential acoustic features are not considered to be perceptible at these distances. Therefore, no penalty for tonality has been applied.

The assessment below compares the predicted cumulative noise levels from the proposed development with the existing background noise L_{A90} at the surrounding noise sensitive receptors. **Table 5.1** presents the difference between the background noise level and noise rating level associated with the proposed development.

Table 5.1: BS4142 Assessment

Location	Existing Measured Background L_{A90}		Noise rating level from plant		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R01	46	38	36	36	-10	-2
R02	46	38	36	36	-10	-2
R03	46	38	34	34	-12	-4
R04	46	38	34	34	-12	-4
R05	46	36	39	39	-7	+3
R06	46	36	38	38	-8	+2
R07	46	36	35	35	-11	-1

All values are sound pressure levels in dBA re: 2x 10^{-5} Pa.
All calculations used to derive the above table (including averaging of background noise levels and predicted source noise levels) have been undertaken to 1 decimal place to avoid perpetuation of rounding errors. However, in accordance with BS4142 para 8.6 the levels are expressed as integers (with 0.5 dB being rounded up). This may mean that the arithmetic in the above table may appear to be up to 1 dB incorrect due to this rounding.

As demonstrated within **Table 5.1**, the results of the assessment indicate that the BS4142 noise rating levels at sensitive façades of all the existing noise sensitive properties are below the existing daytime background noise levels, with two exceedances of +3 dB and +2 dB above the existing night-time background noise levels predicted at receptors R05 and R06 respectively.

As such, based on the criteria outlined in **Table 2.1** of this report, noise rating levels from plant associated with the operation of the proposed site are predicted to be within the No Observed Adverse Effect Level (NOAEL) at all receptors for the daytime period, and at receptors R01 to R04 and R07 during the night-time period.

At receptors R05 and R06, noise rating levels from plant associated with the operation of the proposed site are predicted to be within the Lowest Observed Adverse Effect Level (LOAEL) threshold during the night-time period. In accordance with BS 4142:2014+A1:2019, this is an indication of a low impact.

For the purposes of a robust assessment, a combined noise intrusion assessment utilising BS 8233:2014 has been undertaken below.

5.1.2 Noise Intrusion Assessment

Internal noise levels at sensitive receptor locations, from all potential noise sources associated with the proposed development have been assessed both with windows open, where a reduction from a partially open window of 10 dB has been used, and with windows closed where an assumption of double glazing with a sound reduction of 30 dB R_{w+Ctr} has been used.

Results of the noise intrusion assessment for average daytime and night-time noise levels are presented within **Table 5.2** and **Table 5.3** respectively, with night-time noise levels presented illustratively within **Figure 5.1**.

Table 5.2: Daytime Noise Intrusion Levels $L_{Aeq,1hour}$

Location	External L_{Aeq}	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria L_{Aeq}
R01	35.8	25.8	5.8	35
R02	35.6	25.6	5.6	35
R03	34.4	24.4	4.4	35
R04	34.3	24.3	4.3	35
R05	39.4	29.4	9.4	35
R06	38.4	28.4	8.4	35
R07	34.6	24.6	4.6	35

All values are sound pressure levels in dBA re: 2x 10^{-5} Pa.

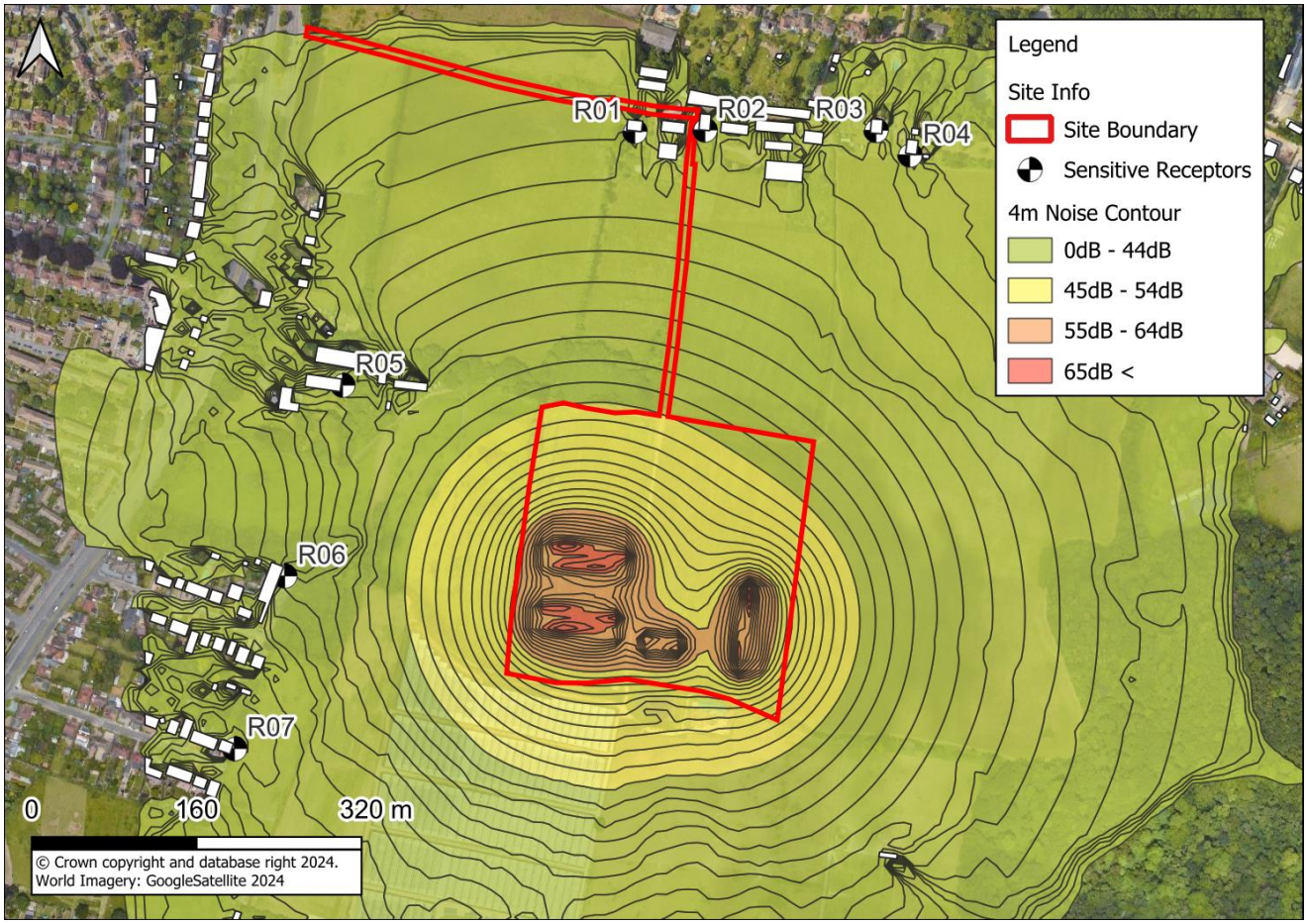
Table 5.3: Night-time Noise Intrusion Levels $L_{Aeq,15min}$

Location	External L_{Aeq}	Internal L_{Aeq} with windows open	Internal L_{Aeq} with windows closed	Criteria L_{Aeq}
R01	35.8	25.8	5.8	30
R02	35.6	25.6	5.6	30
R03	34.4	24.4	4.4	30
R04	34.3	24.3	4.3	30
R05	39.4	29.4	9.4	30
R06	38.4	28.4	8.4	30
R07	34.6	24.6	4.6	30

All values are sound pressure levels in dBA re: 2x 10^{-5} Pa.

As demonstrated within **Table 5.2** and **Table 5.3** above, predicted noise levels are below the BS8233/WHO internal daytime and night-time noise level criteria with windows open at all receptors, which results in a No Observed Adverse Effect Level (NOAEL).

Figure 5.1: Night-time $L_{Aeq,15min}$ Noise Contour Plot (Grid Height 4m)



5.1.3 Change in Noise Level Assessment

This assessment has been undertaken to compare worst-case representative noise levels from the 'existing ambient noise levels' (L_{Aeq}) to predicted ambient noise levels inclusive of the proposed scheme at existing sensitive receptors. The differences between the 'existing' and the 'proposed' development scenarios, during the daytime and night-time are presented in **Table 5.4** and **Table 5.5** below.

Table 5.4: Difference Between Baseline and Proposed Scenarios (Daytime)

Location	Measured Baseline $L_{Aeq,16hr}$	Measured Baseline Combined with Contribution from Proposed Scenario	Contribution from Proposed Development $L_{Aeq,16hr}$
R01	50.2	50.4	0.2
R02	50.2	50.3	0.1
R03	50.2	50.3	0.1
R04	50.2	50.3	0.1
R05	49.6	50.0	0.4
R06	49.6	49.9	0.3
R07	49.6	49.7	0.1

All values are sound pressure levels in dBA re: $2x\ 10^{-5}$ Pa.

Table 5.5: Difference Between Baseline and Proposed Scenarios (Night-time)

Location	Measured Baseline $L_{Aeq,16hr}$	Measured Baseline Combined with Contribution from Proposed Scenario	Contribution from Proposed Development $L_{Aeq,16hr}$
R01	46.4	46.8	0.4
R02	46.4	46.7	0.3
R03	46.4	46.7	0.3
R04	46.4	46.7	0.3
R05	46.8	47.5	0.7
R06	46.8	47.4	0.6
R07	46.8	47.1	0.3

All values are sound pressure levels in dBA re: $2x\ 10^{-5}$ Pa.

As demonstrated in **Table 5.4** and **Table 5.5**, the noise contribution from the proposed development would result in an increase of ambient noise levels of up to +0.4 dB during the daytime period and up to +0.7 during the night-time period. This is indicative of a negligible short-term impact as defined by the IEMA 2014 Guidelines for Environmental Noise Impact Assessment. As such, noise levels from the proposed operation of the development at the surrounding existing sensitive receptors are predicted to result in the No Observed Adverse Effect Level (NOAEL) for the daytime and night-time period.

6.0 Conclusion

A noise impact assessment has been undertaken in support of a planning application for the development of an Energy Storage System (ESS) facility on land at North Cray Road, Sidcup, DA14 5HE.

A baseline noise survey was undertaken between Thursday 30th January and Wednesday 5th February 2025 to establish the existing background noise levels (L_{A90}) and ambient noise levels ($L_{Aeq,T}$) at the surrounding existing sensitive receptors during the daytime and night-time periods.

The BS4142 noise rating levels at the nearest sensitive receptors associated with the operation of the development are below the existing daytime background noise levels and up to +3 dB above the existing night-time background noise levels. This results in a Lowest Observed Adverse Effect Level (LOAEL) during the night-time period only, which is an indication of a low impact in accordance with BS 4142.

The combined operational noise levels from all proposed noise sources associated with the site were also assessed against the WHO/BS 8233 criteria. During the daytime and night-time period, noise levels at all receptors are predicted to be below the criteria with windows open, resulting in a No Observed Adverse Effect Level (NOAEL).

Further context was provided by comparing the existing ambient noise levels (L_{Aeq}) to the predicted ambient noise levels inclusive of the noise emissions from the operation of the proposed development. The change in the ambient noise levels show that the short-term impact would be negligible for the daytime and night-time period in accordance with the IEMA 2014 guidelines. Therefore, predicted noise levels fall into the No Observed Adverse Effect Level (NOAEL) or lower.

The NPPF provides test points against which the proposed development has been assessed. Considering these points, the following conclusions can be drawn:

<u>NPPF paragraphs 198 and 201</u>

Based upon the assessments presented, it is considered that the development does not adversely affect or put sensitive receptors at risk from noise pollution, and no significant adverse effects are predicted to occur.

Planning Practice Guidance: Noise

It has been predicted that on-site operational noise effects associated with the Development will be below the Lowest Observed Adverse Effect Level (LOAEL) threshold and therefore the development will have a low impact in relation to noise.

Appendices

Appendix A – Acoustic Terminology

Acoustic Terminology

dB Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.

dB(A) Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.

L_{Aeq} Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The $L_{Aeq,\ 07:00\ –\ 23:00}$ for example, describes the equivalent continuous noise level over the 16-hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower that the $L_{Aeq,\ 07:00\ –\ 23:00}$.

L_{Amin} The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.

L_{Amax} The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.

L_n Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say. 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the $L_{A10,\ 1\ hr}$ = x dB.

The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.

R_w The *weighted sound reduction index* determined using the above *measurement* procedure but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

Appendix B – Noise Modelling Data

Table B.1: Plant Noise Data

Plant	Third Octave Band (Hz) Sound Power Level (L_w) dB re: $1x10^{-12}$ W																									L_w(A)
	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	
PCSK Inverter (INGECON Sun 3Power C Series)	-	-	-	51.3	50.2	52.2	67.5	67.3	61.6	68.1	73.7	71.6	77.0	74.7	74.6	74.9	75.6	75.9	73.4	72.4	73.9	80.6	67.2	64.3	71.1	61.3	59.6	86.7
Substation Transformer	-	-	-	-	81.0	-	-	81.0	-	-	81.0	-	-	81.0	-	-	81.0	-	-	81.0	-	-	81.0	-	-	81.0	-	90.0
Energy Storage Unit (FinDreams Battery)	-	-	-	35.7	35.4	49.7	46.1	50.7	62.3	54.9	57.4	55.0	58.8	59.7	59.6	61.6	61.6	60.9	58.3	58.3	57.0	56.7	57.4	53.6	52.9	48.5	44.8	71.2

Appendix C – References

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