

NOISE ASSESSMENT

on behalf of

SHAW ENERGI

for the site at

**CLAY LANE/FURBARN ROAD, ROCHDALE,
OL11 5UT**

REPORT DATE: 14 JULY 2023

REPORT NUMBER: 102997 VERSION 2

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Summary

Cumulative operational plant noise rating limits have been set for operations associated with the proposed 57 MW BESS off Lower Jowkin Lane, Rochdale.

The cumulative operational plant noise rating limit is based on the modal night time $L_{A90,5\text{minute}}$ background sound level measured during an unattended survey which was undertaken between approximately 14:15 hours on 11th May 2023 and 07:50 hours on 15th May 2023. In line with BS 4142:2014+A1:2019, noise rating limits have been set at 5 dB above the representative background sound level in order to achieve a low noise impact within the context of the site.

A cumulative plant noise rating limit of 33 dB has been set at the first floor windows of the nearest noise sensitive receptors.

It is recommended that should this application gain planning consent, a suitably worded planning condition be provided which ensures that cumulative operational noise resulting from the proposed development does not exceed a rating level of 33 dB at the nearest and worst affected noise-sensitive receptors.

Record of changes

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Signed:		Signed:	
Date:	14 July 2023	Date:	14 July 2023

Version	Date	Change	Initials
1	12 July 2023	-	WW
2	14 July 2023	Minor amendments to the description of the site and development advised by the client	WW

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1 Introduction

- 1.1 Miller Goodall Ltd has, on behalf of Shaw Energi, set plant noise limits in respect of the impact due to noise from the proposed Battery Energy Storage System (BESS) on nearby sensitive noise receptors.

2 Site Description

- 2.1 The site is located along Furbarn Road, containing the BESS to the east of the Woof n Ready, Rochdale and Ashworth Cattery animal businesses.
- 2.2 The area is currently a farm field confined between Furbarn Road, Rake and Lower Jowkin Lane.
- 2.3 The site is located south of the village of Norden, surrounded mostly by fields albeit with the pet businesses to the west. The closest noise sensitive receptor is a residential dwelling approximately 55 m southwest of the proposed BESS, off Lower Jowkin Lane. Consideration must also be given to the proposed allocation of land on the opposite side of Furbarn Road for residential development (draft Places for Everyone Plan - Allocation JPA19). Whilst this land is not yet the subject of an application for planning permission a masterplan for the site has been prepared as part of the PFE process which indicates that residential development could be located within 70 metres of the nearest BESS structure.
- 2.4 Appendix 1 presents the site layout plan.

3 Proposed Development

- 3.1 The proposed 57 Mega-Watt (MW) BESS consists of battery modules with a thermal and battery management system, as well as a site controller, DC cabling and communication harnesses, an AC circuit breaker, system meters as well as transformers, switchgear and similar.
- 3.2 The proposed working hours for the operational BESS are Monday to Sunday including bank holidays – 24 hrs a day.

4 Policy Context

4.1 National Planning Policy Framework

- 4.1.1 The National Planning Policy Framework (NPPF¹) initially published in March 2012, was updated in July 2021. One of the documents that the NPPF replaces is Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise"².

¹ National Planning Policy Framework, Ministry of Housing, Communities and Local Government, July 2021

² Planning Policy Guidance 24: Planning and Noise, DCLG, September 1994

- 4.1.2 The revised NPPF advises that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives). One of these is an environmental objective which is described in par. 8 (c):

“to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”

- 4.1.3 For the construction and enabling works for BESS and BESS operation itself the policy in paragraph 174 we are advised that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.”

- 4.1.4 Par. 185 goes on to state:

“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 impacts 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.”

4.2 Noise Policy Statement for England

- 4.2.1 The Noise Policy Statement for England (NPSE³), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse effects on health and quality of life;
- mitigate and minimise adverse effects on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.”

³Noise Policy Statement for England, Defra, March 2010

- 4.2.2 The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and the quality of life occur.
- 4.2.3 The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the Statement). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:
- “...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development”.
- 4.2.4 Importantly, the NPSE goes on to state:
- “This does not mean that such adverse effects cannot occur”.
- 4.2.5 The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:
- “Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available”
- 4.2.6 It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

4.3 **BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’**

- 4.3.1 BS 4142:2014+A1:2019⁴ provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. It replaced the 1997 edition of the Standard in October 2014 and was amended in June 2019. The amended version corrected a number of printing errors and further clarified that the standard is used to assess external noise levels, and not internal noise levels (although this can form part of the discussion regarding context). The key aspects of the Standard are summarised below.
- 4.3.2 The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).
- 4.3.3 The Specific Noise Level - the noise level produced by the source in question at the assessment location - is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

⁴ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

4.3.4 In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

- Typically, the greater this difference, the greater the magnitude of the 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.

4.3.5 In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014+A1:2019 edition places emphasis upon an appreciation of the context, as follows:

“An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.”

4.4 Adopted Target Criteria

4.4.1 Based on the advice above, the target criteria in Table 1 has been adopted. These target levels are considered to be levels where no adverse or significant adverse impacts will occur due to noise.

Table 1: Adopted target criteria at dwellings

Phase	Assessment Standard	Target for Lowest Observed Adverse Effect Level or less	
		Relative Target	Absolute Target
Operational	BS4142:2014+A1:2019	Rating Level ($L_{A,T}$) ≤ 5 dB above existing daytime, evening and night-time typical $L_{A90,T}$ sound level	-

5 Local Authority Consultation

5.1.1 Environmental Health of RBC was consulted in respect of the methodology used in this assessment. It was agreed that Miller Goodall would undertake a noise assessment at the site of the proposed development, utilising unattended measurements of background and ambient sound levels to inform the assessment. Since the consultation response, Miller Goodall has been instructed by the client to set plant noise limits which will advise the plant selection and potential mitigation.

6 Noise Survey

6.1 Measurements of Existing Noise Sources

- 6.1.1 Unattended noise measurements were undertaken at Monitoring Position 1 (MP1) in the northeast corner of the development site. Appendix 2 presents the survey location.
- 6.1.2 The measurements were made following BS 7445-1: 2003⁵ by Steve Maslivec of Miller Goodall Ltd.
- 6.1.3 At the start and finish of the survey, the noise climate was noted at both locations. At MP1 the noise climate was considered to be quiet with occasional noise from road traffic pass-by events along nearby roads.
- 6.1.4 The calibration of the sound level meter was checked before and after measurements with negligible deviation (≤ 0.1 dB). Details of the equipment used are shown in Table 2, below.

Table 2: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1 ^{6,7} Integrating Real Time 1/3 Octave Sound Analyser	NOR 140	Norsonic	1407510	15/12/2021	05552/1
Microphone	NOR 1225	Norsonic	384687	15/12/2021	05552/1
Class 1 Calibrator ⁸	NOR 1251	Norsonic	34123	13/10/2022	05972/1
Outdoor microphone housing	NOR 1217	Norsonic	12175738	N/A	N/A

6.2 Monitoring Results

- 6.2.1 Chart 1 presents the survey data from 07:00 – 23:00 and 23:00 – 07:00 from 11th May to 15th May 2023.
- 6.2.2 Each measurement period consisted of sequential 5-minute samples which therefore allowed the variation in noise level over time to be assessed.
- 6.2.3 For the operational BESS, background sound levels have been calculated using the methodology in BS 4142:2014+A1:2019 to derive a typical background sound level reported as an $L_{A90,5min}$ dB.

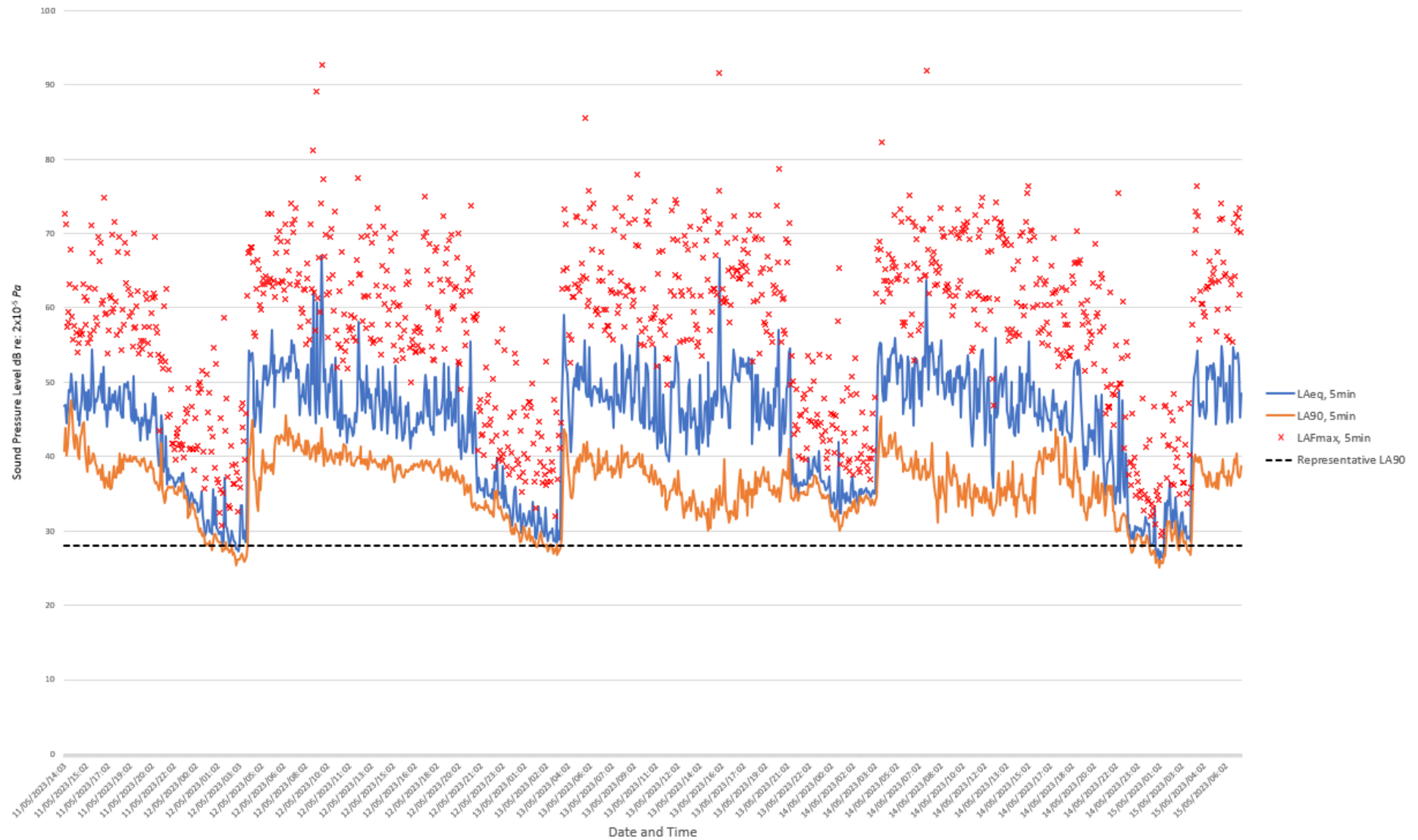
⁵ BS 7445-1: 2003 Description and measurement of environmental noise - Part 1: Guide to quantities and procedures

⁶ IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

⁷ IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

⁸ IEC 60942 (2003) Electroacoustics – Sound calibrators

Chart 1: Summary of Broadband Measurement Data



- 6.2.4 As the plant will be operational 24 hours a day, it is necessary to base the noise rating limit on the periods where background noise levels are lowest, which occurs during the night-time periods. The modal background sound level calculated during the night-time periods of the survey is 28 dB.

7 Cumulative Plant Noise Rating limits

- 7.1.1 The table below presents the cumulative plant noise rating limit at the nearest noise sensitive receptors as identified in section 2 of this report.

Table 3: BS4142:2014+A1:2019 Cumulative Plant Noise Rating Limit based on Measured Data

Assessment Step	Sound Level dB		Description
	At Nearest Noise-Sensitive Receptor		
Representative Background Sound Level $L_{A90,15min}$ dB	28		Modal night-time background sound level
Adopted Criteria	+5		Rating Level ($L_{Ar,T}$) ≤ 5 dB above existing daytime, evening and night-time typical $L_{A90,T}$ sound level
Cumulative Rating Level Limit, $L_{Ar,T}$ dB	33		This is the limit for the rating level at the nearest noise sensitive receptors with all proposed plant operating simultaneously
Noise Impact			Low noise impact within context

7.2 Context

- 7.2.1 A rating level of $L_{A,r,T}$ 33 dB is + 5 dB relative to the representative background sound level which is at the threshold of an adverse impact. However, it is worth noting that BS 4142:1997 considered a background sound level of 30 dB and rating levels below 35 dB to be “very low”.
- 7.2.2 Achieving a rating level of 33 dB externally at the nearest noise sensitive receptors will result in internal sound levels significantly below the generally accepted ambient sound level design criteria of 30 dB(A) stated in BS 8233:2014. Assuming an attenuation through a window opened for ventilation of 10 dB (WHO suggests an allowance of 10 – 15 dB), the predicted indoor noise level would be in the region of 23 dB at worst, 7 dB less than the BS 8233:2014 internal ambient sound level criteria in bedrooms at night-time. At these levels, we would anticipate the noise from any mechanical services plant to be barely audible.

8 Conclusions

- 8.1 Cumulative operational plant noise rating limits have been set for operations associated with the proposed 57 MW BESS off Lower Jowkin Lane, Rochdale.
- 8.2 The cumulative operational plant noise rating limit is based on the modal night time $L_{A90,5\text{minute}}$ background sound level measured during an unattended survey which was undertaken between approximately 14:15 hours on 11th May 2023 and 07:50 hours on 15th May 2023. In line with BS 4142:2014+A1:2019, noise rating limits have been set at 5 dB above the representative background sound level in order to achieve a low noise impact within the context of the site.
- 8.3 A cumulative plant noise rating limit of 33 dB has been set at the first floor windows of the nearest noise sensitive receptors.
- 8.4 It is recommended that should this application gain planning consent, a suitably worded planning condition be provided which ensures that cumulative operational noise resulting from the proposed development does not exceed a rating level of 33 dB at the nearest and worst affected noise sensitive receptors.

APPENDICES

Appendix 1: Site Layout Plan



Appendix 2: Monitoring Locations



Glossary of Terms

- Decibel (dB)** The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa , the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under controlled conditions.
- dB L_A** Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A ; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A .
- $L_{A90,T}$** The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014+A1:2019 it is used to define background noise level.
- $L_{Aeq,T}$** The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.
- L_{Amax}** The highest A weighted noise level recorded during the time period. It is usually used to describe the highest noise level that occurred during the event.
- $L_{A,T}$** The specific sound level under investigation plus any adjustment for the characteristic features of the sound such as tonality, impulsivity, intermittency or other feature that would distinguish it from the background sound level
- NOEL** No observed effect level: the level of noise exposure below which no effect at all on health or quality of life can be detected.
- NOAEL** No observed adverse effect level: the level of noise exposure above which effects on health or quality of life can be detected but are not considered to be adverse.
- LOAEL** Lowest observed adverse effect level: the level of noise exposure above which adverse effects on health or quality of life can be detected.
- SOAEL** Significant observed adverse effect level: the level of noise exposure above which significant adverse effects on health or quality of life can be detected.

