Memo

From: **Richard Pennell, Environmental Noise Solutions Limited.**

To: **Jake Stentiford, Surface Planning.**

Subject: **Proposed Battery Facility, Hopewell Street, Barnsley, S70 3ET.**

Date: **18 September 2017.**

Ref: **6729/18/9/17/RP.**

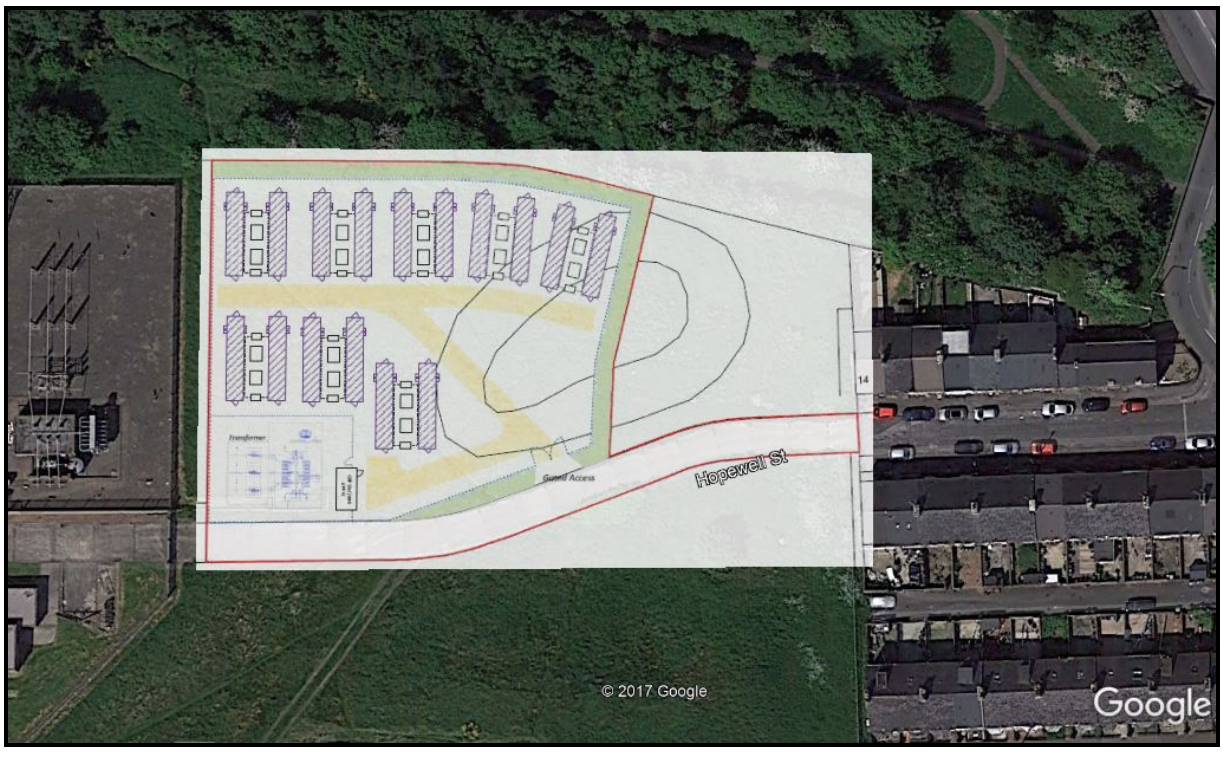
1.00 INTRODUCTION

1.01 This memo has been prepared to consider the potential noise impact of a proposed energy storage power conversion system (PSC) compound off Hopewell Street, Barnsley. The proposed compound is located to the east of an existing sub-station, off Hopewell Street, Barnsley, S70 3ET. An aerial image of the site, including an overlay of the proposed compound, is contained in Figure 1 below.

1.02 The proposed development consists of 16 battery storage containers. The containers consist of a battery compartment and inverter compartment, with external doors to the inverter compartment (and an internal door from the inverter compartment to the battery compartment). Each container includes four external condensing units (two mounted on each 'long' side of the container) and air extract louvres located over the inverter external doors. The air extract louvres are the primary noise source associated with the plant system.

1.03 The nearest noise sensitive receptors (NSRs) were identified as dwellings off Ashleigh Vale, circa 150 metres to the south of the closest containers (NSR1) and dwellings off Hopewell Street, circa 38 metres to the east of the closest container (NSR2). It is understood that there is an earth bund on the eastern boundary of the compound, with screening provided such that there is no line of sight from the containers to the Hopewell Street dwellings.

Figure 1: Proposed Compound



2.00 BASELINE NOISE MEASUREMENTS

2.01 Background noise measurements of the existing noise climate were undertaken on Wednesday 18th May 2016, using a calibrated Bruel & Kjaer 2250 Type 1 sound level meter.

2.02 Background noise levels ($L_{A90,T}$) during the night time were measured at 37 dB $L_{A90,T}$ at both receptors (around midnight) and consisted predominantly of distant road traffic.

3.00 NOISE EMISSIONS ASSOCIATED WITH THE BATTERY CONTAINERS

3.01 The noise emissions associated with the operation of the battery containers have been assessed with reference to two monitoring reports of existing installations undertaken by third parties and provided by Surface Planning.

3.02 The measurements were undertaken spatially around a container at 1 metre from the external wall in a free field environment, with the container equipment operating at full duty. The highest noise emission level was measured at 64 dB $L_{Aeq,T}$ at 1 metre from the extract louvres (on the 'long' side of the container) – considered representative of NSR2. Based on 1/3 octave analysis, the noise emissions were broadband in nature. The noise emission level at the 'short' end of the container, at the end away from the inverter compartment (considered representative of NSR1), did not exceed the residual background noise level of 54 dB(A). On this basis, the noise emission level is at least 10 dB lower than the residual background noise level (i.e. ≤ 44 dB $L_{Aeq,T}$).

4.00 NOISE IMPACT ASSESSMENT – ASHLEIGH VALE (NSR1)

4.01 Ashleigh Vale (NSR1) is further from the battery containers than Hopewell Street (NSR2). The ends of the 16 containers are oriented towards the receptors.

4.02 **Based on standard acoustic theory and the relative locations/orientation of the battery containers and NSR1, the noise emission level of the compound has been calculated at 12 dB $L_{Aeq,T}$ at NSR1**.

4.03 The calculations are based on 16 units with a noise emission level of 44 dB $L_{Aeq,T}$ at 1 metre from the end of the container (total 56 dB $L_{Aeq,T}$) and distance attenuation of 44 dB (20* $\log_{10}$ (1/150)).

5.00 NOISE IMPACT ASSESSMENT – HOPEWELL STREET (NSR2)

5.01 Hopewell Street (NSR2) is to the east of the battery compound. The containers are oriented in three rows, such that the 'long' side of the end container on each row provides screening from the containers to the west.

5.02 **Based on standard acoustic theory and the relative locations/orientation of the battery containers and NSR2, the noise emission level of the compound has been calculated at 24 dB $L_{Aeq,T}$ at NSR2.**

5.03 The calculations are based on three 'end row units' with a noise emission level of 64 dB $L_{Aeq,T}$ at 1 metre from the extract air louvres. The cumulative noise level at NSR2 was then calculated allowing for distance attenuation from each container (38 metres for the northern row, 71m metres for the middle row and 60 metres for the southern row). 10 dB screening for the eastern boundary bund was allowed, based on the guidance in BS 5228:2009 Part 1 which states *'In the absence of spectral data, as a working approximation, if there is a barrier or other topographic feature between the source and the receiving position, assume an approximate attenuation of 5 dB when the top of the plant is just visible to the receiver over the noise barrier, and of 10 dB when the noise screen completely hides the sources from the receiver. High topographical features and specifically designed and positioned noise barriers could provide greater attenuation*.'

6.00 CONCLUSIONS

6.01 On the basis of the assessment detailed above, the noise emission level of the compound is significantly lower than the measured night time background noise level at NSR1 and NSR2. As such, no impact on residential amenity with respect to noise is anticipated.

Regards,



Richard Pennell
For Environmental Noise Solutions Limited