

# Acoustic Report

## Noise Impact Assessment for the Proposed New ALDI Retail Store at East Road, Egremont, CA22 2DJ

Our Reference – J3225

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Survey and Report by – Paul Horsley MIOA

## DOCUMENT ISSUE RECORD

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## Limitations

The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at that time.

All of the comments and opinions contained in this report, including any conclusions, are based on the information obtained by Paul Horsley Acoustics Ltd during our investigations.

There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been considered by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

Any diagram or opinion of the possible configuration of the findings is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

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- a) the date on which this assessment was undertaken; and
- b) the date on which the final report is delivered.

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### **1.0 Agent**

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### **2.0 Subject**

Proposed New ALDI Retail Store  
Land at the former East Road Garage  
Wyndham Place  
Egremont  
CA22 2EB

### **3.0 Aims**

The aim of this report is to provide a noise impact assessment of the primary noise sources likely to be attributable to the proposed new build at the ALDI retail store.

The impact assessment will account for the noise sources produced by the store with respect to the closest existing and proposed future noise sensitive residential dwellings prior to works commencing and to inform the Planning Application accordingly.

Where necessary, provision of mitigation recommendations to achieve the design intent will be provided.

#### 4.0 Proposed ALDI Store Location

For the purposes of this assessment the following assumptions are applicable to the proposed new ALDI store Wyndham Place, Egremont for which this report is to be utilised.

- The new ALDI retail store will be located within its own bounded site.
- The proposed facility will have dedicated vehicle access from Wyndham Place via East Road to the north of the site.
- The car park will be located at the north of the store building.
- There will be a loading bay to the southern side of the store which incorporates a slope down to allow ground level loading directly into the store via a ramp.
- Any externally located fixed plant items will be positioned together inside a caged compound to the southern corner of the site.
- Servicing of the store will be required 24-hours daily.

Refer to Appendix B for details of the proposed site layout.

#### 5.0 Site Location and Description of Noise Sources

The proposed new ALDI Egremont Store will be located on the land formerly occupied by East Road Garage to the southern side of East Road. The site is located to the eastern side of Egremont town centre adjacent to the A595 Egremont Bypass.

The proposed store will comprise of a single storey shopping unit and service dock to the south, with a customer carpark area to the north of the store building. Access to the site will be gained from Wyndham Place via East Road to the north through a widened existing to the site. The proposed fixed plant installation will be located to the southern corner of the store building within an open mesh enclosure.

The site is bounded to the east by Wyndham Place having residential premises located beyond consisting of terraced and detached 2-storey residential premises, positioned in a lower elevation than the site. The southern site boundary is formed by detached 2-storey residential premises, also positioned at a lower elevation than the site. The A595, Egremont Bypass, forms the western site boundary, with the town centre located on the opposite side of the road. The northern site boundary is formed by the junction of East Road with a roundabout accessing the A595 bypass and Main Street to the west. There is a parade of terraced premises located at the corner of East Road and Wyndham Place leading north away from the site along East Road.

The closest noise sensitive premises to the site are the residential premises positioned along the northern boundary of the site at East Road. These premises are the closest properties to the car park area and store entrance. There are further properties located to the south of the site, with Rivendale, a detached house located along the site boundary.

The primary noise sources within the vicinity of the site are due to traffic movements along the A595, Egremont Bypass and residual traffic noise from the local road network. Seagulls overhead are also significant noise sources in the area at all times of day and night. Military and civilian aircraft are audible throughout.

The store is proposed to be open from 08.00 hours to 22.00 hours Monday to Saturday and Sunday 09.00 to 19.00, with all plant and equipment operating to suit and the refrigeration equipment operating 24-hours on a demand basis.

## 6.0 Guidance on the Assessment of Noise Levels

The purpose of any criterion or standard for environmental noise should be to safeguard against unacceptable levels of community response, deemed as a feeling of annoyance during daytime or disturbance at night. WHO defines annoyance as "...a feeling of displeasure evoked by noise."

The main source of information relating to noise and the community response are field studies including noise measurements and social surveys. These studies then attempt to establish a correlation between the two sets of results.

In the absence of any definitive guidance and to establish suitable noise criteria, it is necessary to rely on general guidance and assessment methods used for community noise sources. Discussions on the current methods are given below.

### 6.1 BS4142:2014+A1:2019 'Method for Rating and Assessing Industrial and Commercial Sound'.

The standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

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

The methods described in this British Standard use outdoor sound levels to assess the effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. The standard compares sound from industrial / commercial sources with the background sound level.

In addition to the above, the standard states "Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level." Such features are considered by adding a correction to the specific sound level depending on the extent to which the distinguishing acoustic characteristics will attract attention. The standard states the following:

**Tonality:** For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of +2 dB for a tone that is just perceptible at the noise receptor, +4 dB where it is clearly perceptible, and +6 dB where it is highly perceptible. Where the subjective method is considered not sufficient for the determination of tonality, alternative methods including a one third octave band analysis method, which assesses the  $L_{zeq}$  sound pressure level in a one third octave band against adjacent one third octave bands. If a tone is identified, then a tonal correction of +6 dB should be applied.

A tone can be considered present where the difference between both adjacent one-third octave bands is as follows.

- 15dB difference between 25Hz – 125Hz
- 8dB difference between 160Hz – 400Hz
- 5dB difference between 500Hz – 10,000Hz

**Impulsivity:** A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of +3 dB for impulsivity, which is just perceptible at the noise receptor, +6 dB where it is clearly perceptible, and +9 dB where it is highly perceptible.

**Other sound characteristics:** Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.

Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be considered. If one feature is dominant, then it may be appropriate to apply a single correction. Where both features are likely to affect perception of response, the correction ought normally to be applied in a linear fashion.

**Intermittency:** When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time-period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over several shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.



BS4142 provides guidance on the assessment of noise impacts as below:

The significance of sound of an industrial / commercial nature depends upon both the margin by which the rating of the specific sound source exceeds the background sound level and the context in which the sound occurs. 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.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level, and consider the following:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) 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 minimal impact, depending on the context.

The Standard introduces additional rating elements, these being subject assessments of tonality, and impulsivity of a sound source, with weighted rating values accordingly applied at the judgment of the assessor. The introduction of Uncertainty has been applied to the measured values; again, consideration of this is left to the professional executing the survey and assessment. However, steps are provided within the Standard for the reduction of uncertainty in both measurement and calculations of the sound source and rating value. Actual meteorological conditions are now required to be recorded and reported upon for the survey and report.

## **6.2 World Health Organization 1999 "Guidance for Community Noise"**

This document provides a review of the effects of noise and a description of the principles of the WHO health criteria and guidelines for Community Noise.

The effects of noise in dwellings are identified as sleep disturbance, annoyance, and speech interference. For bedrooms, the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB

L<sub>Aeq</sub> for continuous noise and 45 dB L<sub>Max</sub> for sound events. At nighttime, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB L<sub>Aeq</sub>, so that people may sleep with bedroom windows open. This value is equivalent to that specifies in the Criteria 12 document; however, it is now assumed that the noise reduction from outside to inside with the window open is 15 dB.

To enable casual conversation indoors during the daytime, the sound level of the interfering noise should not exceed 35 dB L<sub>Aeq</sub>.

To protect the majority of people from being **seriously** annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB L<sub>Aeq</sub> on balconies, terraces and in outdoor living areas. To protect the majority of people from being **moderately** annoyed during the daytime, the outdoor sound level should not exceed 50 dB L<sub>Aeq</sub>.

Table 1 of the document summarises the guideline values for community noise in specific environments and includes the noise indices to be adopted. Significantly, the corresponding time base to be used for the assessment is also included.

The relevant extracts of Table 1 are reproduced thus:

Specific Environment	Critical health effect (s)	L <sub>Aeq</sub> dB	Time Base hours	L <sub>Max</sub> dB
Outdoor living area	Serious annoyance, daytime, and evening	55	16	-
	Moderate Annoyance, Daytime, and evening	50	16	-
Dwelling, Indoors	Speech intelligibility & moderate annoyance daytime & evening.	35	16	-
	Sleep Disturbance, night-time	30	8	45
Outside Bedroom	Sleep disturbance, window open (Outdoor Values)	45	8	60

### 6.3 Subjective Impression of Noise Level Differences

The following Table provides a semantic scale that may be used to “subjectively” rate changes in sound pressure level.

#### Subjective effect of changes in sound pressure level

Change in sound level dB	Change in Power		Change in apparent loudness
	Decrease	Increase	
3	1/2	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half / Twice as loud
20	1/100	100	Much quieter / louder

After Bies and Hansen

The above table is taken from Professor Colin H Hansen’s publication “Fundamentals of Acoustics” page 41, for the Department of Mechanical Engineering, University of Adelaide.

This table also appears in “Engineering Noise Control” by Colin Hansen and David Bies, a comprehensive reference book, amongst others.

### 6.4 BS 8233:2014, ‘Guidance on sound insulation and noise reduction for buildings’

This revised British Standard relates to the requirements necessary to allow for design of new building or refurbished buildings undergoing a change of use. It provides guidance on acoustic criteria appropriate for several types of internal spaces. The criteria as noted within 7.7.2, internal ambient noise levels for dwellings; are reproduced below:

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 LAeq, 16-hour dB	-
Dining	Dining Room / Area	40 LAeq, 16-hour dB	-
Sleeping (daytime resting)	Bedroom	35 LAeq, 16-hour dB	30 LAeq, 8-hour dB

These criteria are based upon average data and exclude occasional event noise.

The external noise criterion is noted as 50 dB LAeq, T, with the upper guidance value of 55 dB LAeq, T which would be acceptable for noisier environments. It is also noted that these criteria may not be achievable in noisier environments where developments are desirable, such as city centres or urban areas adjoining strategic transport networks. Where this is the case, the development should be designed to achieve the lowest practicable levels for external amenity spaces but should not be prohibited.

## 6.5 Pro-PG Planning and Noise: New Residential Development

Pro-PG Planning and Noise: New Residential Development (Pro-PG) was published in May 2017 by the Association of Noise Consultants, Institute of Acoustics, and the Chartered Institute of Environmental Health.

Stage 2: Element 2 of Pro-PG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (see table above in Section 5.2).

Note 4 to the above table states:

'A guideline value may be set in terms of SEL or LAFmax, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g., bedrooms) good acoustic design can be used so that individual noise events do not normally exceed **45 dB LAFmax more than 10 times a night.**'

Note 5 to the above table states:

'Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g., trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal LAeq target levels should not normally be exceeded, subject to the further advice in Note 7'.

This is consistent with the guidance contained within the PPG, which states that:

'... consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations.'

## 7.0 Survey Equipment

Both remote and short-term noise monitoring was conducted using the following equipment.

### 7.1 Remote Noise Monitoring Equipment

Castle Miras GA117 Sound Level Meter, Serial No 35762

Svantek SV 18 Pre-Amplifier, Serial No 33444

ACO 7052E Microphone, Serial No 71166

Castle GA607 Calibrator, Serial No 039456

Castle GA690 Barometer, Serial No 068449

Weatherproof Housing and external battery

Weatherproof Wind Shield

Tripod

Cabling

Padlock and Chain

### 7.2 Short Term Monitoring Equipment

Svantek Sound Analyser, SV 979, Type 1, Serial No 92932

Svantek SV 17 Microphone Serial No 106523

90mm Windshield

Tripod

Calibration certificates available for inspection upon request.

## 8.0 Survey Method

The writer conducted remote and attended baseline noise monitoring between 27<sup>th</sup> to 30<sup>th</sup> November 2023 to ascertain a representative "Baseline" noise climate for the site in accordance with the requirements of BS4142:2014+A1:2019.

The remote monitoring was conducted at the southern site boundary location with the sound level meter mounted on a tripod and fixed to the boundary fence. This position overlooked the residential premises of Rivendale, Wyndham Place and was placed in line with the western elevation of the property for a period of 3 days.

The attended noise monitoring was conducted at the northern site boundary outside the premises of No 3 East Road for a typical daytime and nighttime period to determine the frequency spectrum of the sound levels experienced due to the pre-existing noise climate. The meter was mounted on the tripod on site at 1.5m above the ground and at least 3m from any reflective surfaces.

$LA_{eq}$ ,  $LA_{10eq}$ ,  $LA_{90}$  and  $LAF_{max}$  indices sound measurements were taken using the sound level meters set to also record a full 1/1 octave band frequency analysis for the duration of the session.

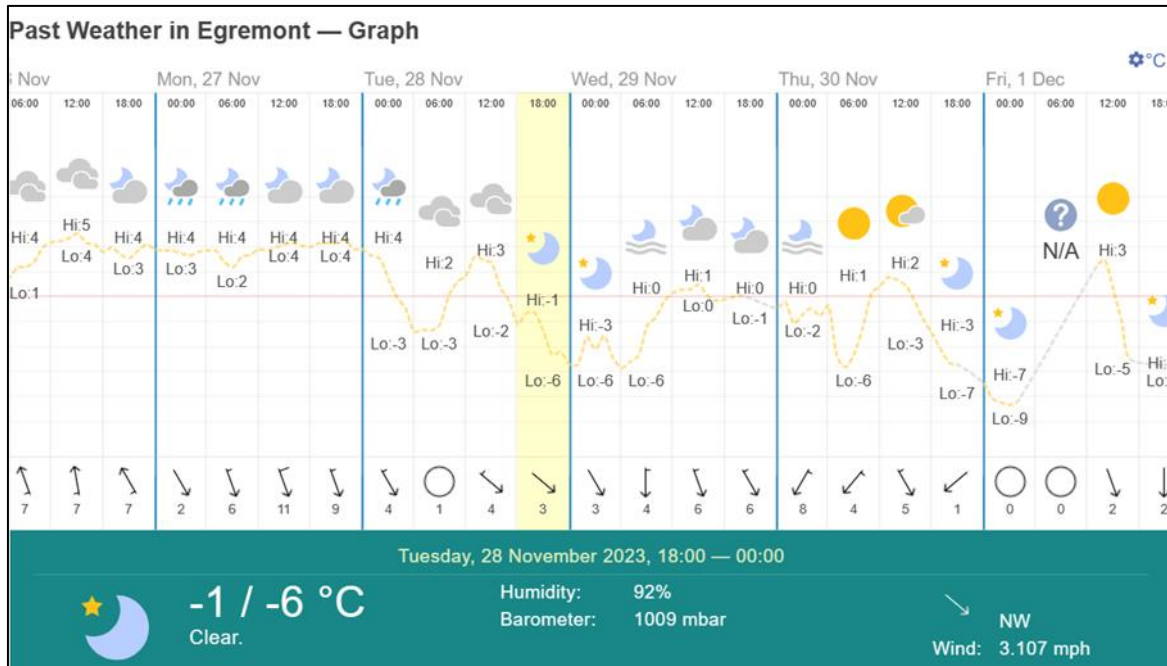
The measurement indices noted above are defined as follows:

$LA_{eq}, T$	the "A" weighted equivalent continuous noise level of sample period T.
$LA_{10}, T$	the "A" weighted level exceeded for 10% of sample period T.
$LA_{90}, T$	the "A" weighted level exceeded for 90% of sample period T.
$LAF_{max}$	The "A" weighted maximum level during the sample period T.

The sound level meter was calibrated before and after the measurements using the calibrator to ensure accuracy of the results. No variations were noted between calibrations and the results obtained can be deemed to be an accurate representation of the levels recorded.

Refer to Appendix A for a marked up locational plan of the existing site and survey positions.

## 9.0 Prevailing Weather Conditions



Weather data courtesy of [www.timeanddate.com](http://www.timeanddate.com)

## 10.0 Noise Survey Results

During the monitoring period noise samples were recorded using a 1/1 Octave Centre Band analysis. These monitoring samples were collected primarily from the northern and southern site boundary locations.

The table of results on the following pages indicate the noise levels recorded for the site during the monitoring period. The above monitoring locations should be read in conjunction with the site layout appearing in Appendix A of this report.

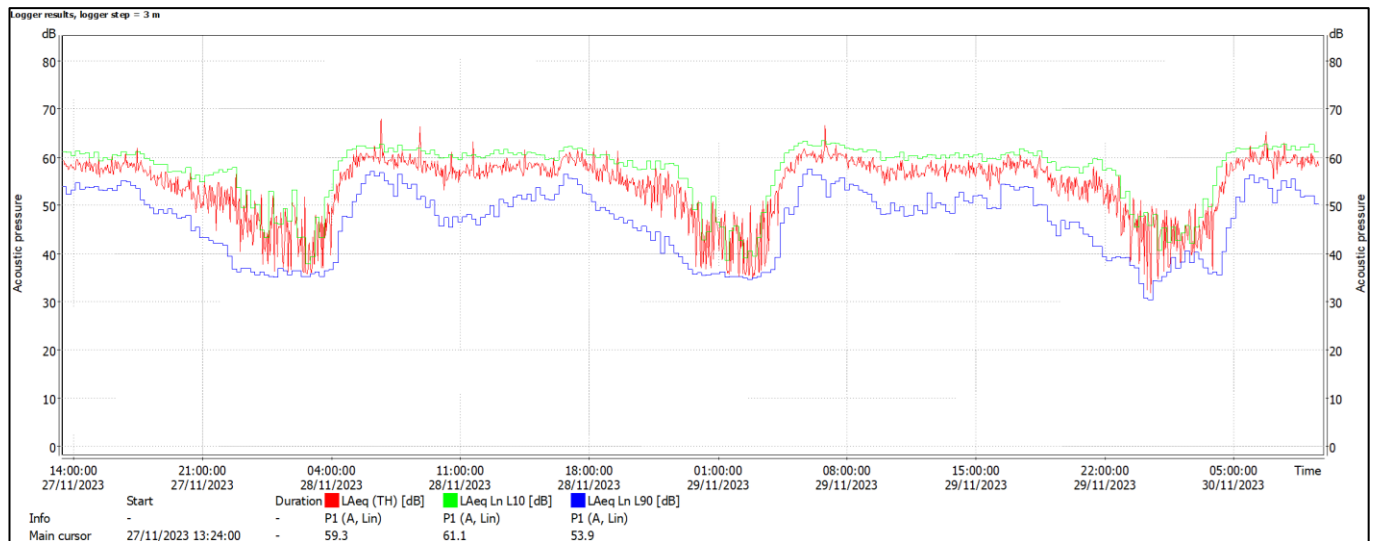
## 11.0 Noise Survey Results Tables

The noise assessment was completed between 27<sup>th</sup> to 30<sup>th</sup> November 2023. Below is an overview table of results, summarising the noise levels recorded.

**Table 1 Noise Measurement Results**

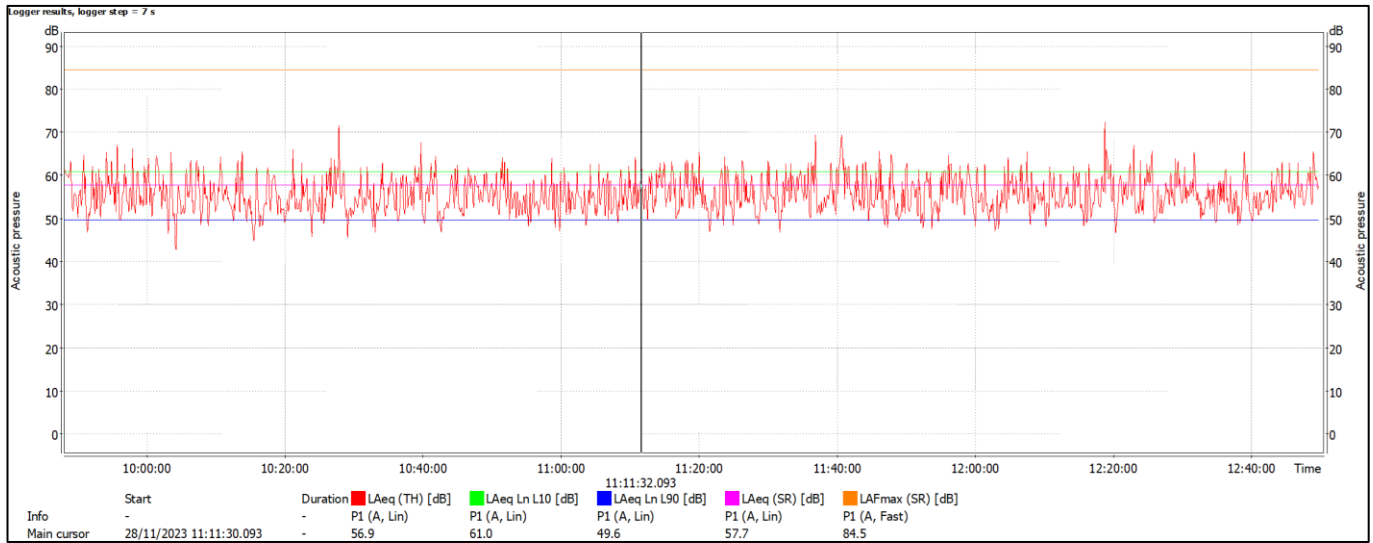
Location	Period		Date	LAeq dB	LAMax dB	11th Highest LAMax dB	LA10 dB	LA90 dB	Source Description
1	Daytime	07.00 - 23.00	27-30.11.23	57.7	84.5	N/A	60.5	51.3	Traffic dominant. Aircraft
	Nighttime	23.00-07.00	27-30.11.23	55.1	84.5	65.6	57.3	49.1	Traffic dominant.
2	Daytime	07.00 - 23.00	28.11.23	57.7	84.5	N/A	61.0	49.6	Traffic dominant. Aircraft
	Nighttime	23.00-07.00	28-29.11.23	47.8	69.5	65.3	49.5	35.5	Traffic dominant.

**Table 2 Remote Monitoring Time History Graph**

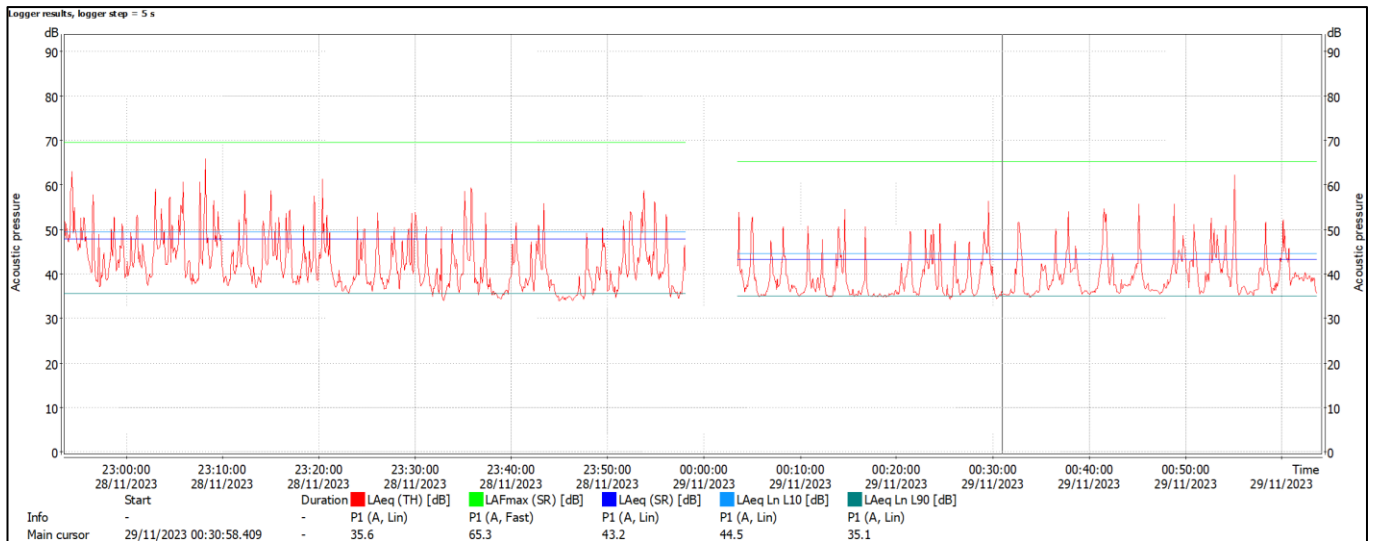




**Table 3 Attended Noise Monitoring Time History Graph – Daytime**



**Table 4 Attended Noise Monitoring Time History Graph – Nighttime**



## 12.0 Results Analysis

The above noise survey, conducted between 27<sup>th</sup> and 30<sup>th</sup> November 2023, was chosen as a representative period to reflect the typical noise climate for the area surrounding the proposed ALDI Egremont site.

The noise survey results obtained for the site can, therefore, be deemed to be representative of normal activities for the area and will be used as the base for analysis and assessment purposes below.

Assessments of the individual results indicate that the monitoring position selected is affected primarily by traffic noise sources from the movements along the A595, Egremont Bypass to the west. Seagulls and both civilian and military aircraft were also a significant contributor to the noise climate.

From the data acquired during the various assessment periods the following exposure noise levels have been established for the site.

**Table of Exposure Levels**

Location	Period	Noise Level
Location 1 Southern Boundary	Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours - 58 dB LA90 – 51 dB
	Night-time (2300 – 0700 Hrs)	LAeq, 8 Hours - 55 dB LAFmax - 66 dB (11 <sup>th</sup> Highest Value) <sup>(1)</sup> LA90 – 49 dB
Location 2 Northern Boundary	Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours - 58 dB LA90 – 50 dB
	Night-time (2300 – 0700 Hrs)	LAeq, 8 Hours - 48 dB LAFmax - 65 dB (11 <sup>th</sup> Highest Value) <sup>(1)</sup> LA90 – 36 dB

(1) As recommended within Pro-PG

## 13.0 Introduced ALDI Noise Sources

The noise sources likely to be introduced resulting from the new ALDI Egremont store fall into 3 main categories.

- 1 Carpark Noise
- 2 Service Yard Noise
- 3 Fixed Plant Noise

Each assessment will deal with the proposed operational or activity period relevant to that specific source.

The actual construction phase of the development will not be assessed during this report.

In the absence of finalised information, the assessments will assume store trading times as follows.

Monday to Saturday	08.00 to 22.00
Sunday	10.00 to 16.00

It is also assumed that ALDI will require servicing availability 24-hours daily to maximise logistics capability.

### 13.1 Impact Assessment of Car Park Noise Sources

Noise from the customer car parking area will be assessed as commercial sources for the purpose of this assessment, and the activity associated with the noise will be restricted to the confines of the site only.

The activities of concern centre on arrival and departure of vehicles, together with associated events such as engine start-up, door slamming etc. To make predictions of the noise level at some distance from the car park, it is first necessary to establish reference noise levels. A series of detailed measurements have been conducted at several ALDI stores, the results of which are summarised in the following table. The results are based upon 1 metre from the activity for ease of comparison.

### 13.1.1 Car Park Noise Sources Table

Activity	Duration, s	L <sub>Aeq, T</sub>	L <sub>Amax</sub>
Drive towards bay, park, switch-off engine, open door, get out and slam door shut	30	69 dB	88 dB
Open door, get in, close door, start engine, reverse out of parking space, drive away to distance	30	73 dB	85 dB

Calculations have been conducted to determine resultant noise levels at the closest noise sensitive receptors to the activities of the carpark area. Consideration has been made to the closest residential premises to the store at No 3 East Road at 35m north of the main car park spaces.

Predicted L<sub>Aeq(1hr)</sub> dB and L<sub>Amax</sub> dB façade noise levels are set out in the table below. Experience indicates that for car park usage during the trading hours, customers will seek to park as close to the store entrance as possible. However, for robustness the car parking spaces nearest to the residential premises have therefore been used as the datum for the predictions. For the purposes of this exercise, consideration of 10 No car parking bays in simultaneous use will be used to predict the noise levels at any noise sensitive receptors.

The relevant topography of the land mean distance and any barriers will be accounted for in the assessments.

The following façade noise levels are calculated taking account of the "on-Time" of the activity defaulted to 1 hour, or 3600 seconds, and the natural attenuation due to distance to the recipient, assuming 20 Log r, dB for sound transmission.

Since there is a line of sight between the car park area and the premises there will be no barrier attenuation applicable.

## 13.1.2 Calculated Car Park Noise Levels – No 3 East Road Premises

Activity	Distance Correction, dB	Barrier Correction, dB	On-Time Period Correction, dB	No of Sources	Calculated Noise Level	
					L <sub>Aeq</sub> , 60 Mins dB	L <sub>A</sub> F <sub>max</sub> dB
Drive towards bay, park, switch-off engine, open door, get out and slam door shut	20 Log (35) = -31	0 dB	10 Log (3600/30) = -21	10 Log (10) = +10	69-41 = 28	88-31 = 57
Open door, get in, close door, start engine, reverse out of parking space, drive away to distance	20 Log (35) = -31	0 dB	10 Log (3600/30) = -21	10 Log (10) = +10	73-41 = 32	85-31 = 54
<b>Cumulative External Total, dB</b>					<b>33 L<sub>Aeq</sub>, 60 Mins</b>	<b>57 dBA Worst Case</b>

The existing daytime periods has been recorded at 50 LA90 dB.

To ensure that there is no loss of amenity, a value -5 dB below the existing background level is a clear indication that noise is not likely to impact upon the premises.

As can be seen from the above the calculated cumulative effect of the customer car park use is 33 LAeq dB. The above calculation of -17 dB below background which indicates that there will be no cumulative increase in background due to the carparking activities and as such no loss of existing amenity.

The proposed residential development beyond the south of the site will not be affected by the ALDI car park activities.

## **13.2 Impact Assessment of Store Servicing Noise Sources**

It is considered appropriate to assess noise from delivery vehicles, unloading of delivery vehicles and pallet returns. The methodology underpinning the assessment of these noise sources is discussed in the following sections.

### **13.2.1 Prediction of Servicing Noise**

It is proposed that access to the store service dock will be obtained from Wyndham Place, via East Road to the north of the site into the car park and onward to the south to the service yard area.

There are two types of deliveries to an ALDI store; Deliveries from local suppliers will take place during normal opening hours and, ALDI own vehicles, which are up to 4 No per day and ALDI prefer unrestricted time periods for these vehicles, where possible, to allow maximum logistics flexibility.

It should be noted at this stage that there is usually only space available for 1 No vehicle to access the store service dock at any one time, therefore, if multiple deliveries are considered for a store they would be on separate occasions and as such there would be no cumulative noise associated with deliveries to the store.

Taking account of the Local Supplier deliveries, usually for bread, milk, and other produce supplies, would take place during normal opening hours and take place either at the loading dock or store entrance. As such these deliveries are usually provided by smaller vehicles and would not impose any additional noise above that already assessed for general customer car park activities. No further assessment of this type of delivery will be necessary.

If we consider the ALDI own delivery vehicle, 4 per day, assumed to be an articulated lorry making use of the loading dock only, we must model the activity in full to determine if the noise generated is acceptable for out of hours periods.

For the purposes of calculations, it is taken that the delivery vehicle will approach the store from the A595 at the west via East Road and onto Wyndham Place. The delivery vehicle will then continue into the car park and then reverse down the loading bay ramp at the southern side of the building such that the rear of the vehicle faces the back of house stores area. Upon completion of the off-loading process the vehicle drives away from the loading dock in a forward direction through the car park and turning onto Wyndham Place, out to East Road and then exit onto the A595.

It is understood that produce will be unloaded onto a dedicated loading dock inside the building. The complete offloading operation varies depending upon the produce being delivered, however, the average time to offload takes approximately 35 minutes.

It is taken that produce cage movements may occur during this unloading activity, however, their movements would be contained within the vehicle trailer only and not exposed to the environment as they are offloaded directly from the vehicle trailer into the store. In addition to the above, the assessment allows for a certain time of general off-loading activities, such as moving plastic pallets, movement of produce, etc. Again, all movements are contained within the trailer or internally within the store, with no external noise sources.

The delivery process can therefore be modelled as several elements, vehicle arrival, unloading and vehicle departure, internal trailer cage movements, and general off-loading activities. Considering arrivals and departures, the path taken by the delivery vehicle has been modelled as a series of straight-line segments to approximate the path travelled by the vehicle. HGV noise emissions have been assumed as constant and independent of vehicle speed since tyre noise is not significant in comparison to noise from the engine and exhaust. Calculations assume point source radiation as the vehicle travels along each segment, with a correction then applied to account for the time of traverse. This approach has been derived from observations of vehicle manoeuvring operations at numerous ALDI stores. Source and receiver heights of 1.5 metres has been used for daytime and nighttime periods (if appropriate), corresponding to the most exposed windows of the nearest receptor to the loading bay.

Regarding unloading, fixed source positions have been taken for both the unloading and the transfer of goods into the store. Point source attenuation has been assumed throughout. Noise levels have been assumed as continuous throughout the entire unloading operation.

A summary of a typical unloading process for a chilled goods delivery, together with the activity noise levels is given in the table below. The data has been taken from our library of activity noise measurements obtained at numerous ALDI sites. The use of reverse horns and cab chiller noise is included within the data gathered for all deliveries and are not isolated event noise sources within the data.

## 13.2.2 Summary of Noise Levels for Servicing Activities

Activity	Typical Event Duration (Seconds)	Mean Distance	LAeq	LAmx
HGV arrives on site	39	10 metres	64 dB	77 dB
Manoeuvre to loading dock	55	10 metres	65 dB	71 dB
Open trailer and loading bay doors	10	25 metres	50 dB	62 dB
Lower ramp to trailer deck	22	25 metres	50 dB	52 dB
Unloading of produce by powered pallet truck, all internally within the delivery trailer to the loading dock.	1200	10 metres	54 dB	65 dB
General offloading activities into store	1200	10 metres	54 dB	65 dB
Raise ramp from trailer deck. Close trailer doors and RSD.	69	25 metres	53 dB	67 dB
HGV departs loading dock	25	10 metres	69 dB	80 dB

Using the table of data above, delivery noise calculations have been conducted for the closest receptor position from this activity. The activities have been taken as the premises located 120m north at No 3 East Road with consideration being made to the premises of Rivendale to the south of the site approximately 40m from the loading dock.

The following façade noise levels are calculated taking account of the "on-Time" of the activity defaulted to 1 hour, or 3600 seconds, for daytime and 15 minutes, or 900 seconds for nighttime periods, and the natural attenuation due to distance to the recipient, assuming  $20 \log r$ , dB for sound transmission correction.



### 13.2.3 Impact Assessment

The assessment locations have been taken as the windows of No 3 East Road to the north and Rivendale to the south, assessed at varying distances from the loading dock.

#### Un-mitigated Store Servicing Results Overview

Location	Daytime Assessment Results LAeq, 1hour dB	Nighttime Assessment Results LAeq, 15 mins dB / LAMax dB
No 3 East Road	33	25 / 60
Rivendale	26	30 / 48

Refer to Appendix C for store servicing calculation details.

As can be seen from the above variance between the daytime and nighttime servicing noise is affected by the reference periods used. The daytime results in a 1-hour contribution of between 26 and 33 LAeq dB, the nighttime assessment results in 15-min contribution assessment values of between 25 and 30 LAeq dB when considered at the closest existing residential premises. Inspection of the results indicate that the unloading process is likely to be contributing the highest individual values for nighttime periods.

When we assess the results against the pre-existing background, we find that the contribution is low when considered outside No 3 East Road for the daytime periods monitored at 50 LA90 dB, representing a value of -17 dB. The nighttime assessments represent a value of -11 dB below the monitored period results of 36 LA90 dB and -5 dB below the 65 LAMax dB value.

If we consider Rivendale to the south the for the daytime periods monitored at 51 LA90 dB, representing a value of -25 dB. The nighttime assessments represent a value of -19 dB below the monitored period results of 49 LA90 dB and -17 dB below the 65 LAMax dB value.

The above calculations indicate that there will be no cumulative increase in background due to the daytime or nighttime servicing activities and as such no loss of amenity for the existing premises located the north and south of the service yard.

## 13.2.4 BS4142:2014+A1:2019 Assessment – No 3 East Road

The following BS4142:2014+A1:2019 assessment is based upon the resultant noise levels determined above. The relevant assessment reference time periods will be used accordingly for the rating, 1-hour daytime and 15-mins nighttime.

Description	Indices	Sound Level Daytime	Sound Level Nighttime	Comments
Resultant Contribution Due to Specific Servicing Process	dBA	33 dB	25 dB	
Residual Sound Level baseline recordings	L <sub>Aeq</sub>	58 dB	48 dB	Traffic dominant source.
Background Noise Level	L <sub>A90</sub>	50 dB	39 dB	Background level consisted of the above.
Proposed specific sound source	L <sub>Aeq</sub>	33 dB	25 dB	Non applicable as this is a calculated value.
Acoustic feature correction when observed at residential premises		+0 dB +3 dB +3 dB	+0 dB +0 dB +0 dB	Intermittency * Tonality ** Impulsivity ***
Rating Level		39 dB	25 dB	
Background Noise Level	L <sub>A90</sub>	50 dB	39 dB	
Excess of Rating over background sound level	Delivery - BG	<b>= -11 dB</b>	<b>= -14 dB</b>	
The excess rating values of -11 dB for daytime and -14 dB for nighttime periods which is below the existing background activities and is classified as not producing any adverse impact due to the servicing process when considered outside the premises of No 3 East Road.				
<p>Uncertainty of the assessment</p> <p>There is uncertainty in the calculation as it is based upon a noise value with a correction applied which may account for a minimal variation in the actual values for the delivery process. The uncertainty is not significant, and the values are in context with the actual area. The measurements presented indicate that the confidence of the rating for the specific source since the values used are based upon monitored data of actual deliveries to comparable sites and the background is based upon measured values during weather conditions considered acceptable for executing measurements.</p>				

The above assessed rating values are based upon un-mitigated site conditions.

Rating values of -11 dB daytime and -14 dB at night are achieving the target values of not exceeding the existing background, and therefore classified as providing no adverse impact and not likely to give rise to justifiable complaints.

## 13.2.5 BS4142:2014+A1:2019 Assessment – Rivendale Premises

The following BS4142:2014+A1:2019 assessment is based upon the resultant noise levels determined above. The relevant assessment reference time periods will be used accordingly for the rating, 1-hour daytime and 15-mins nighttime.

Description	Indices	Sound Level Daytime	Sound Level Nighttime	Comments
Resultant Contribution Due to Specific Servicing Process	dBA	26 dB	30 dB	
Residual Sound Level baseline recordings	L <sub>Aeq</sub>	58 dB	55 dB	Traffic dominant source.
Background Noise Level	L <sub>A90</sub>	51 dB	49 dB	Background level consisted of the above.
Proposed specific sound source	L <sub>Aeq</sub>	26 dB	30 dB	Non applicable as this is a calculated value.
Acoustic feature correction when observed at residential premises		+0 dB +3 dB +3 dB	+0 dB +0 dB +0 dB	Intermittency * Tonality ** Impulsivity ***
Rating Level		32 dB	30 dB	
Background Noise Level	L <sub>A90</sub>	51 dB	49 dB	
Excess of Rating over background sound level	Delivery - BG	<b>= -19 dB</b>	<b>= -19 dB</b>	
The excess rating values of -19 dB for daytime and nighttime periods is below the existing background activities and is classified as not producing any adverse impact due to the servicing process when considered outside Rivendale premises beyond the southern site boundary.				
<p>Uncertainty of the assessment</p> <p>There is uncertainty in the calculation as it is based upon a noise value with a correction applied which may account for a minimal variation in the actual values for the delivery process. The uncertainty is not significant, and the values are in context with the actual area. The measurements presented indicate that the confidence of the rating for the specific source since the values used are based upon monitored data of actual deliveries to comparable sites and the background is based upon measured values during weather conditions considered acceptable for executing measurements.</p>				

The above assessed rating values are based upon un-mitigated site conditions.

Rating values of -19 dB daytime and nighttime are achieving the target values of not exceeding the existing background and are therefore classified as providing no adverse impact and not likely to give rise to justifiable complaints.

The justification for each acoustic penalty is provided below.

- \*Intermittency – No penalty has been applied as the sound is not intermittent in nature when considered against the baseline noise in context.
- \*\*Tonality – A +3 dB tonality penalty has been applied to the assessment since the reverse horns used by ALDI logistics are tonal units producing a pure tone output, however, when observed at the residential premises these tonal horns will be just perceptible when compared against the existing sound scape and as such are in context. Reverse horns would be disabled for nighttime deliveries, therefore, penalty not applicable.
- \*\*\*Impulsivity – A +3 dB impulsivity penalty has been applied as the sound produced by the reverse horns could be perceived as impulsive when compared against the current background noise climate. However, this will only just be perceptible against the current noise climate. Reverse horns would be disabled for nighttime deliveries, therefore, penalty not applicable.

### 13.3 Impact Assessment of Fixed Plant Noise Sources

Fixed plant items associated with an ALDI development usually include refrigeration and ventilation equipment. The following plant items are usually installed within a wire plant cage externally to the store next to the back of house stores area, in this case it will be housed adjacent to the loading dock assembly to the west of the store.

Plant Item	Typical Location	Operational Mode
Condenser Units	Plantroom / Service Yard Area	24-Hours
General Ventilation Fans	Plantroom and Back of House Areas	Variable dependent upon area served. Usually store trading periods.

If we assume that these units are required to serve the chilled produce cases, then it is also feasible to assume that they would operate 24-hours on a demand basis.

Taking account of the plant location to the closest noise sensitive receptors, in this case the existing residents of Old Academy Way to the west, however, the potential residents of the flats proposed for the south are likely to be exposed to noise associated with the operation of the fixed plant. Both locations will be assessed for robustness

Calculations show that for simultaneous operation of the plant will produce resultant noise levels at the receptor as follows for both daytime and nighttime periods.

The activities have been taken as 1m from the facade of the premises with a varying degrees of barrier attenuation, included as applicable.

The following façade noise levels are predicted taking account of the natural attenuation due to distance to the recipient, assuming 20 Log r dB.

A fixed plant installation correction will be applied as necessary.

The noise data for the proposed plant installation at the ALDI Dumbarton site is as follows:

Reference	Plant	Sound Pressure Level Data, dB
A	CLADE Reach-in Pack	44 dBA at 10m
B	CLADE Gas Cooler	45 dBA at 10m
C	CUBO Freezer Unit	44 / 35 dBA at 10m
D	CUBO Chiller Unit	44 / 35 dBA at 10m
E	Vaillant ASHP Unit 1	37 dBA at 10m
F	Vaillant ASHP Unit 2	37 dBA at 10m
G	Vaillant ASHP Unit 3	37 dBA at 10m
<b>Cumulative Resultant</b>		<b>45 dBA at 10m</b>

The resulting calculated cumulative un-mitigated noise level results for all external plant items operating simultaneously when considered at the residential premises is as follows:

### Unmitigated Fixed Plant Results Overview

Location	Un-Mitigated Plant Contribution		Existing Background Level LA90 dB		Variance	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
No 3 East Road	<b>19 dBA</b>	<b>17 dBA</b>	50 dBA	36 dBA	-31 dBA	-19 dBA
Rivendale	<b>43 dBA</b>	<b>37 dBA</b>	51 dBA	49 dBA	-8 dBA	-12 dBA

Refer to Appendix E for details of the un-mitigated plant assessment calculations.

Comparison of the above calculated noise levels due to fixed plant operations with the pre-existing background level of 50 LA90 dB, for daytime and 36 LA90 dB for nighttime periods at noise sensitive premises of No 3 East Road, the result indicates that noise is not an issue with respect to loss of amenity.

The results for the residential premises of Rivendale to the south of the site also indicate that the output levels will be acceptable and not result in any loss of amenity for the occupants, based upon background levels of 51 LA90 dB for daytime and 49 LA90 dB for nighttime periods due to traffic noise along the A595 to the south of the premises.

Based upon the above results no additional mitigation measures will be required for the plant compound to allow the plant to operate 24 hours without giving rise to a loss of existing residential amenity.

### 13.3.1 BS4142:2014+A1:2019 Assessment (Un-Mitigated) – Rivendale

The following BS4142:2014+A1:2019 assessment is based upon the resultant noise levels determined above for the worst case affected residential premises, determined as Rivendale, to the south of the fixed plant compound.

Description	Indices	Sound Level Daytime	Sound Level Nighttime	Comments
Resultant Contribution Due to Specific Fixed Plant	dBA	43 dB	37 dB	
Residual Sound Level baseline recordings	L <sub>Aeq</sub>	58 dB	55 dB	Traffic is the dominant source.
Background Noise Level	L <sub>A90</sub>	51 dB	49 dB	Background level consisted of the above.
Proposed specific sound source	L <sub>Aeq</sub>	43 dB	37 dB	Non applicable as this is a calculated value.
Acoustic feature correction when observed at residential premises		+0 dB +3 dB +0 dB	+3 dB +3 dB +0 dB	Intermittency * Tonality ** Impulsivity ***
Rating Level		46 dB	43 dB	
Background Noise Level	L <sub>A90</sub>	51 dB	49 dB	
Excess of Rating over background sound level	Plant - BG	<b>= -5 dB</b>	<b>= -6 dB</b>	
The excess rating values of -5 dB for daytime and -6 dB at night are below the existing background activities and are classified as not likely to produce any adverse impact due to the fixed plant operations when considered outside the premises of Rivendale to the south.				
<p>Uncertainty of the assessment</p> <p>There is uncertainty in the calculation as it is based upon a noise value with a correction applied which may account for a minimal variation in the actual values for the fixed plant. The uncertainty is not significant, and the values are in context with the actual area. The measurements presented indicate that the confidence of the rating for the specific source since the values used are based upon monitored data of actual fixed plant to comparable sites and the background is based upon measured values during weather conditions considered acceptable for executing measurements.</p>				

The justification for each acoustic penalty is provided below.

- \*Intermittency – A +3 dB penalty has been applied to the nighttime operation of the plant as this as the sound produced by the plant is not steady state and subject to on/off situations likely to result in a minimal intermittent audibility when considered against the baseline noise and context. No penalty has been applied for daytime periods as there is not likely to be any adverse audibility in context the pre-existing background noise climate.

- \*\*Tonality – A +3 dB tonality penalty has been applied to the assessment since the plant is likely to be audible and produce a minimal tonality due to the nature of the plant itself consisting of ventilation equipment and fans. These items will be just perceptible when compared against the existing sound scape and as such is in context.
- \*\*\*Impulsivity – No impulsivity penalty has been applied as the sound produced by the fixed plant as the units operate without any impulsive output.

The above assessed rating values are based upon un-mitigated site conditions.

Rating values of -5 dB daytime and -6 dB at night are achieving the target value of not exceeding the existing background, and therefore classified as not providing any adverse impact or likely to give rise to justifiable complaints.

Based upon these findings no additional mitigation measures will be required to allow 24-hour operation of the plant as the plant will not give rise to any loss of existing amenity for the residential premises of Rivendale positioned to the south of the development.

#### **14.0 Mitigating Noise Control Recommendations**

Accounting for the 3 No specific noise sources likely to be introduced because of the ALDI Egremont store, it can be determined that the above assessments of the general un-mitigated activity noise levels have been assessed as producing noise levels below the design target limits set taking account the pre-existing baseline noise climate for the site.

It has been shown that the store car park will not give rise to any increase in background during daytime operational periods.

The servicing of the store can be completed 24-hours daily without giving rise to any loss of amenity for the nearby residential premises, provided that the reverse warning alarms and trailer chiller cabs are isolated for nighttime deliveries between 23.00 and 07.00 hours.

The fixed plant noise has been assessed and shown to operate below the pre-existing background levels for both daytime and nighttime periods without the need for additional mitigation measures.



## 15.0 Report Summary

This report has assessed the potential noise sources likely to be introduced into the area because of a new proposed ALDI Egremont development.

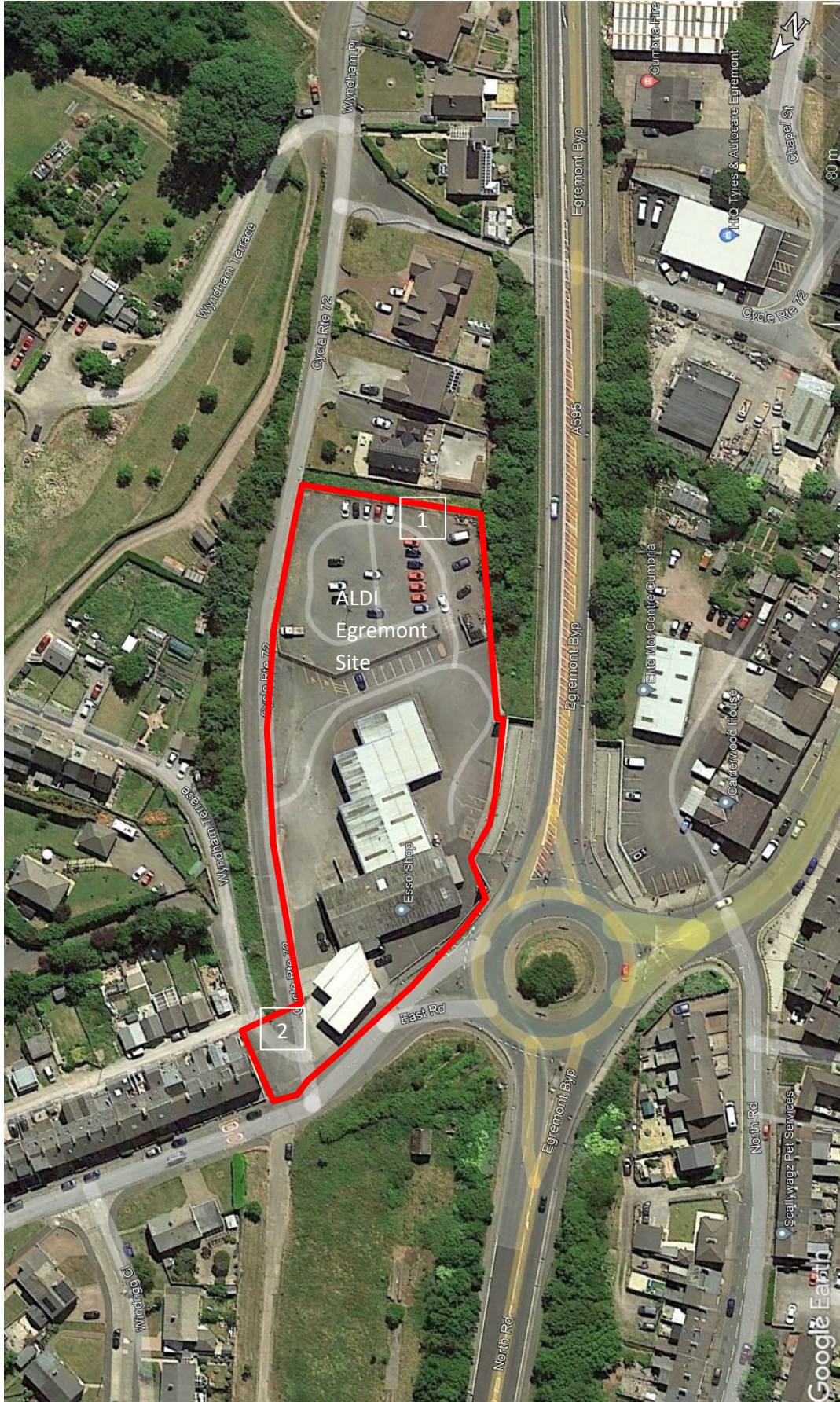
Use has been made of the relevant National and International Standards as well as the monitored noise climate for the area with regards noise and limiting noise levels set for typical site fixed plant, equipment, and activities for both daytime and nighttime periods.

Based upon the results from the baseline noise survey for the area design target noise limits have been utilised for the ALDI Egremont site, for the activity under consideration to the closest noise sensitive positions both existing and potential.

Impact noise assessments have been conducted for the prime sources associated with the ALDI Egremont development. These sources include noise associated with carparking activities, servicing noise and fixed plant and equipment.

It has been concluded that the noise from all introduced sources, following development, are not likely to have a detrimental effect or undue impact on the existing amenity of the closest residents for daytime or nighttime operations as the design target limits have been demonstrated as being achieved.

## Appendix A Existing Site Location Plan and Monitoring Positions





## Appendix B Proposed Site Location Plan



## Appendix C Store Servicing Contribution Calculations (Un-Mitigated)

### Servicing Impact Assessment Calculations

Location - No 3 East Road		Orientation - North			Period - Nighttime						
Activity	Typical Event Duration (Seconds)	Activity Contribution, LAeq dB	Activity Contribution, LAMax dB	Assessment Distance, m	Mean Distance To Recipient, m	Distance Correction, dB	Location Correction, dB	Period Correction to 15 Mins	Barrier Correction dB	Calculated Noise Level	
										LAeq, 15 Mins dB	LAFmax dB
HGV arrives on site and drives towards loading dock	39	64	77	10	100	-20.0	0	-13.6	0	30.4	57.0
Manoeuvre to loading dock	55	65	71	10	130	-22.3	0	-12.1	-10	20.6	38.7
Open loading bay doors	10	50	62	25	130	-14.3	3	-19.5	-10	0.0	37.7
Lower ramp to trailer deck	22	50	52	25	130	-14.3	3	-16.1	-10	12.6	27.7
Unloading of produce by powered pallet truck, all internally within the delivery trailer to the loading dock.	1200	54	65	10	130	-22.3	3	0.0	-10	24.7	32.7
General offloading activities into store	1200	54	65	10	130	-22.3	3	0.0	-10	24.7	32.7
Raise ramp from trailer deck	69	53	67	25	130	-14.3	3	-11.2	-10	20.5	42.7
HGV departs loading dock	25	69	80	10	100	-20.0	0	-15.6	0	33.4	60.0
<b>Resultant Nighttime Contribution</b>										<b>24.7</b>	<b>60.0</b>

Location - Rivendale		Orientation - South			Period - Nighttime						
Activity	Typical Event Duration (Seconds)	Activity Contribution, LAeq dB	Activity Contribution, LAMax dB	Assessment Distance, m	Mean Distance To Recipient, m	Distance Correction, dB	Location Correction, dB	Period Correction to 15 Mins	Barrier Correction dB	Calculated Noise Level	
										LAeq, 15 Mins dB	LAFmax dB
HGV arrives on site and drives along access road	39	64	77	10	75	-17.5	0	-13.6	-15	17.9	44.5
Manoeuvre to loading dock	55	65	71	10	40	-12.0	0	-12.1	-15	25.8	44.0
Open loading bay doors	10	50	62	25	40	-4.1	3	-19.5	-15	0.0	42.9
Lower ramp to trailer deck	22	50	52	25	40	-4.1	3	-16.1	-15	17.8	32.9
Unloading of produce by powered pallet truck, all internally within the delivery trailer to the loading dock.	1200	54	65	10	40	-12.0	3	0.0	-15	30.0	38.0
General offloading activities into store	1200	54	65	10	40	-12.0	3	0.0	-15	30.0	38.0
Raise ramp from trailer deck	69	53	67	25	40	-4.1	3	-11.2	-15	25.8	47.9
HGV departs loading dock along access road	25	69	80	10	75	-17.5	0	-15.6	-15	20.9	47.5
<b>Resultant Nighttime Contribution</b>										<b>30.0</b>	<b>47.5</b>

Location - No 3 East Road		Orientation - North			Period - Daytime						
Activity	Typical Event Duration (Seconds)	Activity Contribution, LAeq dB	Activity Contribution, LAMax dB	Assessment Distance, m	Mean Distance To Recipient, m	Distance Correction, dB	Location Correction, dB	On-time Correction 1-Hour	Barrier Correction dB	Calculated Noise Level	
										LAeq, 1-Hr dB	LAFmax dB
HGV arrives on site and drives along access road	39	64	77	10	100	-20.0	0	-17.5	0	26.5	57.0
Manoeuvre to loading dock	55	65	71	10	130	-22.3	0	-17.4	-10	15.3	38.7
Open loading bay doors	10	50	62	25	130	-14.3	3	-18.6	-10	0.0	37.7
Lower ramp to trailer deck	22	50	52	25	130	-14.3	3	-18.6	-10	10.1	27.7
Unloading of produce by powered pallet truck, all internally within the delivery trailer to the loading dock.	1200	54	65	10	130	-22.3	3	-18.2	-10	6.5	32.7
General offloading activities into store	1200	54	65	10	130	-22.3	3	-18.2	-10	6.5	32.7
Raise ramp from trailer deck	69	53	67	25	130	-14.3	3	-18.3	-10	13.4	42.7
HGV departs loading dock along access road	25	69	80	10	100	-20.0	0	-17.2	0	31.8	60.0
<b>Resultant Daytime Contribution</b>										<b>33.1</b>	<b>60.0</b>

Location - Rivendale		Orientation - South			Period - Daytime						
Activity	Typical Event Duration (Seconds)	Activity Contribution, LAeq dB	Activity Contribution, LAMax dB	Assessment Distance, m	Mean Distance To Recipient, m	Distance Correction, dB	Location Correction, dB	On-time Correction 1-Hour	Barrier Correction dB	Calculated Noise Level	
										LAeq, 1-Hr dB	LAFmax dB
HGV arrives on site and drives along access road	39	64	77	10	75	-17.5	0	-17.5	-15	14.0	44.5
Manoeuvre to loading dock	55	65	71	10	40	-12.0	0	-17.4	-15	20.5	44.0
Open loading bay doors	10	50	62	25	40	-4.1	3	-18.6	-15	0.0	42.9
Lower ramp to trailer deck	22	50	52	25	40	-4.1	3	-18.6	-15	15.3	32.9
Unloading of produce by powered pallet truck, all internally within the delivery trailer to the loading dock.	1200	54	65	10	40	-12.0	3	-18.2	-15	11.7	38.0
General offloading activities into store	1200	54	65	10	40	-12.0	3	-18.2	-15	11.7	38.0
Raise ramp from trailer deck	69	53	67	25	40	-4.1	3	-18.3	-15	18.6	47.9
HGV departs loading dock along access road	25	69	80	10	75	-17.5	0	-17.2	-15	19.3	47.5
<b>Resultant Daytime Contribution</b>										<b>25.6</b>	<b>47.5</b>

## Appendix D Fixed Plant Contribution Calculations (Un-Mitigated)

Un-Mitigated Fixed Plant Calculation - Rivendale Premises.

Reference	Plant Item	Plant noise data, dBA, at 10m		Location Correction		Distance, m	Distance Correction		Natural Barrier Correction		Resultant Plant Contribution	
		day	night	day	night		day	night	day	night	day	night
1	Clade Reach-in Unit	44	44	6	6	29	-9	-9	-12	-12	29	29
2	Clade Gas Cooler	45	45	6	6	25	-8	-8	-12	-12	31	31
6	Chiller 1 - Day Noise	44	-	6	6	20	-6	-6	-6	-6	38	-
6	Chiller 1 - Night Setback	-	35	6	6	20	-6	-6	-6	-6	-	29
7	Chiller 2 - Day Noise	44	-	6	6	18	-5	-5	-5	-5	40	-
7	Chiller 2 - Night Setback	-	35	6	6	18	-5	-5	-5	-5	-	31
3	Heat Pump 1	35	35	6	6	23	-7	-7	-10	-10	24	24
4	Heat Pump 2	35	35	6	6	23	-7	-7	-10	-10	24	24
5	Heat Pump 3	35	35	6	6	22	-7	-7	-10	-10	24	24
<b>Cumulative Plant Contribution dBA</b>											<b>43</b>	<b>37</b>
											<b>DAY</b>	<b>NIGHT</b>

Un-Mitigated Fixed Plant Calculation - No 3 East Road Premises.

Reference	Plant Item	Plant noise data, dBA, at 10m		Location Correction		Distance, m	Distance Correction		Natural Barrier Correction		Resultant Plant Contribution	
		day	night	day	night		day	night	day	night	day	night
1	Clade Reach-in Unit	44	44	6	6	138	-23	-23	-15	-15	12	12
2	Clade Gas Cooler	45	45	6	6	138	-23	-23	-15	-15	13	13
6	Chiller 1 - Day Noise	44	-	6	6	138	-23	-23	-15	-15	12	-
6	Chiller 1 - Night Setback	-	35	6	6	138	-23	-23	-15	-15	-	3
7	Chiller 2 - Day Noise	44	-	6	6	138	-23	-23	-15	-15	12	-
7	Chiller 2 - Night Setback	-	35	6	6	138	-23	-23	-15	-15	-	3
3	Heat Pump 1	35	35	6	6	138	-23	-23	-15	-15	3	3
4	Heat Pump 2	35	35	6	6	138	-23	-23	-15	-15	3	3
5	Heat Pump 3	35	35	6	6	138	-23	-23	-15	-15	3	3
<b>Cumulative Plant Contribution dBA</b>											<b>19</b>	<b>17</b>
											<b>DAY</b>	<b>NIGHT</b>