



Acoustic Survey and Assessment for Proposed Residential development on land at Higher College Farm, Blackburn Road, Longridge, PR3 2YY.

Prepared for:

PWA Planning Ltd
2 Lockside Office Park,
Lockside Road,
Preston,
PR2 2YS

February 2019



Contents

1. Introduction	3
Site Location and Context	3
2. Policy and Guidance	4
3. The Assessment	9
4. Conclusion	16
Figure 1 – Aerial Photograph	17
Figure 2 – Indicative Layout Plan	18
Figure 3 – Monitoring Locations	19
Appendix A – Full Monitoring Results	20
Front (North) of site	20
Rear (South) of site	22



1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic survey and assessment to support a planning application for a residential development on land at Higher College Farm, Blackburn Road, Longridge, PR3 2YY, consisting of 21 self-build properties.

Site Location and Context

- 1.2. The site is located to the west of Longridge. To the north is Blackburn Road and beyond Spade Mill Reservoir. To the west agricultural field and to the east agricultural fields although an outline planning permission has been granted permission in September 2017 for B1, B2 and B8 industrial units, planning application 3/2017/0317. To the south is an existing farmhouse and beyond are existing commercial/industrial units utilised as a meat processing plant.
- 1.3. An aerial photograph is shown in Figure 1 with an indicative layout plan in Figure 2.
- 1.4. It is the potential impact on the proposed residential properties from the passing traffic, the existing units and the proposed units that has raised concerns over the development and the reason why this report has been commissioned.



2. Policy and Guidance

- 2.1. The impact of noise can be a material consideration in the determination of planning applications. The planning system has the task of guiding development to the most appropriate locations. It is recognised that on occasions it will be difficult to reconcile some land uses, such as housing, hospitals or schools, with other activities that generate high levels of noise. However, the planning system is tasked to ensure that, wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail and air transport and certain types of industrial development).
- 2.2. The Government's publication of the National Planning Policy Framework (NPPF), updated in February 2019, states that planning policies and decisions should prevent new and existing development from contributing to or being put at unacceptable risk from, of being adversely affected by unacceptable levels of noise pollution.
- 2.3. The Government have also issued the Noise Policy Statement for England (NPSE). The NPSE clarifies the Government's underlying principles and aims in relation to noise and sets a vision to promote good health and a good quality of life through the effective management of noise while having regard to the Government's sustainable development strategy. The NPSE aims to mitigate and minimise adverse impacts on health and quality of life through the effective management and control of noise.
- 2.4. The NPSE introduces the following terms although no sound levels are given to represent these many authorities including those within Lancashire have identified the sound level criteria in line with the World Health Organisation, BS8233:2014 and BS4142: 2014 levels. The terms introduced by the NPSE are:
- NOEL – No Observed Effect Level (<30dB(A) inside <50dB(A) outside, 10dB below background)
- LOAEL – Lowest Observed Adverse Effect Level (30-35dB(A) inside 50-55dB(A) outside, background to +5dB)
- SOAEL – Significant Observed Adverse Effect Level (>35dB(A) inside, >55dB(A) outside, >+10dB above background)
- 2.5. The sound levels within the brackets of the previous paragraph are those determined by Lancashire authorities as appropriate levels to indicate the relevant effect levels represented by the NPSE. These levels are detailed within the Lancashire Planning



Guidance document on noise which is in the process of being finalised and is currently used by a number of Lancashire authorities.

- 2.6. Other commonly used examples of standards utilised by Local Planning authorities for the consideration of noise impacts include comparison of the likely noise levels to be experienced at a development, with levels that have been recommended by the World Health Organisation (WHO) as Guidelines for the prevention of Community Noise Annoyance and within BS8233: 2014.
- 2.7. The WHO recommended noise levels for outdoor amenity areas (gardens) that should not be exceeded are 55dB(A) $L_{Aeq,16hr}$ in order to avoid 'Serious Community Annoyance' or 50dB(A) $L_{Aeq,16hr}$ to avoid 'Moderate Community Annoyance' during the day. For indoor levels WHO set 35dB(A) $L_{Aeq,16hr}$ during the day to prevent Moderate Annoyance and 30 dB(A) $L_{Aeq,8hr}$ at night to prevent sleep disturbance.
- 2.8. The WHO guidance also recommends that maximum sound levels at night should not regularly exceed 45dB(A) within bedrooms to prevent sleep disturbance. Regularly is considered to be more than 10 times during any 8-hour night time period.
- 2.9. BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' also specifies desirable noise levels to be achieved inside dwellings.
- 2.10. BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' also specifies desirable noise levels to be achieved inside dwellings. BS 8233 presents two levels, the first between the hours of 07:00 – 23:00 and the second between 23:00 -07:00.
- 2.11. The daytime period suggests internal noise levels of 35dB $L_{Aeq,16hr}$, for resting in living rooms and bedrooms while for night time a level of 30dB $L_{Aeq,8hr}$ is recommended. Criteria for external areas mirrors that within the WHO guidance.
- 2.12. Another commonly used standard is British Standard 4142:2014 'Method for rating industrial and commercial sound' compares the sound predicted by the source in question against the background, LA90 sound levels.



- 2.13. The "residual" LAeq measurement is then subtracted from the "ambient" LAeq measurement (with the sound source) to calculate the sound level created by the "problem" sound alone -termed the "specific" sound level.
- 2.14. If the "problem" sound is tonal, such as whine or hum, or if it is impulsive such as bangs or clatters or if it is irregular enough to attract attention a correction is added to the "specific level" to produce the "rating level". The "background" LA90 measurement is then compared against the "rating level".
- 2.15. If the "rating level" exceeds the "background" by around 10dB(A) or more this "indicates a significant adverse impact". A difference of around 5dB(A) 'indicates an adverse impact. The lower the commercial noise level is, the lower the likely impact.
- 2.16. In addition, the recently published 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.17. The first stage consists of an initial noise risk assessment, based on indicative day and night-time *noise* levels. Simple put the higher the ambient noise in an area the greater the impact. The levels given are shown below although it should be noted that these are in excess of both the Lancashire guidance, WHO and BS 8233: 2014.

Noise Risk Category*	Potential Effect if Unmitigated	Pre-Planning Application Guidance
0 – Negligible $L_{Aeq,16hr} < 50dB$ $L_{Aeq,8hr} < 40dB$	May be noticeable but no adverse effect on health and quality of life	In this category the development is likely to be acceptable from a noise perspective, nevertheless a good acoustic design process is encouraged to improve the existing environment and/or safeguard against possible future deterioration and to protect any designated tranquil areas. A noise assessment may be requested to demonstrate no adverse impact from noise. Application need not normally be delayed on noise grounds.
1 – Low $L_{Aeq,16hr} 50-63dB$ $L_{Aeq,8hr} 40-55dB$	Adverse effect on health and quality of life	In this category the development may be refused unless a good acoustic design process is followed and is demonstrated via a Level 1 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised and that a significant adverse impact will not arise in the finished development. Planning conditions and other measures to control noise may be required.
2 – Medium $L_{Aeq,16hr} 63-69dB$ $L_{Aeq,8hr} 55-60dB$ $L_{AFmax} > 80dB^{**}$	Significant adverse effect on health and quality of life	In this category the development is likely to be refused unless good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised, and clearly demonstrates that a significant adverse noise impact will not arise in the finished development. Planning conditions and other measures to control noise will normally be required.
3 – High $L_{Aeq,16hr} > 69dB$ $L_{Aeq,8hr} > 60dB$ $L_{AFmax} > 80dB^{**}$	Unacceptable adverse effect of health and quality of life	In this category the development is very likely to be refused on noise grounds, even if a good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement. Applicants are advised to seek expert advice on possible mitigation measures. Advice on the circumstances when the refusal of a new housing on noise grounds should normally be anticipated is included in the ProPG.

2.18. Stage 2, consists of a full assessment of the prevailing ambient noise and is required considered 4 elements to be considered:

- I. Element 1 – Good Acoustic Design
- II. Element 2 – Internal Noise Level Guidelines
- III. Element 3 – External Amenity Area Noise Assessment
- IV. Element 4 – Assessment of Other Relevant Issues

2.19. A good acoustic design is implicit in meeting the requirements of the NPPF and can help to resolve many potential acoustic issues.



2.20. Details of the criteria considered suitable are provided above for both internal and external sound levels. Element 4 includes such issues as local and national policy, likely occupants, wider planning objectives.



3. The Assessment

- 3.1 In order to obtain representative existing sound levels for the area on-site monitoring was undertaken over the 21st -22nd February 2019. The sound level meters were positioned in two locations as indicated in Figure 3. The first location was positioned adjacent to the road to the northeast while the second was located to the southwestern boundary adjacent to the industrial units and access road.
- 3.2 The weather during the monitoring was dry, no wind. The meters were calibrated before and after the monitoring with no deviation. Calibration certificates are available on request.
- 3.3 The full monitoring results are contained within Appendix A but the table below summaries the results obtained.

Front (North)

Start Time	End Time	Duration	L _{Aeq}	L _{A90}	L _{AMax}
21/02/2019 18:00	21/02/2019 19:00	01:00:00	64.7	49.3	81.1
21/02/2019 19:00	21/02/2019 23:00	04:00:00	62.2	36.2	91.5
21/02/2019 23:00	22/02/2019 07:00	08:00:00	57.0	30.9	82.0
22/02/2019 07:00	22/02/2019 18:00	11:00:00	65.5	46.9	100.9

- 3.4. the meter was located by the hedgerow approximately 7.5m from the road. The nearest property is identified on the indicative plan as being 16m from the roadside this would, assuming a line source for the road noise, provide a reduction of 3.3dB to the above measurements.
- 3.5. A review of the maximum sound levels occurring during the evening and night-time periods has been made and are show in Appendix A. These are fairly consistent and relate to passing vehicles along the road, with the evening maximum being in the region of 78.7dB(A) equating to 75.5dB(A) at the façade of the nearest property. The night-time maximum not regularly exceeded was 76.9dB(A) equating to 73.9dB(A) at the façade.
- 3.6. It should also be mentioned that the development is to include highways works which will involve the speed limit along the road being reduced to 30mph. this will also reduce



the sound levels measured and as such the monitoring results are considered to be worse-case levels.

Rear (South)

Start Time	End Time	Duration	L _{Aeq}	L _{A90}	L _{AMax}
21/02/2019 18:00	21/02/2019 19:00	00:59:59	49.2	44.0	65.2
21/02/2019 19:00	21/02/2019 23:00	04:00:00	45.3	36.7	72.0
21/02/2019 23:00	22/02/2019 07:00	08:00:00	44.4	31.1	72.3
22/02/2019 07:00	22/02/2019 18:00	11:00:01	50.8	41.9	76.8

- 3.4 The meter at the rear was located inline with the rear hedgerow and in direct line of sight to the existing industrial units. This is in line with the boundary of the nearest property rear garden, with a further 16m separation distance to the house façade from the industrial unit, equating to a 3dB decrease. The background sound level was dominated by refrigeration plant noise from the unit at 35dB(A) at the monitoring location, with peaks from passing traffic along the main road.
- 3.5 The plant noise, which will equate to 32dB(A) at the façade of the property will not result in any adverse impact.
- 3.6 An open window provides 15dB attenuation¹ and therefore the identified existing sound levels in the area, at the front of the site, by the road, are above those recommended within the guidance documents detailed above and above those levels identified by Ribble Valley Borough Council Environmental Health Officer as acceptable. As such additional mitigation measures will be required for these properties.
- 3.7 To the rear of the site the sound levels are below the recommended levels with the exception of the night-time maximum sound level which is regularly exceeded of 67.1dB(A), linked to passing traffic mainly along the access road to the east.
- 3.8 The proposed industrial development to the east has received outline planning consent and a condition has been attached to the planning permission stating that:

“Applications for the approval of reserved matters shall be accompanied by a noise assessment to ensure that the rating level (L_{Aeq,T}) of noise emitted from the site shall not exceed the background noise level

¹ BS8233: 2014; Guidance on sound insulation and noise reduction for buildings



(LA90,T) by more than 0 dB at any time when measured at the boundary of the nearest noise sensitive premises. The assessment shall have been made in accordance with the current version of British Standard 4142 and the Planning Practice Guidance and confirmation of the findings of the assessment shall have been submitted to, and agreed in writing by, the Local Planning Authority and shall be adhered to thereafter.

If the assessment indicates that noise from the development is likely to affect neighbouring residential or commercial properties then a detailed scheme of noise mitigation measures shall be submitted to and approved in writing by the Local Planning Authority prior to the first occupation of the units.

The noise mitigation measures shall be designed so that nuisance will not be caused to the occupiers of neighbouring noise sensitive premises by noise from the development”.

- 3.9 This condition means that even when taking into account any tonal, impulsive or intermittent noises from the development the existing background sound levels will not be exceeded at nearby properties. As no reserve matters application has been submitted the applicant will need to consider this proposed development within the reserve matters report together with the existing residential properties to the east and the farm house to the south, until such time as this application is decided. As such no further assessment of this site is required beyond that already being undertaken for the general environmental noise in the area.
- 3.10 As identified additional mitigation measures will be required to ensure no adverse impact on the future residents. To the front of the site a reduction of 27.2dB is required during the daytime and 23.7dB(A) at night to ensure the guideline internal sound levels are achieved. For maximum sound levels a reduction of 30dB is required for the evening and 28.9dB at night.
- 3.11 A standard 6/12/6 double glazing unit will provide a sound reduction, $R_w(C;C_{tr})$, of 33(-1;-3). Thus, 30dB for this project. This is more than enough to ensure suitable average internal sound levels are maintained within the property, and to ensure that maximum sound levels do not regularly exceed 45dB(A) $L_{A_{Max}}$.



- 3.12 In order to be able to keep windows closed additional ventilation provision must be made for the property. As such it is recommended that a ventilation system is used incorporating acoustic trickle ventilators for all windows to habitable rooms to the proposed properties. The ventilators must achieve a similar or better performance to the windows when open and a number of suitable models are available from suppliers including the Greenwood DN Vent providing 34dB (C_{tr}) attenuation or the Titon, Trimvent Select Xtra R16 Ventilator providing 30dB (C_{tr}) attenuation. Other models and manufacturers are available.
- 3.13 For external areas the properties themselves will protect the rear amenity areas from the majority of the traffic noise, however further mitigation measures are recommended to ensure that the amenity areas are below 55dB(A) $L_{Aeq,16hr}$ and ideally below 50dB $L_{Aeq,16hr}$. A further reduction of 10.5-15.5dB is required. This can be achieved through the use of a 1.8m close boarded acoustic fence, minimum mass 12Kg/m² to the rear garden areas. This will achieve a reduction of 10.3dB in addition to further distance attenuation of 10dB. The resulting sound level in the rear gardens will be 45.2dB(A).
- 3.14 In relation to the neighbouring industrial development the condition requires that the rating level will not exceed the current background sound level of 46.9dB(A) and therefore will be below the guideline levels and will not result in an adverse impact on the residents.
- 3.15 For those properties in the centre of the site the separation distances from the road side is 45m which equates to a reduction of approximately 12dB. This means that the façade sound level will still be above the guideline levels during the daytime and as such the same glazing and ventilation specification is recommended as detailed above.
- 3.16 It is also recommended that the 1.8m high acoustic fencing is also continued for the garden amenity areas to the boundary of the site to protect the occupants from traffic noise and to provide some security to the properties.
- 3.17 For those properties located to rear of the site the average sound levels to be experienced are within the guideline values and as such no additional mitigation measures are required. However, the night-time maximum sound level regularly exceeded is 67.1dB(A). This has been identified as vehicles on the access road to the



east of the site and would resulting sound level of 52.1dB(A) inside the south-east property.

- 3.18 Therefore, windows to habitable rooms to the rear and eastern façade of the first two properties, units 17 and 18, to the south east of the site will require additional mitigation measures would be required to achieve the requested 45dB L_{Amax} figure. The above glazing and ventilation specifications would be adequate to achieve the required reduction.
- 3.19 The background sound level at the rear of the site is 41.9dB L_{A90} and as such noise generated from the industrial unit will not adverse impact the residents to the rear of the site.
- 3.20 Finally, an assessment of the existing industrial activities has been undertaken for the properties to the rear of the site. A review of the audio recorded during the monitoring has been undertaken and the principle sound source beyond distant traffic, passing vehicles is birdsong throughout the day. It is only during the dead of night that the refrigeration units can be heard and this has been identified at a sound level of 32dB(A) at the proposed façade of the nearest property. Equating to 17dB(A) through an open window.
- 3.21 There is no tonality identified from the monitoring data or the audio recordings, although the plant does periodically switch on/off, with an on time of approximately 45minutes in every hour.
- 3.22 For completeness a BS4142:2014 assessment has been undertaken and is shown below, the background sound level varies over the night-time period. BS4142:2014 identifies that a typical background level should be used and not the lowest observed value taking into account such things as sleeping patterns which means the start and end of the night-time period are more important than the middle of the night as people are trying to get to sleep/waking up.
- 3.23 Average background levels from 05:00 increase rapidly due to traffic in the area up to 40dB(A) between 06:0-07:00 with the quietest levels in the middle of the night being 30-33dB(A). The mean average over the night-time period is 34.0dB(A), and this has been used within the assessment.



Measured Ambient sound level		
Residual Sound level	$L_{Aeq} = 35\text{dB}$	Approximate level in the middle of the night
Background Sound Level	$L_{A90} = 30\text{dB}$	Identified from monitoring results with no plant noise present 03:30
Reference period 15 minutes		Normal ref period,
Specific sound Level	$L_{Aeq} = 32\text{dB}$	Identified from monitoring data and calculated back to façade of nearest property
Acoustic feature	-	No correction applied
Rating level	32dB	
Background sound level	$L_{A90} = 30\text{dB}$	
Excess of Rating level over background level	$(32-30) \text{ dB} = 2\text{dB}$ indicates no significant adverse impact	
Uncertainty		Figures used have been taken from a review of the measured data, the background in particular varies considerably over the night time period and the 30dB is considered to be the lowest background reading.

3.24 The BS4142:2014 assessment suggests that based on the lowest background reading during the middle of the night the existing plant noise is slightly above the background sound level but not an indication of an adverse impact (BS4142 states +5dB for an adverse impact). 2dB difference is not recognisable by the human ear and given the reduction for the glazing will not be identifiable inside the properties.

3.25 In addition, the likelihood of an adverse impact and annoyance to the future residents would be greater at times when they are trying to fall asleep or in the early morning



when they are about to wake. At these times the background sound level is significantly higher than the plant sound level.

3.26 The inclusion of the above glazing and ventilation measures or equivalent to the same specification will be sufficient to achieve the recommended internal sound levels and thus ensure that the future occupants are protected from adverse sound levels from the passing traffic and surrounding industrial activities.

3.27 To confirm the above detailed glazing and ventilation specification will be required to the following plots:

To habitable rooms to the front and side elevations of Units 1-5

To habitable rooms to the rear of units 7-9, 11-14, & 21

To habitable rooms to the rear and side of units 6, 10, & 16-18

3.28 The 1.8m high acoustic fencing is required to the rear garden amenity areas of plots 1-14, 16-18, & 21.



4 Conclusion

- 4.1 Monitoring carried out on site has identified that the existing prevailing sound levels in the area, primarily from the passing traffic and pedestrians, will result in sound levels above the recommended guidance values and as such mitigation measures are required to protect future occupants.
- 4.2 As such in order to achieve the recommended sound levels within the identified guidance in section 2 of the report and to ensure there is a No Observe Effect Level or no adverse impact on the proposed resident's additional mitigation measures have been identified in the form of enhanced glazing with trickle ventilation to the properties, see paragraph 3.27 and a 1.8 acoustic fence to the rear amenity areas, paragraph 3.28.
- 4.3 Sound levels from the existing industrial units will not result in any adverse impact on the future residents and planning conditions imposed on the proposed industrial units to the east will ensure that no adverse impact is experienced.
- 4.4 The above mitigation measures will ensure that no significant adverse impact is experienced in line with the National Planning Policy Framework and as such the proposed scheme would in terms of noise be suitable.

Figure 1 – Aerial Photograph



Figure 2 – Indicative Layout Plan



Figure 3 – Monitoring Locations

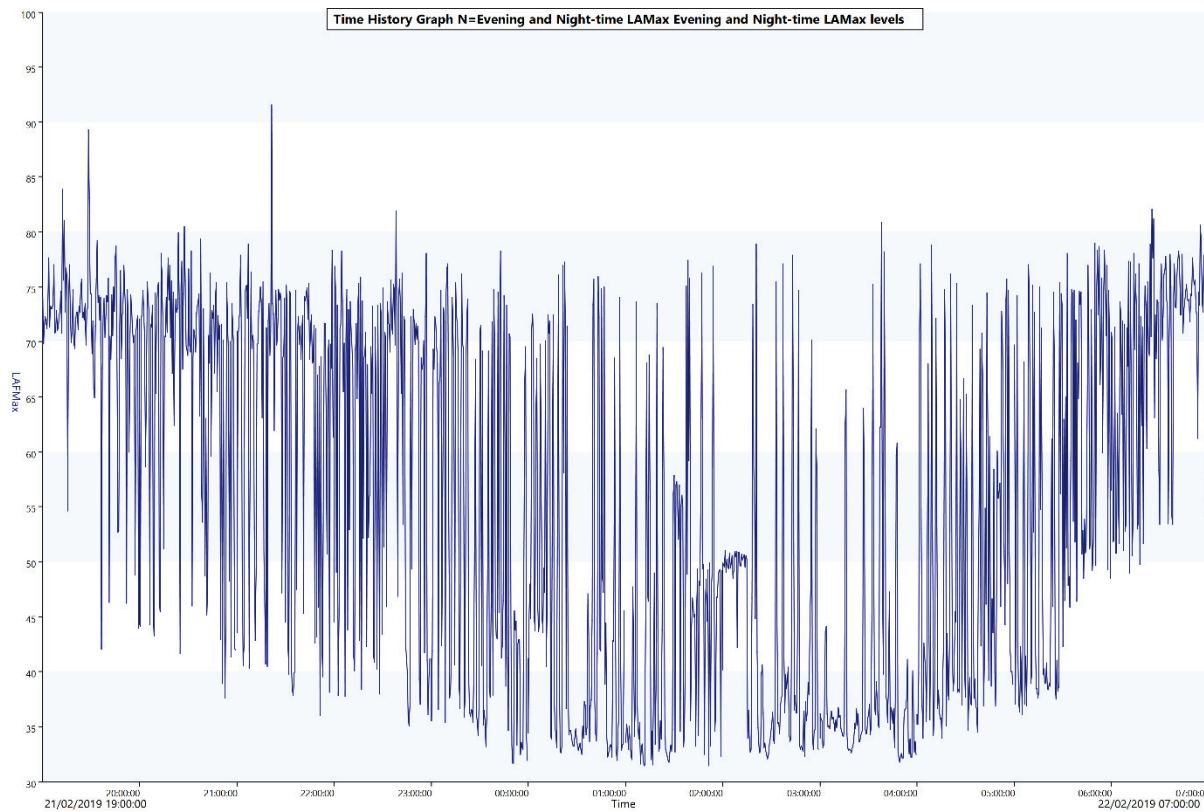




Appendix A – Full Monitoring Results

Front (North) of site

Time	Duration	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
21/02/2019 18:00	01:00:00	64.7	81.1	49.4
21/02/2019 19:00	01:00:00	64.3	89.3	42.5
21/02/2019 20:00	01:00:00	61.6	80.5	37.8
21/02/2019 21:00	01:00:00	61.7	91.5	35.7
21/02/2019 22:00	01:00:00	60.0	81.9	34.4
21/02/2019 23:00	01:00:00	56.7	78.3	30.9
22/02/2019 00:00	01:00:00	54.3	77.2	30.8
22/02/2019 01:00	01:00:00	51.3	77.4	30.3
22/02/2019 02:00	01:00:00	51.5	78.9	30.9
22/02/2019 03:00	01:00:00	50.3	80.9	31.1
22/02/2019 04:00	01:00:00	54.1	78.8	32.5
22/02/2019 05:00	01:00:00	58.5	79.0	35.2
22/02/2019 06:00	01:00:00	62.9	82.0	41.2
22/02/2019 07:00	01:00:00	65.7	82.8	47.3
22/02/2019 08:00	01:00:00	67.9	100.9	48.8
22/02/2019 09:00	01:00:00	65.2	85.1	46.8
22/02/2019 10:00	01:00:00	64.9	82.6	46.4
22/02/2019 11:00	01:00:00	64.8	83.7	45.4
22/02/2019 12:00	01:00:00	64.3	82.3	44.4
22/02/2019 13:00	01:00:00	64.4	83.1	45.8
22/02/2019 14:00	01:00:00	64.7	82.1	47.4
22/02/2019 15:00	01:00:00	65.3	85.4	48.2
22/02/2019 16:00	01:00:00	65.9	86.6	48.2
22/02/2019 17:00	01:00:00	66.2	87.5	49.5





Rear (South) of site

Time	Duration	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
21/02/2019 18:00	01:00:00	49.2	65.2	43.9
21/02/2019 19:00	01:00:00	48.2	63.9	40.8
21/02/2019 20:00	01:00:00	44.0	58.7	37.8
21/02/2019 21:00	01:00:00	43.6	68.1	36.5
21/02/2019 22:00	01:00:00	43.5	72.0	35.1
21/02/2019 23:00	01:00:00	37.0	54.7	30.6
22/02/2019 00:00	01:00:00	35.2	52.4	30.4
22/02/2019 01:00	01:00:00	36.2	53.2	30.4
22/02/2019 02:00	01:00:00	40.8	68.7	34.3
22/02/2019 03:00	01:00:00	41.1	66.0	30.7
22/02/2019 04:00	01:00:00	46.9	69.3	32.1
22/02/2019 05:00	01:00:00	47.7	72.3	36.3
22/02/2019 06:00	01:00:00	48.6	67.8	40.4
22/02/2019 07:00	01:00:00	51.6	70.6	45.4
22/02/2019 08:00	01:00:00	53.1	71.9	45.5
22/02/2019 09:00	01:00:00	50.0	69.2	43.4
22/02/2019 10:00	01:00:00	49.2	70.0	43.1
22/02/2019 11:00	01:00:00	49.1	71.4	42.4
22/02/2019 12:00	01:00:00	49.1	75.7	40.3
22/02/2019 13:00	01:00:00	48.5	71.4	39.9
22/02/2019 14:00	01:00:00	52.5	76.8	41.1
22/02/2019 15:00	01:00:00	53.1	75.9	42.7
22/02/2019 16:00	01:00:00	48.1	70.9	42.2
22/02/2019 17:00	01:00:00	50.4	74.3	43.3

