



DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

APPENDIX 8

NOISE AND VIBRATION

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APPENDIX 8.1

Baseline Noise Measurements

Baseline Noise Measurements

Baseline noise monitoring was undertaken at 10 locations, locations NL1 – NL10, to establish the existing background noise levels at these locations. These locations represent the nearest residential receptors to the north, south, east and west of the proposed wind farm.

Selection of Monitoring Locations

Section 2.2.5 of the Institute of Acoustics', *A Good Practice Guide to the Application of ETUS-R-97 for the Assessment at Rating of Wind Turbine Noise* (2013) regarding use of proxy locations states "When choosing a location that will serve as a proxy for others, the basis for selection is that it can reasonably be claimed, from inspection and observation, to be representative of the non-surveyed locations, in line with the criteria of Section 2.5. Measurement locations outside a property's curtilage (such as an adjacent field) may be used when access to a representative property cannot be obtained, provided that such a location can be justified as being representative. No general guidance can therefore be given on the number of measurement locations as this will be site-specific." Section 2.5 of the GPG is summarised in Table 8-1 with the applicability of the proxy locations selected for Cloonkett Wind Farm.

Table 8-1: IOA GPG Section 2.5 Criteria and Applicability to Cloonkett Wind Farm Monitoring Locations

Requirements of Section 2.5	Cloonkett Wind Farm Monitoring Locations
2.5.1 <i>Where possible, measurements should be made in the vicinity of a dwelling in an area frequently used for rest and recreation.</i>	The IOA CPG criteria were applied where possible, with the exception of the following locations: NL2 was in a field, acting as a proxy location for nearby residential properties. NL3 was in a field near a forested area, representing properties east of the site. NL7 was set up in bog area representing properties to the south of the proposed development. NL10 was at a working farm and represents the closest property to the proposed windfarm at this location.

Requirements of Section 2.5	Cloonkett Wind Farm Monitoring Locations
2.5.2 <i>Equipment should be placed at outdoor positions where noise levels are representative of typical 'low' levels likely to be experienced in the vicinity of a dwelling (or group of dwellings if the measurements are intended to be applied to more than one dwelling). The overriding consideration is that <u>it can reasonably be claimed, from inspection and observation, that there are no other suitable noise-sensitive locations, in the vicinity of any selected location and close to a dwelling, where background noise levels would be expected to be consistently lower than the levels at the selected position.</u></i>	This was adhered to all measurement locations.
2.5.3 <i>Ideally the position should be one which would be exposed to noise from the wind turbines whilst being best-screened from other noise sources such as nearby roads or vegetation.</i>	The locations were in open areas or within the curtilage of a dwelling, set back from local roads and vegetation/ forestry where possible. Locations were chosen to have a direct line of sight to the proposed wind farm development.
2.5.4 <i>The background surveys provide the basis for setting both daytime and night-time noise limits: the measurement position must therefore reasonably represent external areas (for daytime noise) and also building façades containing windows (for night-time noise).</i>	The locations used to derive limits were representative of external areas and façade locations.
2.5.5 <i>In most locations, background noise levels will be determined by wind in trees and vegetation and noise sources external to the property such as traffic noise. The presence of local noise sources such as boiler flues, garden fountains, domestic drains, watercourses and farm equipment should be identified.</i>	There were no observed local sources during equipment deployment and collection which were considered non typical. However, noise levels measured at location NL10 are higher during the daytime as this is a working farm.
2.5.6 <i>Where it is not possible to exclude the influence of variable local noise sources by selection of monitoring position, it is generally possible to identify such data from inspection of noise level time histories and therefore to exclude it from the data set used to derive noise limits</i>	No variable noise sources were noted at monitoring locations during the site visits to install the equipment, change batteries or when equipment collected/removed. Atypical data was removed from data analysis.
2.5.7 <i>In all cases, microphones should be supported at a height of 1.2 – 1.5 metres above the ground and no closer than 3.5 metres to any significant reflecting surface (such as a building or fence), except the ground. The position should be within 20 metres of the dwelling unless there are particular reasons for measuring at a more distant position (such as the presence of vegetation or denial of access); if so, the reasons should be explained.</i>	The microphones were mounted on tripods at approximate height of 1.5 m and at least 3.5 m from any significant reflecting surface other than the ground. Where possible the noise monitors were located within 20 m.

Requirements of Section 2.5	Cloonkett Wind Farm Monitoring Locations
2.5.8 A resident at a selected property may request that measurements are made at a position which is considered inappropriate; perhaps because the preferred location(s) are inconvenient (it might obstruct lawn mowing, for example). In this situation the consultant should explain clearly the reasons why the measurements could be compromised; if no agreement can be reached, an alternative property or location should be sought. The assistance of the EHO may help to resolve these situations.	This was not an issue.

Monitoring Locations

Ten noise monitoring locations were selected for obtaining a detailed baseline the background noise levels in the area. The chosen noise monitoring locations were representative of the different noise environments in the vicinity of the proposed Cloonkett Wind Farm development. Also, they were located at some of the closest dwellings (or their representative proxy locations) to the proposed development.

The noise sensitive locations within the study area, which defines the extent of the area covered by the noise survey is shown in Volume IV, Figure 8.1. Details of the noise monitoring locations are provided in Table 8-2 and noise monitoring locations are shown in Volume IV, Figure 8.2.

Table 8-2: Details on the Noise Monitoring Locations

Location ID	Easting	Northing	Description	Photograph
NL1	520070	660794	Located north of proposed windfarm. This is a proxy location for properties north of the windfarm	Plate 8.1-1
NL2	521834	661609	Located on public land approximately 20m south of the L2070. Proxy location for properties along this road, north of the proposed windfarm.	Plate 8.1-2
NL3	522814	661229	Located east of proposed windfarm, on agricultural land. Nearest noise sensitive location beyond forested area.	Plate 8.1-3
NL4	522758	660642	Located in field adjacent to residential dwelling, immediately at the boundary of the curtilage. South east of proposed windfarm.	Plate 8.1-4
NL5	522389	660181	Located south east of proposed windfarm approximately 27m from property. Forestry plantation to the north.	Plate 8.1-5

Location ID	Easting	Northing	Description	Photograph
NL6	521327	659864	Located in the rear garden of the dwelling facing the proposed wind farm. South of proposed windfarm.	Plate 8.1-6
NL7	519977	659929	Located south west of windfarm within a bog area	Plate 8.1-7
NL8	519395	659876	Located approximately 18m from property, south west of proposed wind farm.	Plate 8.1-8
NL9	518622	660600	Near holiday home, west of the proposed windfarm.	Plate 8.1-9
NL10	519159	660898	North west of proposed windfarm, at farm beside shed	Plate 8.1-10

Location NL1

This location is north of the proposed windfarm. Noise sources noted during setting up the noise monitoring equipment include distant construction noise and birdsong.



Plate A8.1: Monitoring Location NL1

Location NL2

This location is located north and centre of the proposed windfarm. This was located in a field, approximately 20m from the local road L2070, and is a proxy location for properties along this road. During equipment set up, noise sources such as road traffic noise and birdsong was noted.



Plate A8.2: Monitoring Location NL2

Location NL3

This noise monitoring location was located east of the proposed windfarm. The noise monitoring equipment was located in a field. Over 100m east of the noise monitoring location there is a conifer plantation. When the monitoring equipment was set up, noise was noted from distant traffic beyond the trees, to the north east of the monitoring location. Additionally, there was noise from aircraft noted here.



Plate A8.3: Monitoring Location NL3

Location NL4 Located towards the front of property on raised section south east of the proposed windfarm. The monitoring location was approximately 50m from the dwelling façade. The noise monitoring location was chosen as there was a mound at the northern boundary of the property, so the monitoring location had a clear unobstructed view of the proposed windfarm. The monitoring location was chosen away from vegetation, but there are trees in the area. Noise sources observed during equipment set up and removal included birdsong and wind in the trees.



Plate A8.4: Monitoring Location NL4

Location NL5

This noise monitoring location was located south east of the proposed windfarm. There is a forested area to the north of the noise monitoring location. The noise monitoring location was approximately 27m from the property. Noise sources noted during equipment set up and collection include noise from farm vehicles, shed nearby with cattle, construction noise from a nearby house, including banging/hammering. Trees were located to east, in addition to forestry to the north.



Plate A8.5: Monitoring Location NL5

Location NL6 This location was in the rear garden of a house located south of the proposed windfarm. The location was away from a sewage pump to rear of small house, and away from a track leading into field behind house. The monitoring location was near to an overhead line. Noise sources noted during equipment set up and collection included wind in trees and birdsong.



Plate A8.6: Monitoring Location NL6

Location NL7 This location is south west of the proposed windfarm within a bog. Noise sources include distant road traffic noise, aircraft noise and noise from cows. Also, there was noise from distant construction activity at a house. The nearest residential location is to the south at 275m from the monitoring location.



Plate A8.7: Monitoring Location NL7

Location NL8 This location was south west of the site at a farm. The noise monitoring location was 18m from the property. The property is a working farm. The rain gauge was also set up at this location.

When the equipment was set up noise from cows at the farm was noted.



Plate A8.8: Monitoring Location NL8

Location NL9 This location was near to a holiday home at the end of the lane. The location is near a forested area, and is west of the proposed development. Noise sources recorded when the equipment was deployed and collected included birdsong and farm machinery in nearby fields.



Plate A8.9: Monitoring Location NL9

Location NL10 This location was north west of the proposed windfarm. The noise monitoring location was chosen so it had a direct line of sight of the proposed windfarm, beside farm buildings at the property. During the equipment set up noise sources noted included a tractor, cattle housed in a shed and birdsong.



Plate A8.10: Monitoring Location NL10

Measurement Periods

The IOA GPG states *“The duration of a background noise survey is determined only by the need to acquire sufficient valid data over the range of wind speeds. It is unlikely that this requirement can be met in less than 2 weeks.”* If insufficient wind data is collected after two weeks, the monitoring period will be extended subject to acquiring sufficient valid data over the range of wind speeds.

Sufficient data was captured at all monitoring locations from 4th April 2023 to 8th May 2023. A minimum of three weeks’ worth of data was recorded at all monitoring locations, with up to just over 4 weeks at some locations (see Table 8-3 for details).

Definition of Time Periods

The following periods were analysed for this report:

Amenity/Quiet Daytime hours	18:00 – 23:00 Monday to Friday 13:00 – 18:00 Saturday 07:00 – 18:00 Sunday
Night-time hours	23:00 – 07:00

Monitoring Equipment

Baseline noise monitoring was carried out using Class 1 sound level meters: Svantek Svan 977, Svantek 307 and Larson Davis Lxt meters. Details of the noise monitoring equipment are presented in Table 8-3. The sound level meters were fitted with half inch (1/2") microphones. The microphones connected to the Larson Davis sound level meters were made from open-pored polyurethane foam with a diameter of 90mm, surrounded by a secondary windshield. The microphones connected to the Svantek sound level meters were fitted with a single oversized wind shield. This methodology reflects the ESTU W/13/00386/REP, Noise Measurements in Windy Conditions and IOA Good Practice Guidelines, 2013. Calibration certificates for each sound level meter are provided in Appendix 8.2.

A CR800 Series data logger was used to record rainfall (ARG 100) and this was located at NL8; meteorological data was recorded every 10 minutes simultaneously with noise data.

Table 8-3: Details of Noise Monitoring Equipment

Monitoring Location	Meter Type	Serial Number	Measurement Period
NL1	Svantek 307	104990	19/04/23 to 08/05/23
NL2	Larson Davis LxT	6432	05/04/23 to 08/05/23
NL3	Svantek 977	69556	04/04/23 to 08/05/23
NL4	Larson Davis LxT	1612	04/04/23 to 08/05/23
NL5	Larson Davis LxT	5610	04/04/23 to 08/05/23
NL6	Svantek 307	119092	04/04/23 to 08/05/23
NL7	Larson Davis LxT	6600	04/04/23 to 08/05/23
NL8	Svantek 307	119173	04/04/23 to 08/05/23
NL9	Svantek 307	104985	05/04/23 to 08/05/23
NL10	Svantek 977	34876	05/04/23 to 08/05/23

Monitoring Protocol

Baseline noise measurements were undertaken at 10 locations surrounding the proposed wind farm. Equipment was installed in the following lots (as detailed in the Table above):

- 1) from 4th April 2023 to 8th May 2023
- 2) from 5th April 2023 to 8th May 2023
- 3) from 19th April 2023 to 8th May 2023 (shorter measurement due to arranging site access)

The following monitoring protocol was carried out at each of the monitoring locations based on the IOA GPG:

1. The sound level meters were calibrated on-site and set to log L_{A90} statistics on a fast time weighted response every ten minutes.
2. Each sound level meter microphone was mounted at 1.5 m above ground level and fitted with an enhanced windshield. Each microphone was placed at least 3.5 m from reflecting surfaces to obtain 'free field' conditions.

3. Wind speed and wind direction measurements were taken from permanent mast installed on site. Wind speed was measured at a range of heights and data from anemometers at XX m and XX m were used to extrapolate the wind speed data up to a hub height of 82 m.

The standardised 10 m wind speed was obtained from the turbine hub height wind speed by correcting it to 10 m height using a ground roughness factor of 0.05 m. Roughness length (or logarithmic) shear profile:

$$U_1 = U_2 \frac{\ln(H_1/z)}{\ln(H_2/z)}$$

where U_1 is the wind speed to be calculated, U_2 is the measured wind speed, H_1 is the height of the measured wind speed to be calculated (10m), H_2 is the height of the measured wind speed and z is the ground roughness length (m). A roughness length of 0.05m is used to standardise hub height wind speeds to 10m height in the IEC 61400-11:2012 standard.

4. The L_{A90} statistic measurements were synchronised with the 10 m standardised wind speeds derived from the on-site meteorological mast data.
5. A rain gauge with data logger was also installed (at Monitoring Location N8) to record rainfall events over successive 10-minute intervals, also synchronised to the noise level and wind speed measurements.
6. After the monitoring was completed, the noise meters were re-tested using the calibration noise source to ensure that the meters had not drifted.

Analysis of the Baseline Data

Following collection of the site data, the following protocol was used to analyse the baseline data:

1. The raw baseline L_{A90} noise data was reviewed to determine whether there are any periods of non-consistent noise level due to equipment malfunction.
2. The raw noise level data was then correlated with the time synchronised wind speed and rainfall data. Preliminary data analysis was used to remove datasets (L_{A90} , wind speed and occurrence of rainfall event) which contain a rainfall event as these data sets are required to be removed from further analysis in line with best practice as outlined in the IOA Good Practice Guide and Supplementary Guidance Note 2 on Data Processing.
3. The prevailing background noise during daytime periods uses the amenity/quiet daytime hours. The prevailing background noise during night-time periods excludes early morning periods to remove the dawn chorus which is not prevalent through the whole year; data recorded between 04:00 and 07:00 was removed before completing the data analysis.
4. Once the rainfall events were considered, the remaining data was plotted using a wind speed based plot to establish whether there were any data outliers, representing atypical noise sources or events. These data outliers are indicated in Graphs as removed data.
5. The final dataset(s), considered representative of the noise environment, were analysed to ensure that sufficient data remained to provide coverage over the necessary wind speeds. The prevailing background noise trend was not extended beyond the range covered by the data sets. See the following Section 'Data Available for Determination of Prevailing Background Noise Levels' for details.
6. A 'best fit' trend (not higher than a fourth order polynomial) was then derived to present the assumed prevailing background noise level at each monitoring location. See Section 'Results' for details.

Data Available for Determination of Prevailing Background Noise Levels

The requirement for the survey duration is dictated by the range of wind speeds to be collected. The IOA Good Practice Guide to the Application of ETSU-R-97¹ for the Assessment and Rating of Wind Turbine Noise, (May 2013) states that *“As a guideline, no fewer than 200 data points should be recorded in each of the amenity hours and night-time periods with no fewer than 5 data points in any 1 m/s wind speed bin.”*

The Wind Energy Development Guidelines (DoEHLG, 2006) do not provide the specific periods which are represented by daytime and night-time hours, therefore the definitions from ETSU-R-97 are taken as 07:00 to 23:00 hrs for daytime and 23:00 to 07:00 hrs for night-time.

Prevailing background noise levels were derived for daytime periods. The number of datasets at each integer wind speed are shown in Table 8-4.

¹ Department of Trade and Industry (1996), The Assessment and Rating of Noise from Wind Farms Report ETSU-R-97

Table 8-4: Number of Valid Datasets: Noise Monitoring Locations NL1 – NL10 – Daytime

Wind Speed (at standardised 10 m height), m/s	Noise Monitoring Location									
	NL1	NL2	NL3	NL4	NL5	NL6	NL7	NL8	NL9	NL10
0	0	7	7	7	7	7	7	7	7	7
1	20	48	47	48	46	48	48	48	48	46
2	78	117	112	117	117	117	117	115	117	116
3	152	252	249	246	252	252	252	251	251	252
4	148	234	236	233	238	238	238	237	234	233
5	185	276	282	283	284	283	284	283	276	276
6	99	187	193	193	193	192	193	193	187	185
7	70	152	152	152	152	151	152	152	152	152
8	16	66	66	66	66	66	65	66	66	66
9	2	18	18	18	18	17	18	18	18	18
10		9	9	9	9	9	9	9	9	9
11	0	2	2	2	2	2	2	2	2	2
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
Total Number of Data Points	771	1361	1370	1365	1375	1375	1376	1372	1360	1292

Table 8-5: Number of Valid Datasets: Noise Monitoring Locations NL1 – NL10 – Nighttime

Wind Speed (at standardised 10 m height), m/s	Noise Monitoring Location									
	NL1	NL2	NL3	NL4	NL5	NL6	NL7	NL8	NL9	NL10
0	1	1	1	1	1	1	7	1	3	1
1	17	24	24	24	24	24	48	24	34	24
2	47	82	82	82	82	82	117	82	121	82
3	80	130	130	128	130	130	252	130	241	130
4	105	183	172	179	171	183	238	183	330	183
5	166	241	250	247	250	251	284	251	361	241
6	81	165	172	170	175	175	193	175	222	165
7	20	68	74	73	74	74	152	74	92	68
8	1	13	13	13	13	13	66	13	41	13
9	0	4	4	4	4	4	18	4	8	4
10	0	2	2	2	2	2	9	2	3	2
11	0	0	0	0	0	0	2	0	0	0
12	0	1	1	1	1	1	0	1	1	1
13	0	0	0	0	0	0	0	0	0	0
Total Number of Data Points	537	903	913	911	922	926	811	927	903	903

Results

In this section, the prevailing background noise level in dB L_{A90} relative to standardised 10 m height wind speeds are provided for each monitoring location as per the requirements of the IOA GPG. The prevailing background noise level is plotted as a solid line for each daytime and night-time periods at each monitoring location. In all cases, the highest order of polynomial used is a fourth order polynomials provided lines of best fit to the scatter data.

The recorded prevailing noise levels at the 10 noise monitoring locations is presented in Tables 8-6 and 8-7.

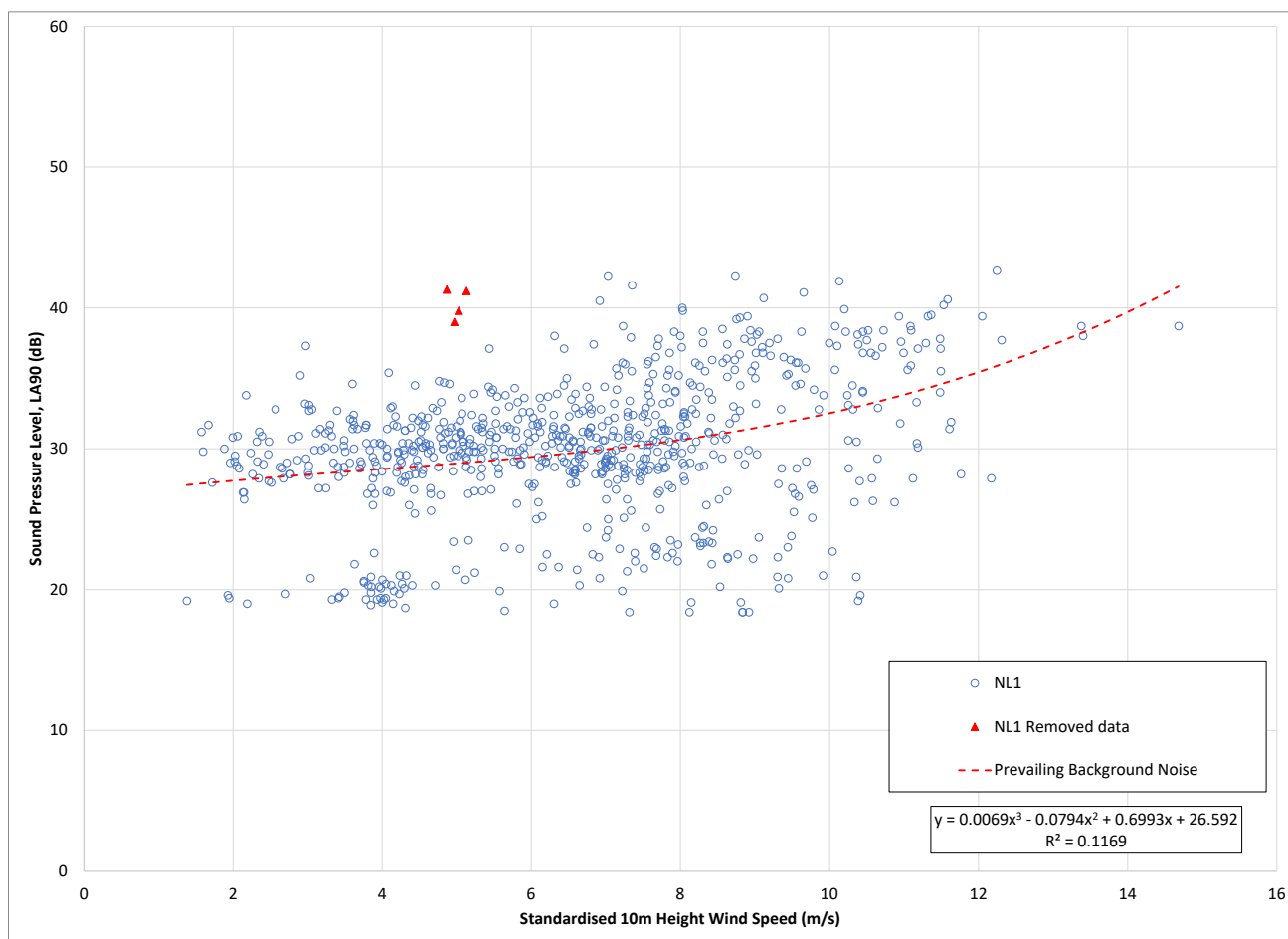


Figure 8-3: Prevailing Daytime Background (L_{A90}) Noise Levels at NL1

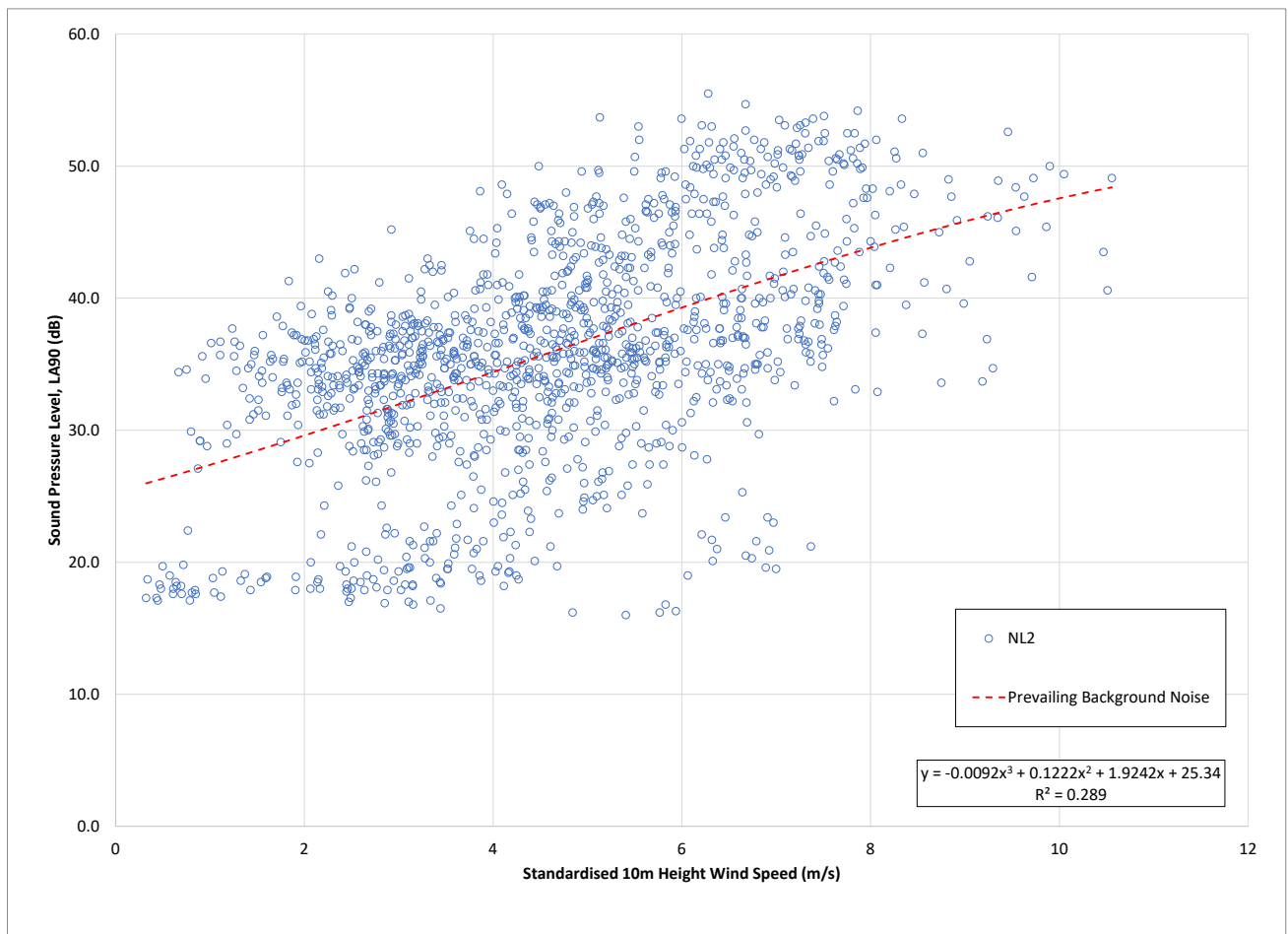


Figure 8.4: Prevailing Daytime Background (L_{A90}) Noise Levels at NL2

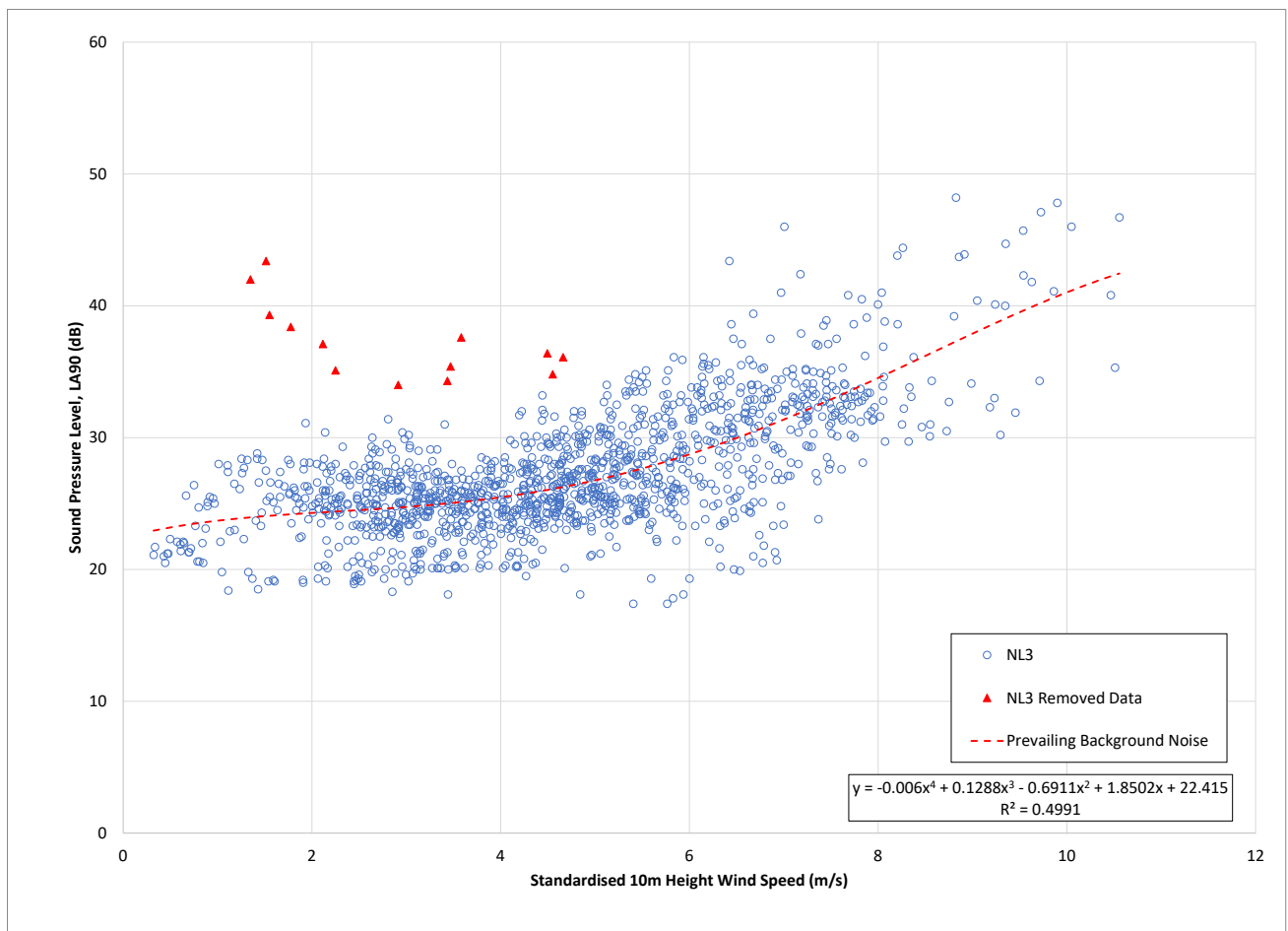


Figure 8.5: Prevailing Daytime Background (LA90) Noise Levels atNL3

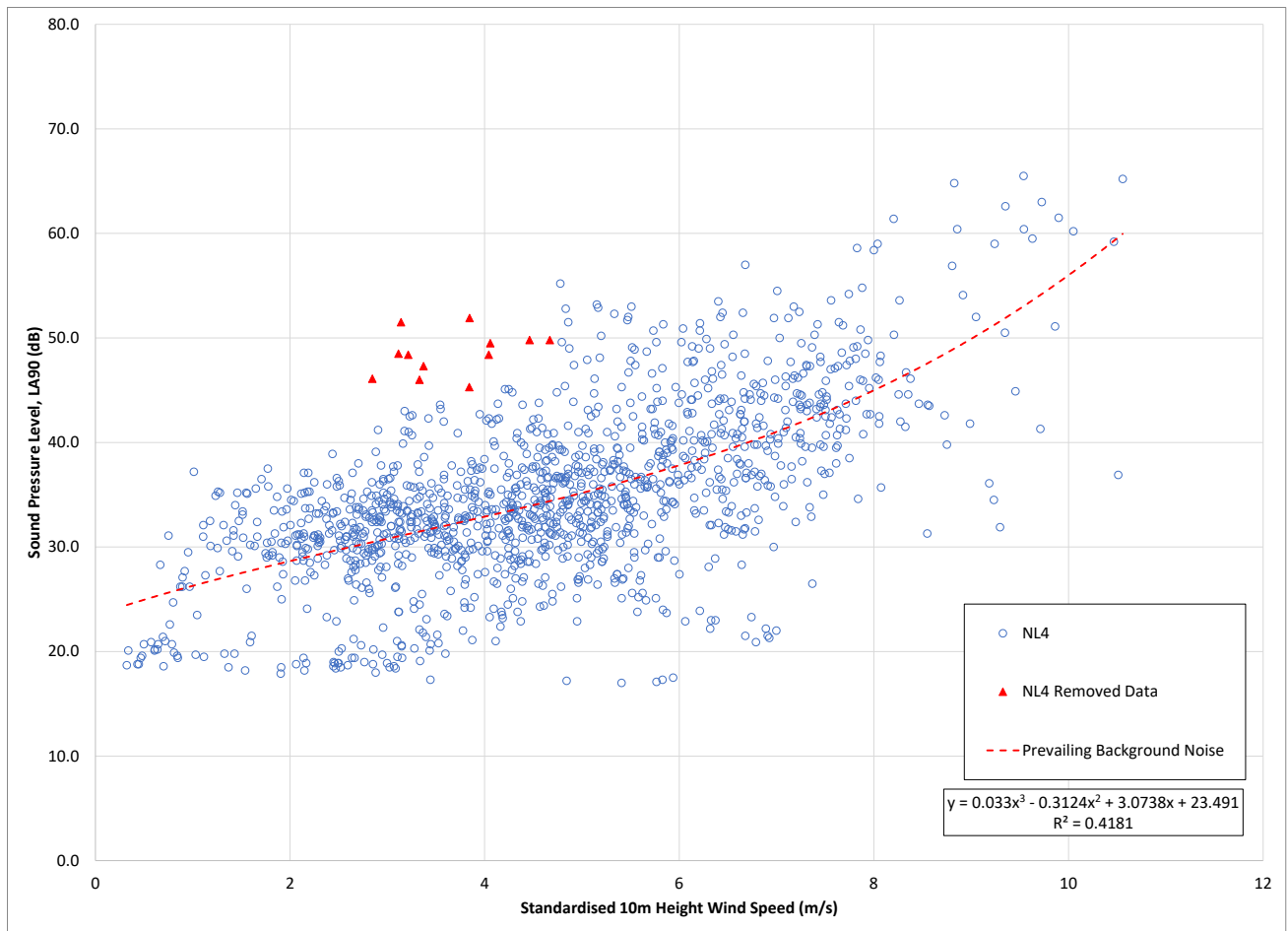


Figure 8.6: Prevailing Daytime Background (L_{A90}) Noise Levels at NL4

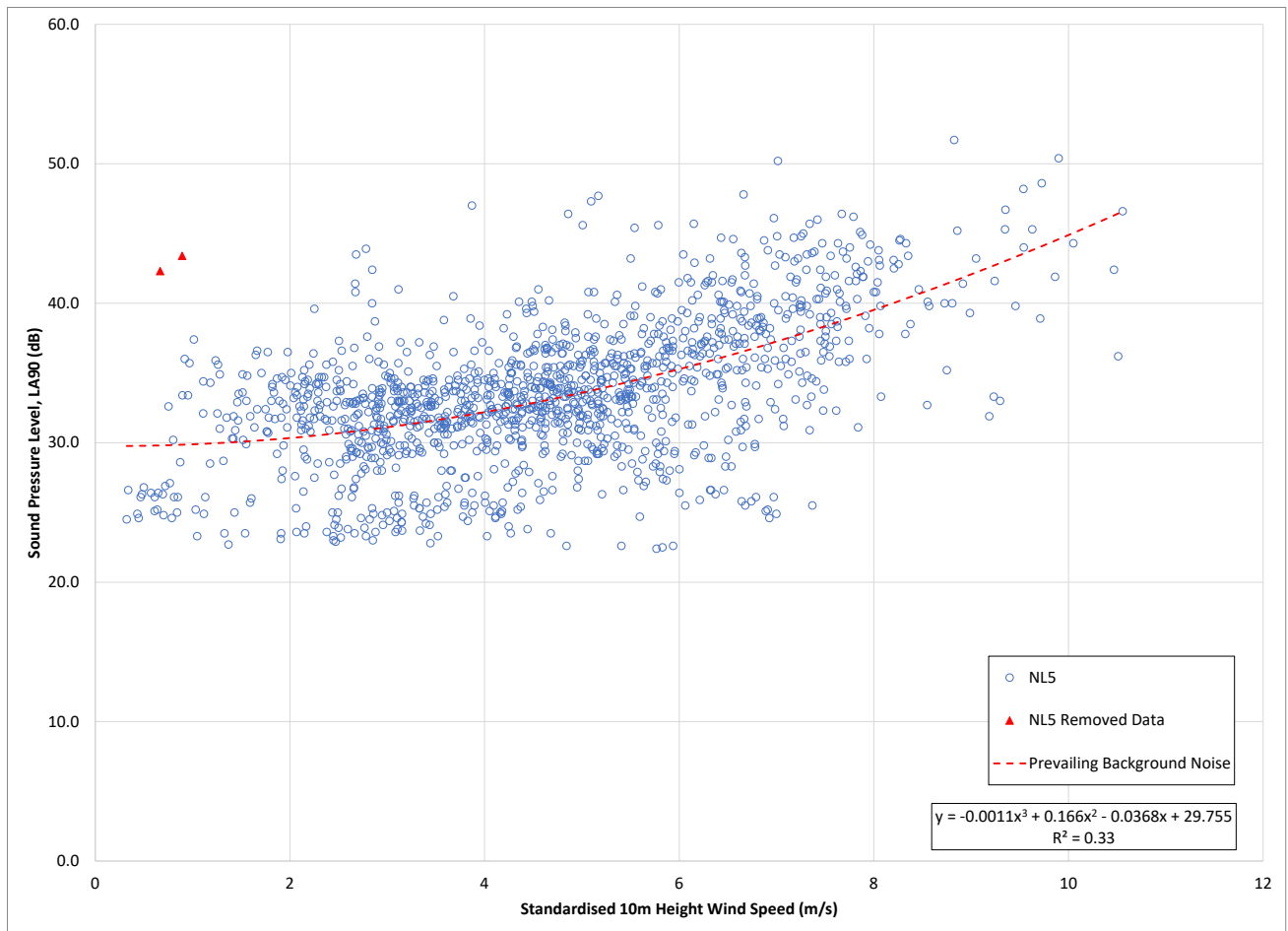


Figure 8.7: Prevailing Daytime Background (LA90) Noise Levels at NL5

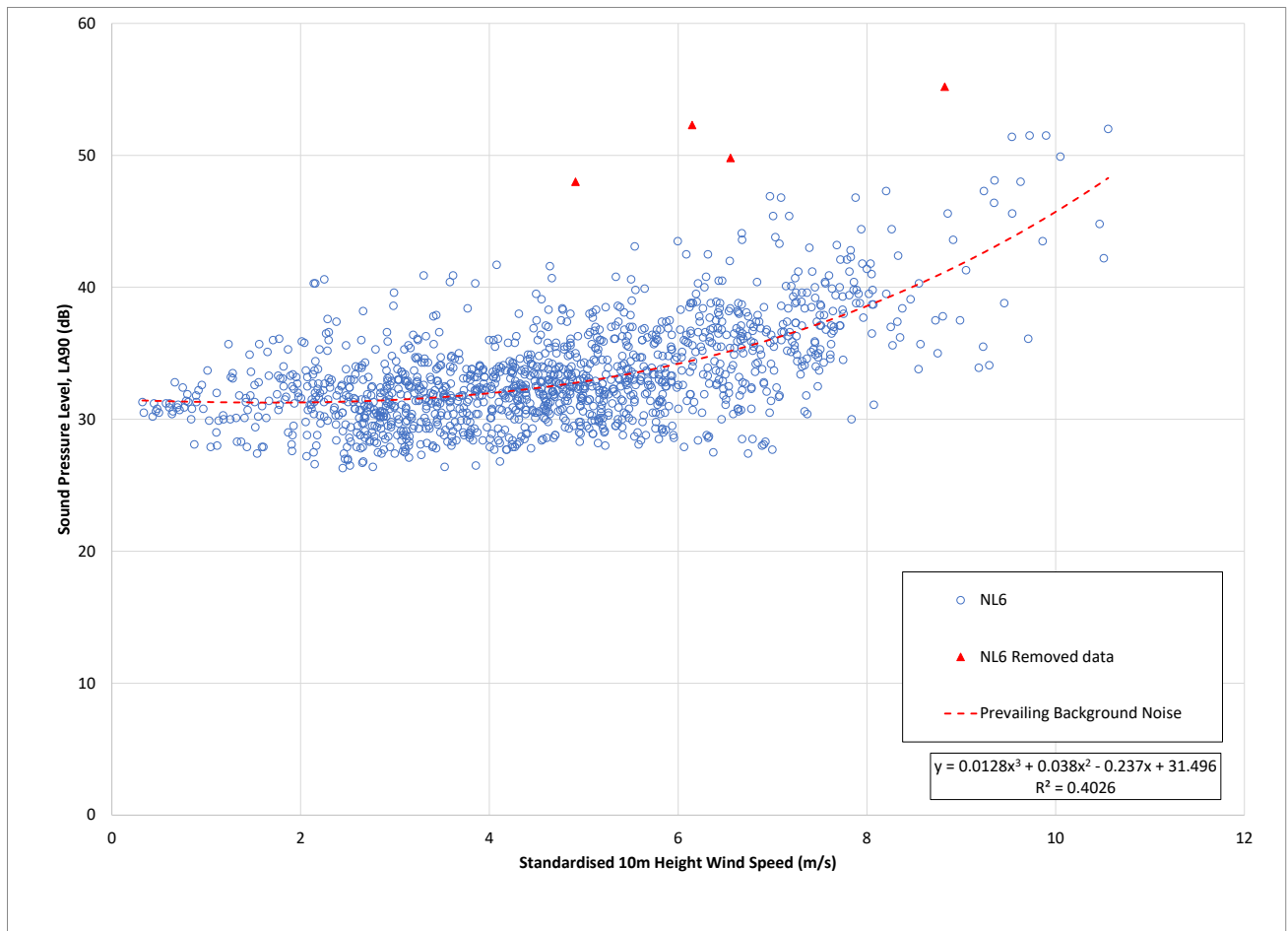


Figure 8.8: Prevailing Daytime Background (LA90) Noise Levels atNL6

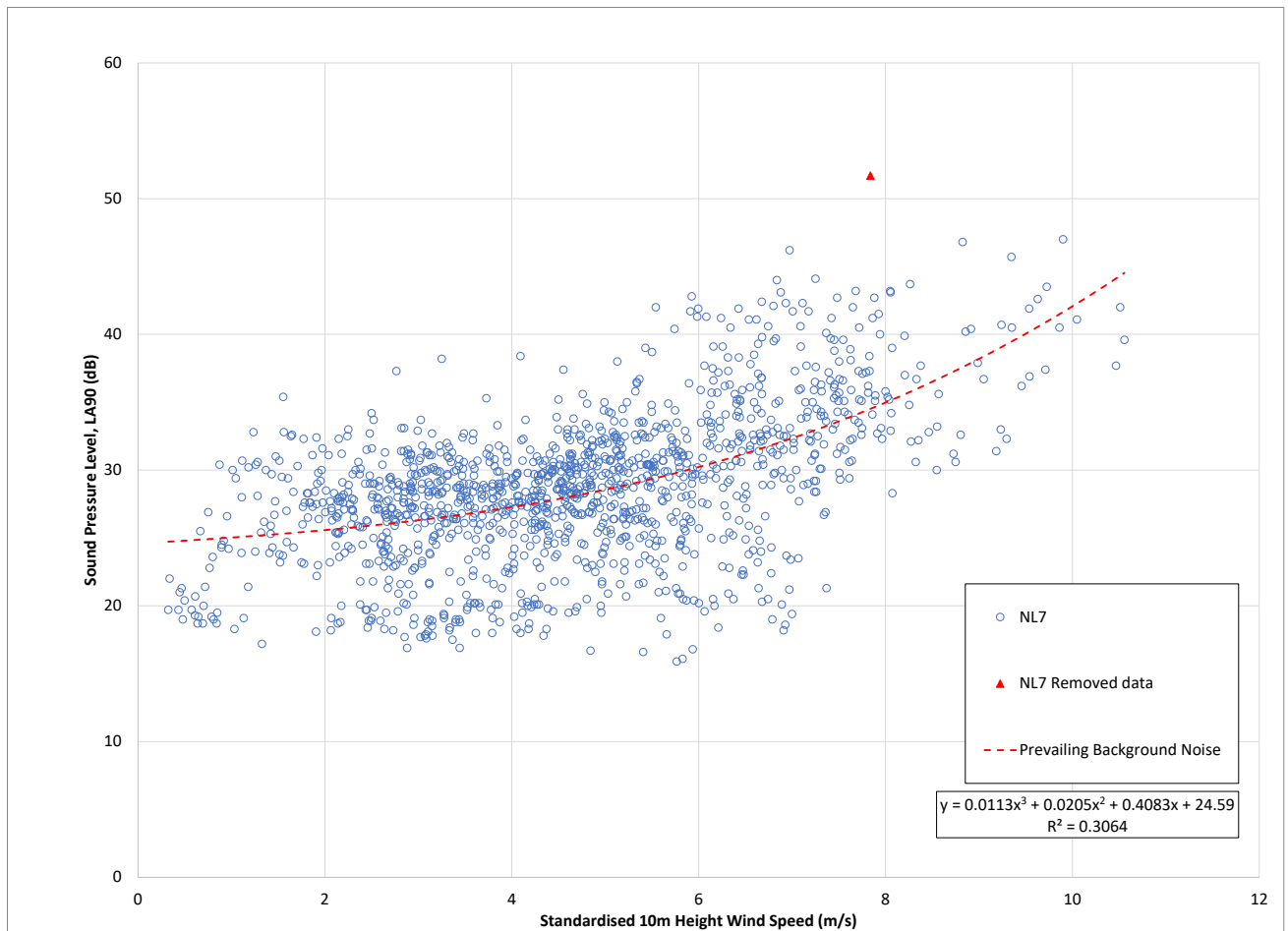


Figure 8.9: Prevailing Daytime Background (L_{A90}) Noise Levels at NL7

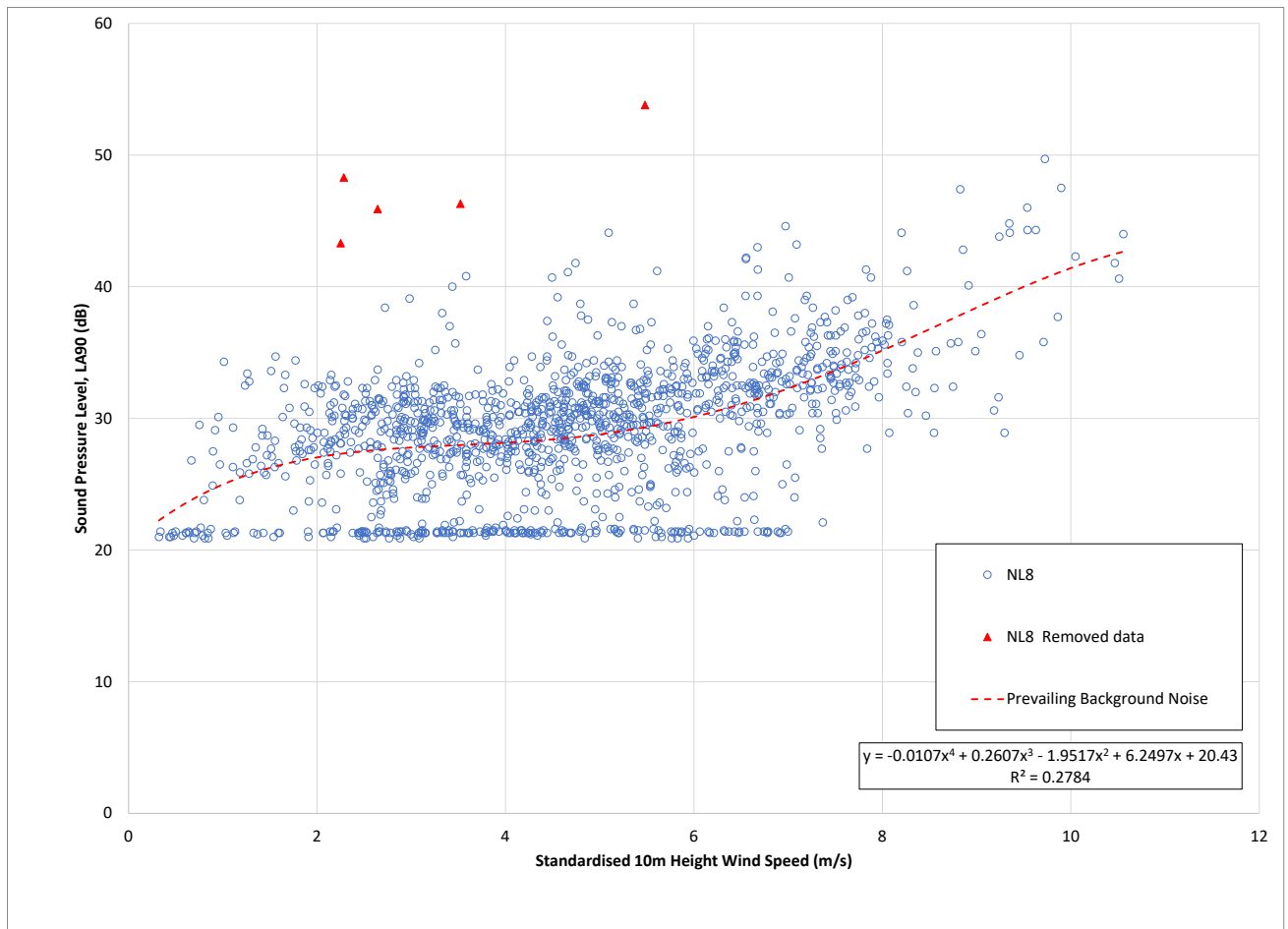


Figure 8.10: Prevailing Daytime Background (LA90) Noise Levels at NL8

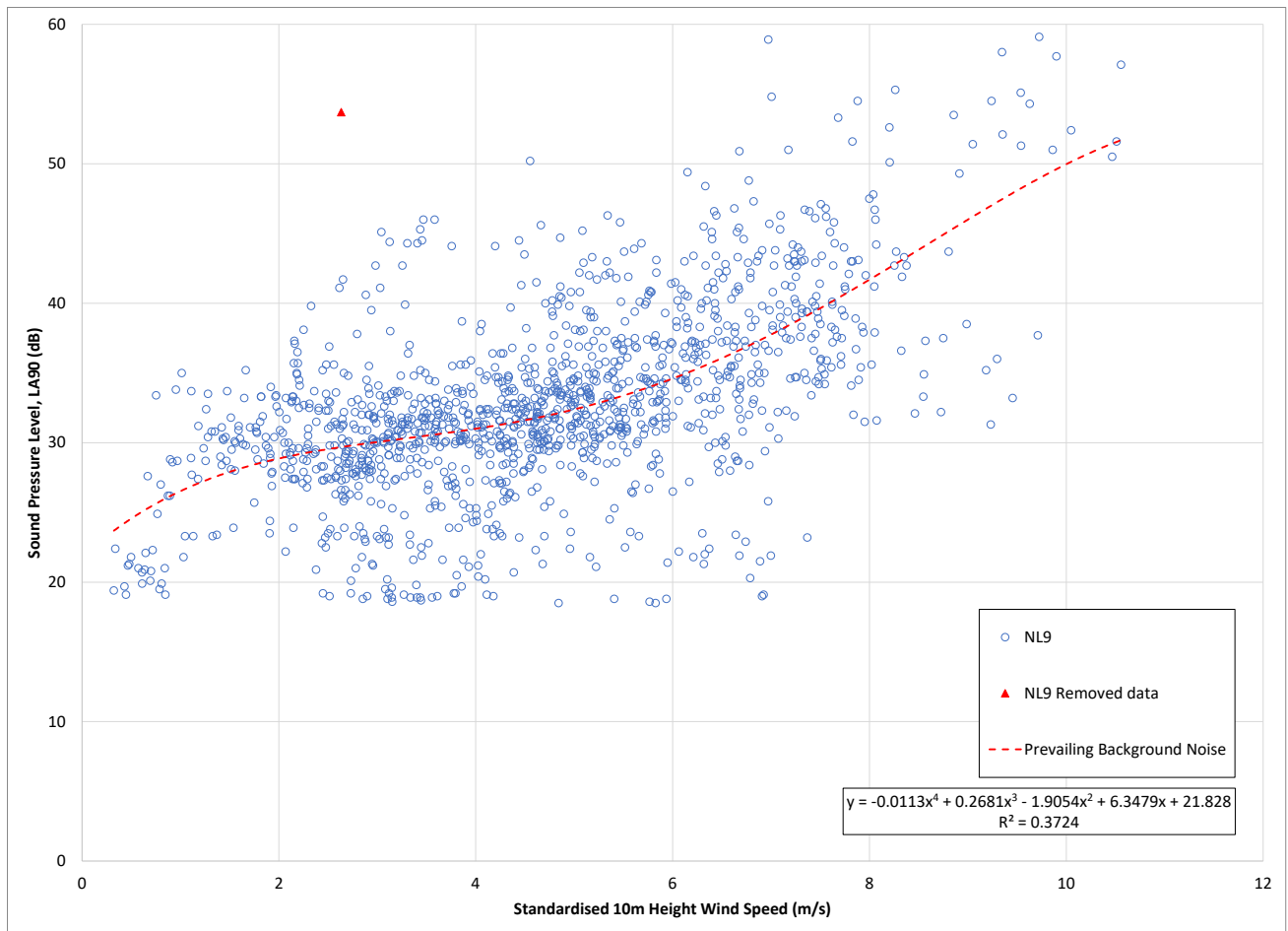


Figure 8.11: Prevailing Daytime Background (L_{A90}) Noise Levels at NL9

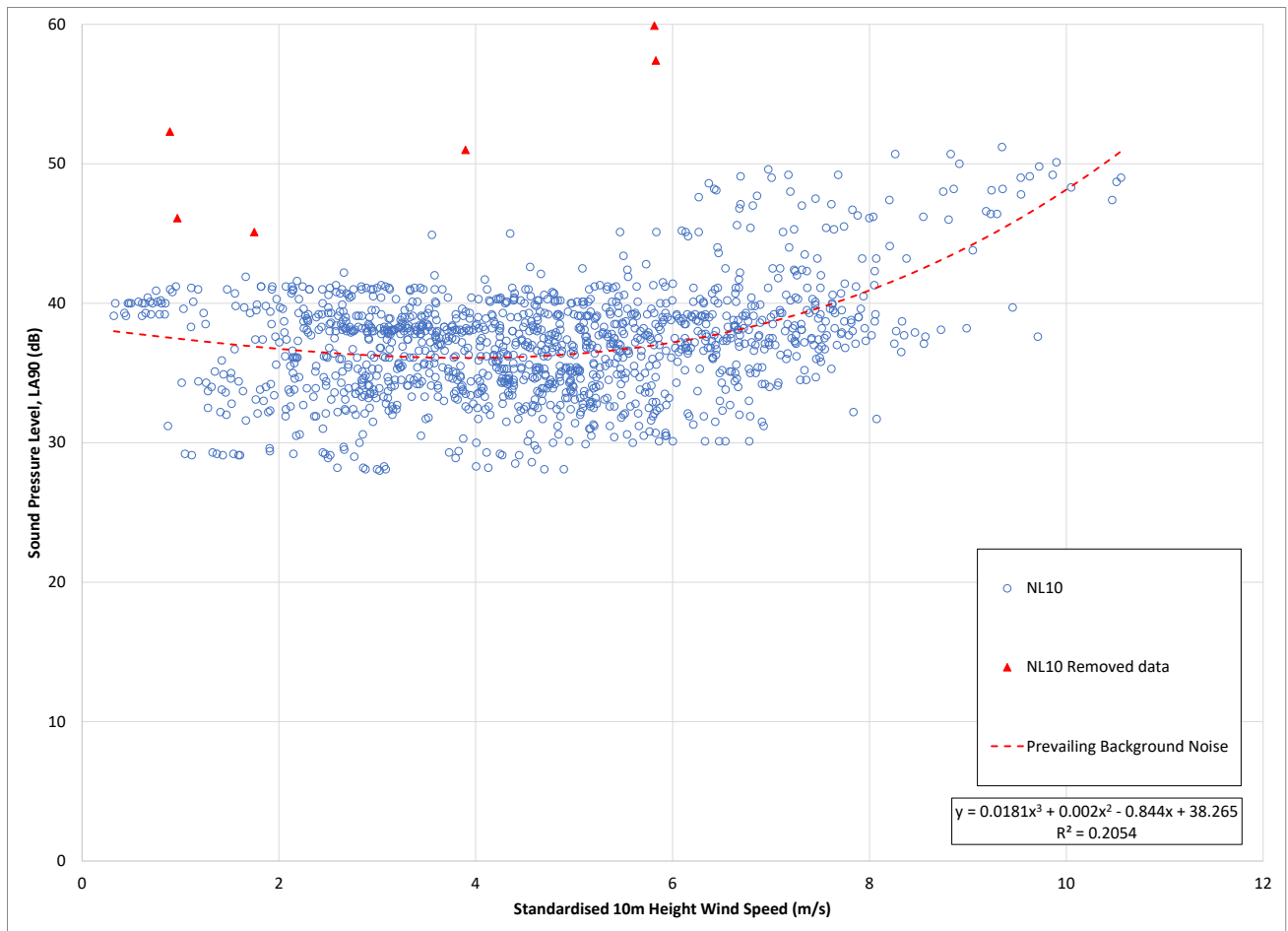


Figure 8.12: Prevailing Daytime Background (L_{A90}) Noise Levels at NL10

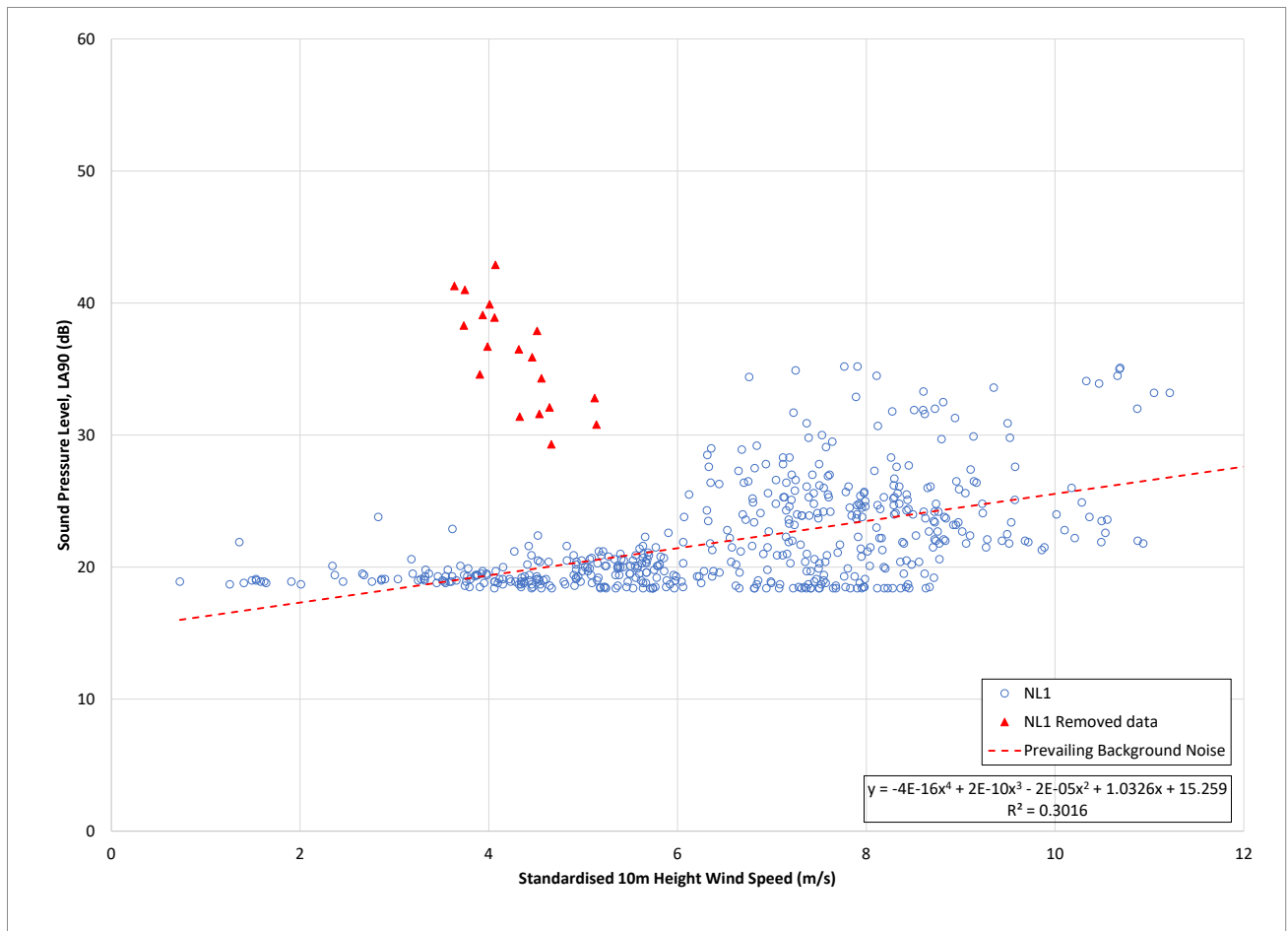


Figure 8.13: Prevailing Night time Background (LA90) Noise Levels at NL1

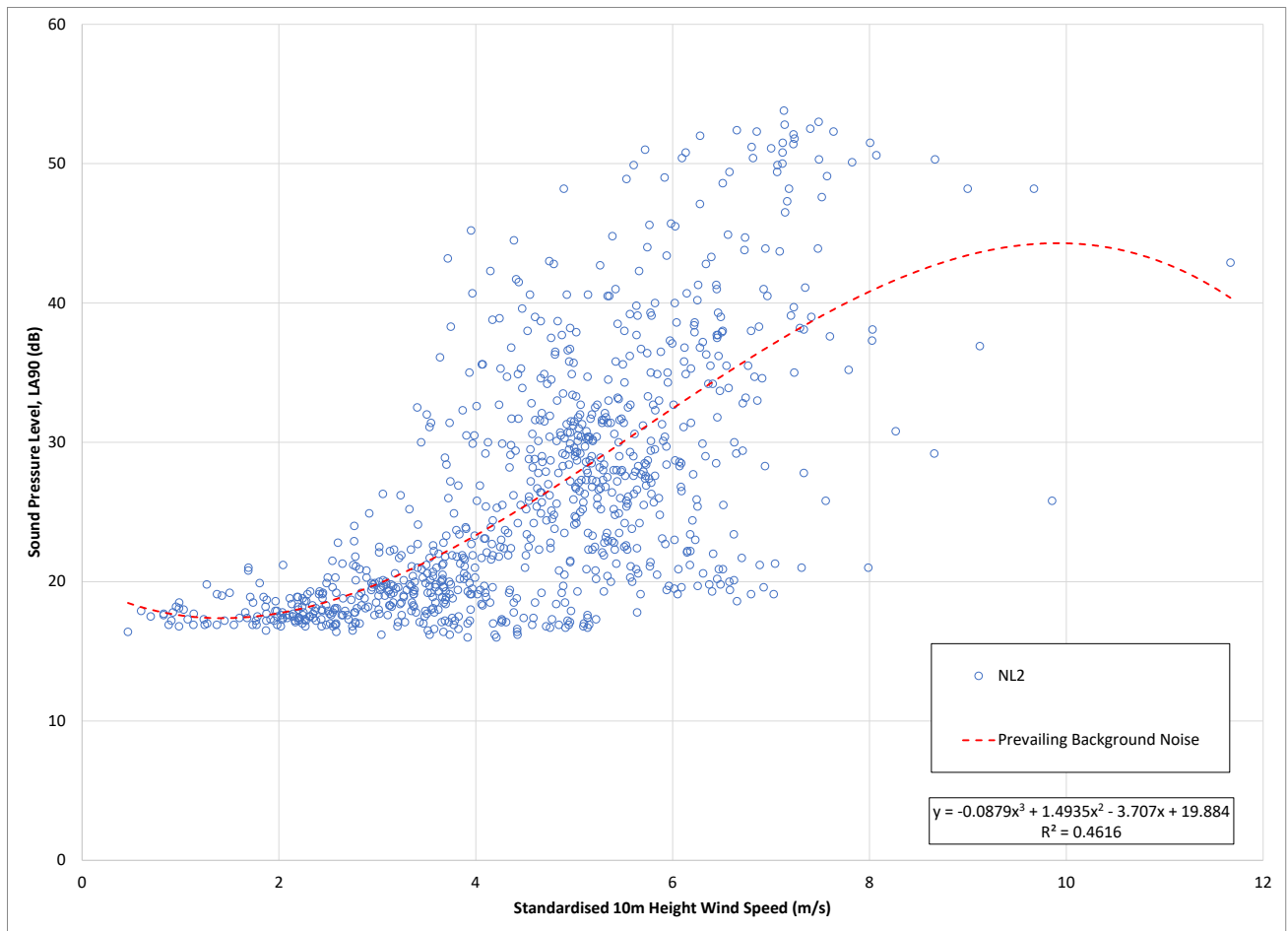


Figure 8.14: Prevailing Night time Background (LA90) Noise Levels at NL2

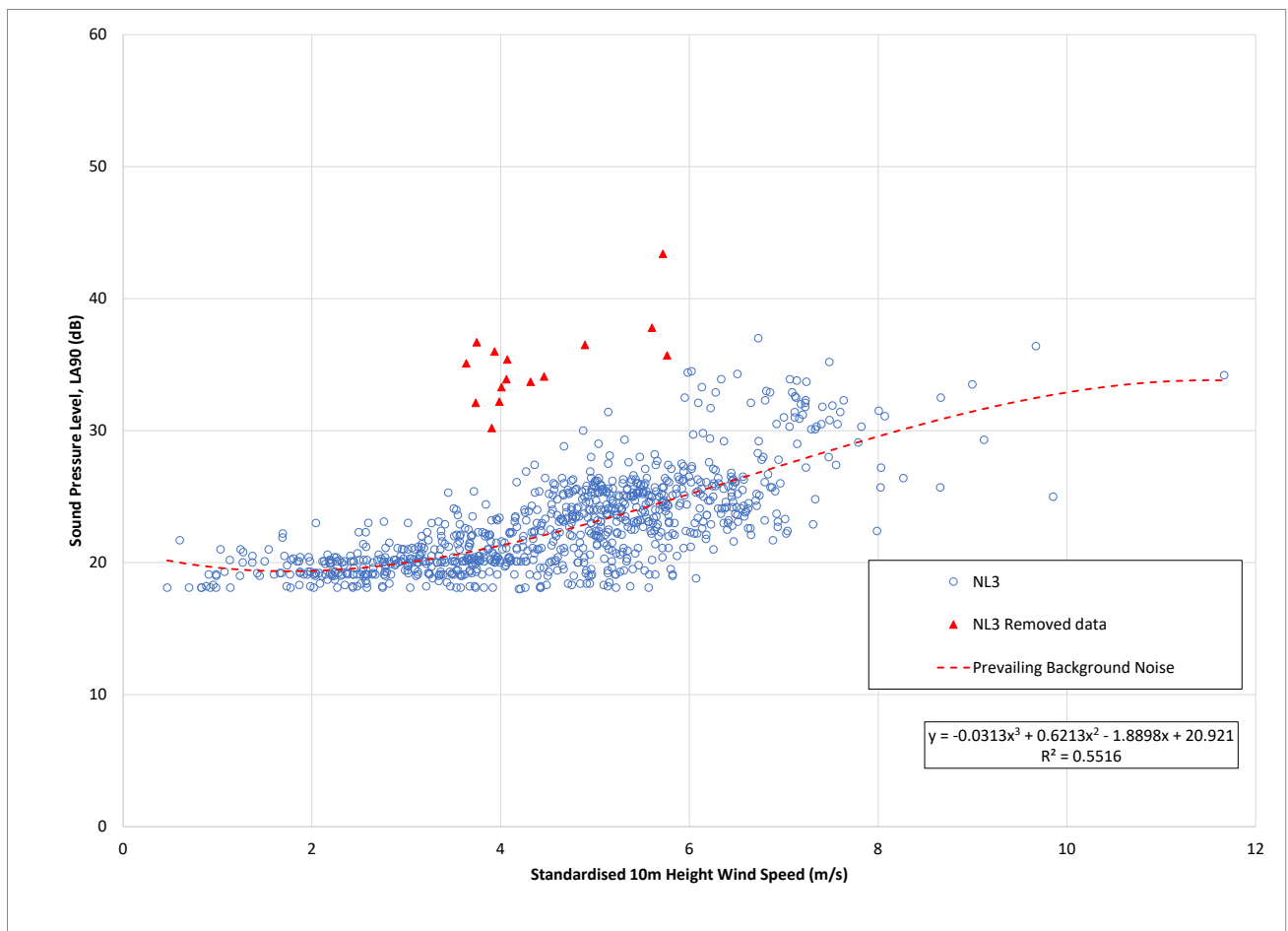


Figure 8.15: Prevailing Night time Background (LA90) Noise Levels at NL3

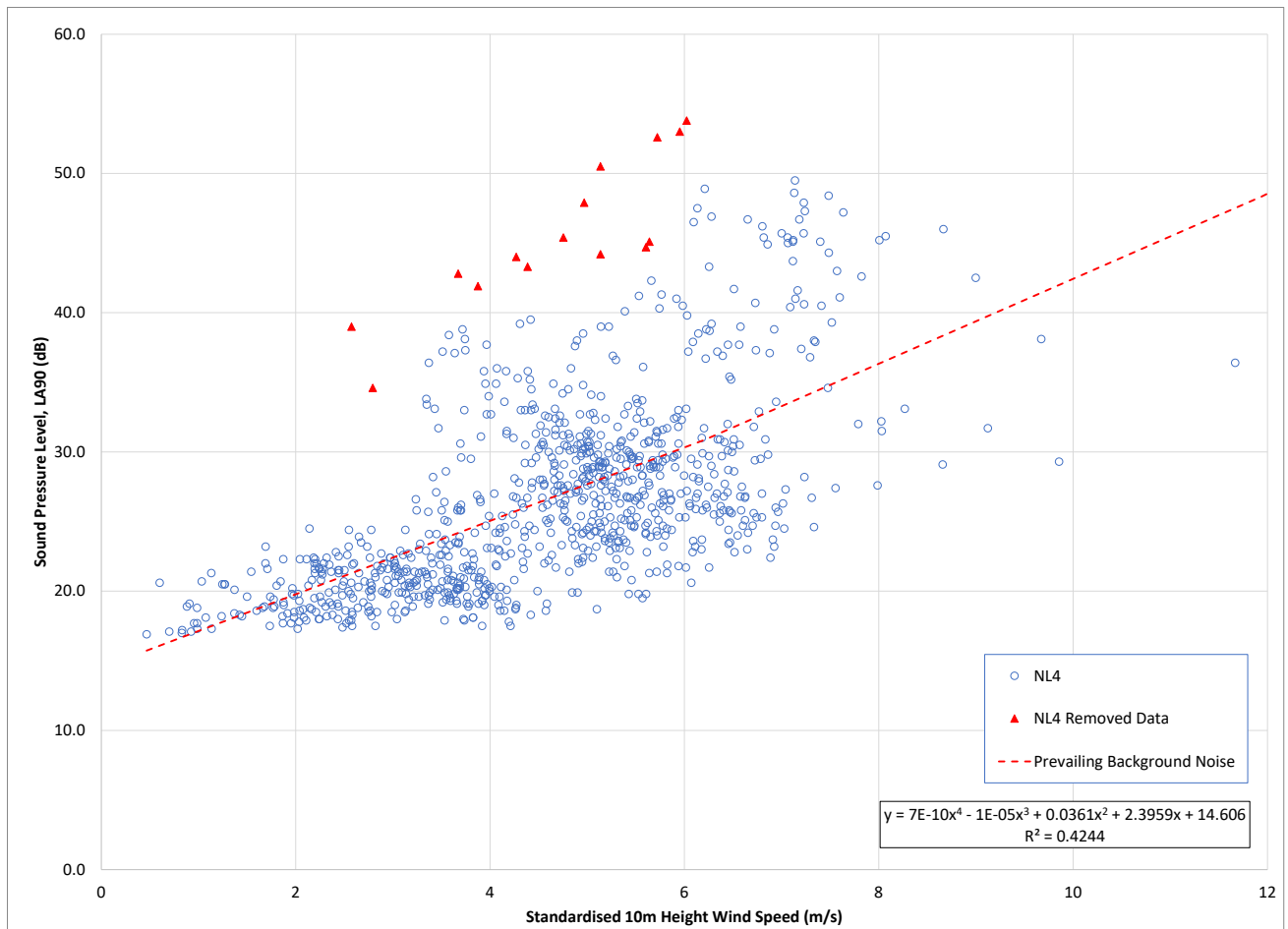


Figure 8.16: Prevailing Night time Background (L_{A90}) Noise Levels at NL4

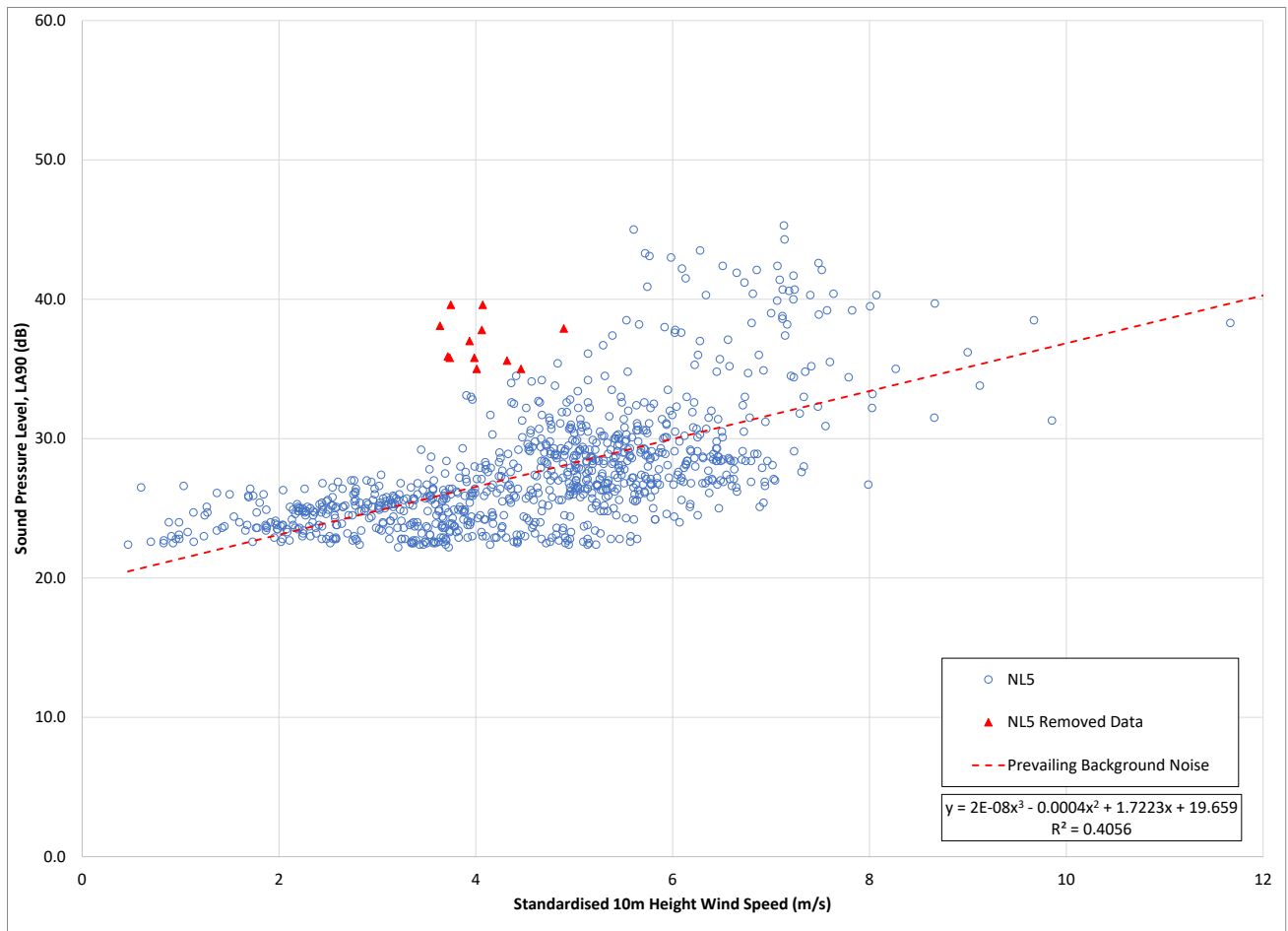


Figure 8.17: Prevailing Night time Background (L_{A90}) Noise Levels at NL5

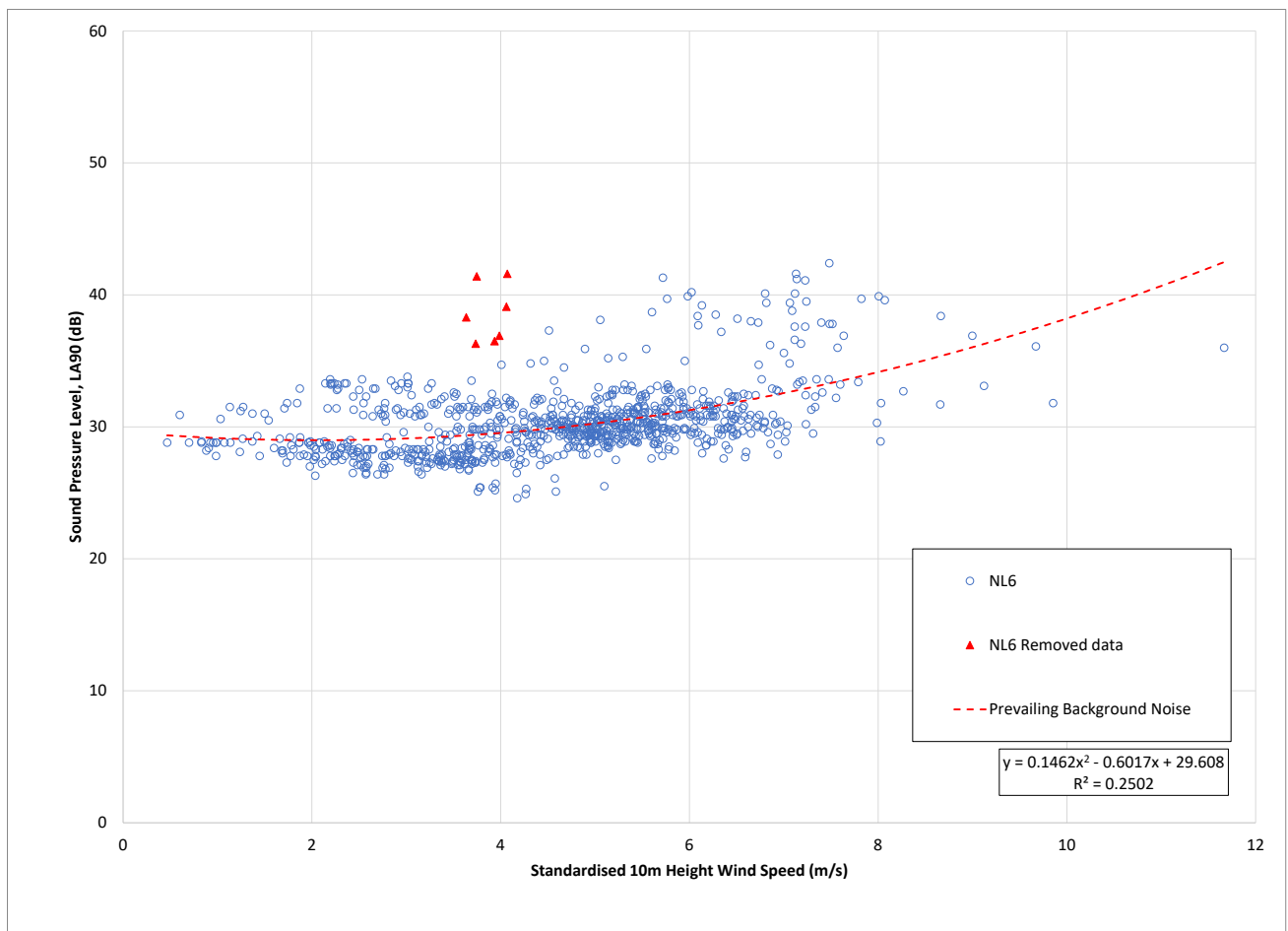


Figure 8.18: Prevailing Night time Background (L_{A90}) Noise Levels at NL6

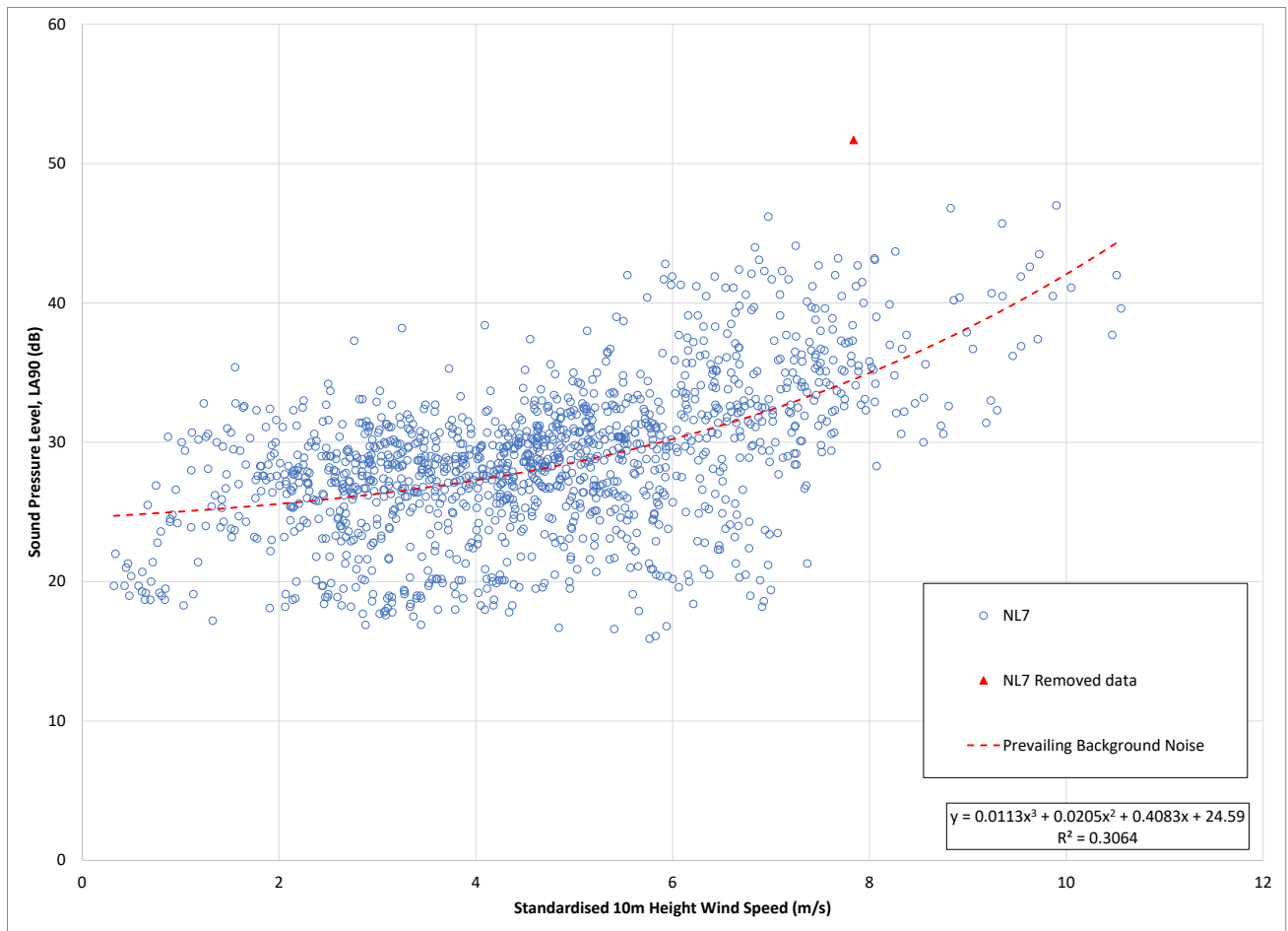


Figure 8.19: Prevailing Night time Background (L_{A90}) Noise Levels at NL7

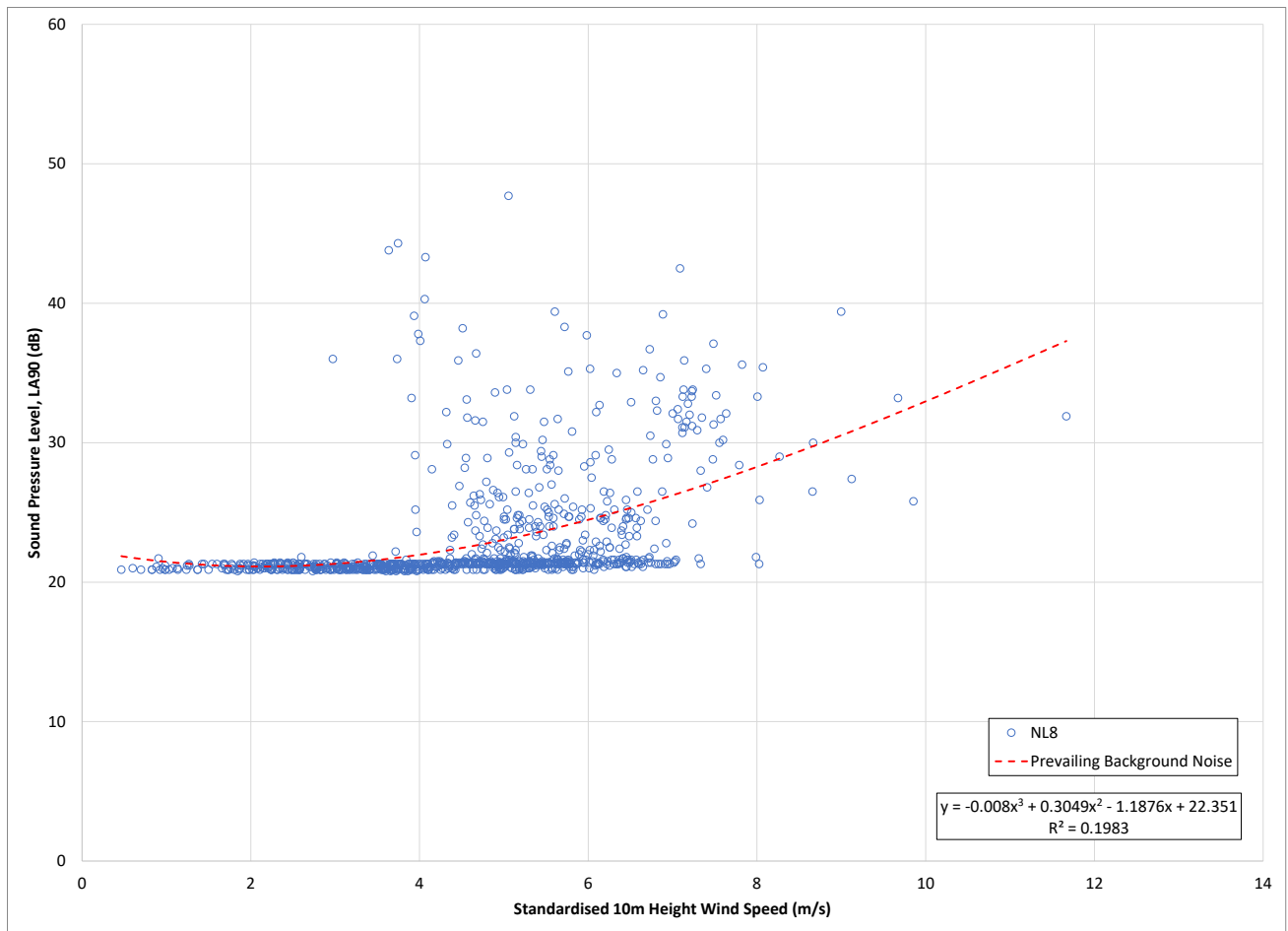


Figure 8.20: Prevailing Night time Background (L_{A90}) Noise Levels at NL8

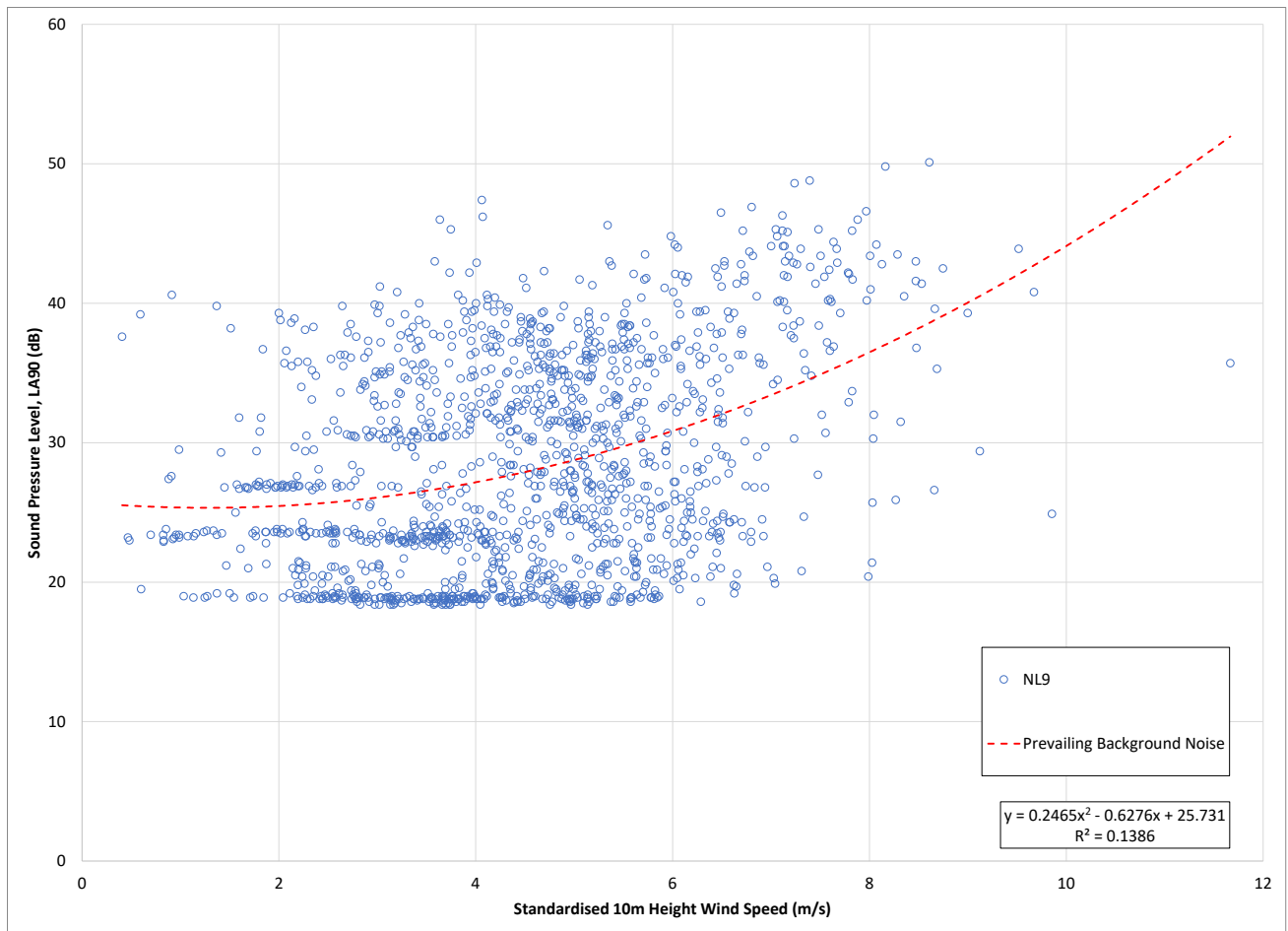


Figure 8.21: Prevailing Night time Background (L_{A90}) Noise Levels at NL9

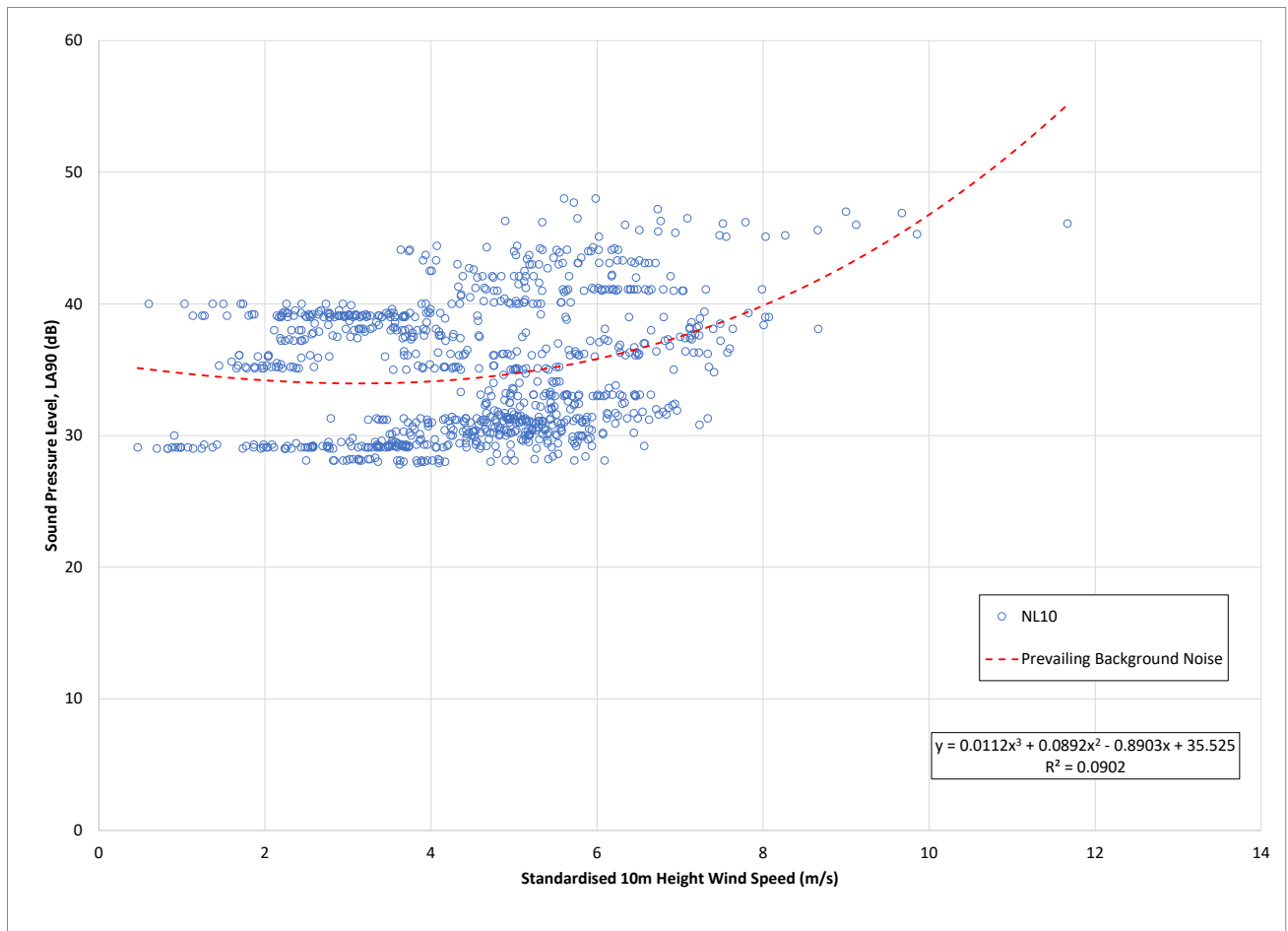


Figure 8.22: Prevailing Night time Background (L_{A90}) Noise Levels at NL10

Table 8-6: Prevailing Background Noise – Daytime Periods

Location		Prevailing Background Noise L _{A90,10min} (dB) at Standardised 10 m Height Wind Speed (m/s)								
	1	2	3	4	5	6	7	8	9	10
NL1	27.2	27.7	28.2	28.6	29.0	29.4	30.0	30.6	31.5	32.5
NL2	27.4	29.6	32.0	34.4	36.9	39.3	41.6	43.8	45.8	47.6
NL3	23.7	24.3	24.7	25.5	26.7	28.7	31.3	34.4	37.6	40.6
NL4	26.3	28.7	30.8	32.9	35.2	37.8	41.0	45.0	49.9	56.0
NL5	29.9	30.3	31.1	32.2	33.6	35.3	37.3	39.5	42.1	44.9
NL6	31.3	31.3	31.5	32.0	32.9	34.2	36.1	38.6	41.8	45.7
NL7	25.0	25.6	26.3	27.3	28.6	30.2	32.3	35.0	38.2	42.0
NL8	25.0	27.0	27.8	28.1	28.8	30.1	32.3	35.2	38.4	41.4
NL9	26.5	28.9	30.0	31.0	32.4	34.6	37.7	41.6	45.9	49.9
NL10	36.7*	36.7	36.2	36.1	36.4	37.2	38.7	40.9	44.0	48.1
§ - noise level restricted to the highest derived point										
* - noise level restricted to lowest derived point										

Table 8-7: Prevailing Background Noise – Nighttime Periods

Location		Prevailing Background Noise $L_{A90,10min}$ (dB) at Standardised 10 m Height Wind Speed (m/s)								
	1	2	3	4	5	6	7	8	9	10
NL1	16.3	17.3	18.4	19.4	20.4	21.5	22.5	22.5§	22.5§	22.5§
NL2	17.6	17.7	19.8	23.3	27.7	32.4	37.0	40.8	40.8§	40.8§
NL3	19.4*	19.4	20.0	21.3	23.1	25.2	27.4	29.5	29.5§	29.5§
NL4	17.0	19.5	22.1	24.8	27.5	30.3	33.1	36.1	36.1§	36.1§
NL5	21.4	23.1	24.8	26.5	28.3	30.0	31.7	33.4	33.4§	33.4§
NL6	29.0*	29.0	29.1	29.5	30.3	31.3	32.6	34.2	34.2§	34.2§
NL7	25.0	25.6	26.3	27.3	28.6	30.2	32.3	35.0	38.2	42.0
NL8	21.1*	21.1	21.3	22.0	23.0	24.5	26.2	28.3	28.3§	28.3§
NL9	25.3	25.5	26.1	27.2	28.7	30.8	33.4	36.4	40.0	40.0§
NL10	34.2*	34.2	34.0	34.1	34.7	35.8	37.5	39.8	39.8§	39.8§

§ - noise level restricted to the highest derived point
 * - noise level restricted to lowest derived point

APPENDIX 8.2

Equipment Calibration Certificates



ISO9001 certified

FACTORY CALIBRATION DATA OF THE SV 307 No. 104990

with microphone SVANTEK type ST30A No. 108889

IMEI: 35500109776701

1. CALIBRATION (acoustical)

LEVEL METER function; Reference frequency: 1000Hz; Sound Pressure Level: 114.03 dB.

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	114.03	114.07	0.04
A	114.03	114.07	0.04
C	114.03	114.07	0.04

Calibration measured with the microphone SVANTEK type ST30A No. 108889. Calibration factor: 0.00 dB.

2. LINEARITY TEST (electrical)

LEVEL METER function; Characteristic: A; f_{ref} = 31.5 Hz

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	85.0
Error [dB]	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	-0.0

LEVEL METER function; Characteristic: A; f_{ref} = 1000 Hz

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	100.0	120.0	125.0
Error [dB]	0.1	0.1	0.1	0.0	0.0	-0.0	0.0	0.0	-0.0	-0.0

LEVEL METER function; Characteristic: A; f_{ref} = 8000 Hz

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	100.0	120.0	124.0
Error [dB]	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	-0.0	-0.0

3. TONE BURST RESPONSE

LEVEL METER function; Characteristic: A; f_{ref} = 4000 Hz; Burst duration: 2s

Steady level nominal result = 122 dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	122.0	121.9	121.0	119.4	117.2	113.7	110.8	107.9	104.0	101.0	97.9	94.9
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	Indication [dB]	119.9	117.9	114.5	111.7	108.8	104.8	101.9	98.9	94.9	-	-	-
		Error [dB]	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	122.0	119.0	115.0	112.0	109.0	105.0	102.0	99.0	95.0	91.9	88.9	85.9
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1

Steady level nominal result = 62 dB

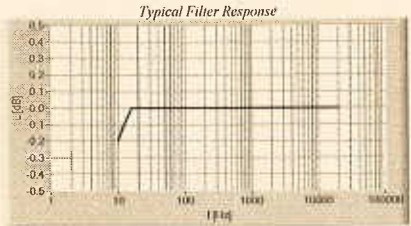
Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2
MAX	Fast	Indication [dB]	62.0	61.8	61.0	59.8	57.2	53.7	50.8	47.9	44.0
		Error [dB]	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0
	Slow	Indication [dB]	59.9	57.9	54.5	51.7	48.8	44.9	41.9	38.9	34.9
		Error [dB]	-0.1	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
SEL	-	Indication [dB]	62.0	59.0	55.0	52.0	49.0	45.0	42.0	39.0	35.0
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0

Steady level nominal result = 40 dB

Result	Detector	Duration [ms]	1000	500	200
MAX	Fast	Indication [dB]	40.0	39.9	39.0
		Error [dB]	0.0	0.0	0.1
	Slow	Indication [dB]	38.0	35.9	33.5
		Error [dB]	-0.0	0.0	-0.1
SEL	-	Indication [dB]	40.0	37.0	33.1
		Error [dB]	0.0	0.0	0.1

4. FREQUENCY RESPONSE (electrical)

LEVEL METER function; Characteristic: Z; Input signal =122 dB;



Measured Filter Response
(f-frequency, L-level)

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
10	-0.1	63	0.0	4000	-0.0
12.5	-0.0	125	-0.0	8000	-0.0
16	0.0	250	0.0	16000	-0.0
20	0.0	500	0.0	20000	-0.0
25	0.0	1000	-0.0		
31.5	0.0	2000	-0.0		

All frequencies are nominal center values for the 1/3 octave bands

5. FREQUENCY RESPONSE (acoustical)

LEVEL METER function; Characteristic: Z; Input: 90 dB;

Frequency [Hz]	20	31.5	63	125	250	500	800	1000	2000
Pressure Response [dB]	0.9	0.7	0.4	0.2	0.2	0.2	0.1	0.0	-0.3
Free Field Response [dB]	0.9	0.7	0.4	0.2	0.2	0.2	0.1	0.0	0.0

Frequency [Hz]	3150	4000	5000	6300	8000	10000	12500	16000
Pressure Response [dB]	-1.4	-2.1	-3.0	-4.3	-5.7	-7.1	-8.8	-11.0
Free Field Response [dB]	-0.1	0.4	0.2	0.1	-0.0	-0.4	-1.4	-3.5

6. INTERNAL NOISE LEVEL (electrical - compensated)

LEVEL METER function; Calibration factor: 0dB

Characteristic	Z	A	C
Level [dB]	≤23	≤15	≤15

7. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Characteristic: A;

Indication [dB]	≤23
-----------------	-----

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421

ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
22 °C	40%	989 hPa

TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1	SVANTEK	SVAN 401	100	Signal generator
2	SVANTEK	SVAN 912A	4369	Sound & Vibration Analyser
3	RIGOL	DM1068	DM30155100773	Digital multimeter
4	SVANTEK	SV33B	93171	Acoustic calibrator
5	G.R.A.S.	51AB	200368	Sound Intensity Calibrator
6	G.R.A.S.	40BP	93396	1/2" Pressure Microphone
7	G.R.A.S.	40AN	73421	1/2" Free Field Microphone
8	SVANTEK	SL307	-	Microphone equivalent electrical impedance (1 kΩF)

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
4. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Cezary Dardziński

Test date: 2021-05-05



MTS Calibration Ltd,
The Grange Business Centre,
Belasis Avenue,
Billingham TS23 1LG,
England
Telephone: 01642 876 410

CERTIFICATE OF CALIBRATION

Page 1 of 11 pages

Issued by: **MTS Calibration Ltd**

Approved Signatory:

Tony Sherris

Date of Issue: 13 January 2023 Certificate Number: 37945

Sound Level Meter

Sound Level Meter Periodic Tests to EN 61672-3: 2013 Class 1

Client: Environmental Measurements
Unit 12, Tallaght Business Centre
Whitestown Business Park
Co.Dublin 24, Ireland

Instrument Make: Larson Davis
Instrument Model: LxT1L
Serial Number: 0006432

Associated Equipment	Make	Model	Serial number
Preamplifier	Larson Davis	PRMLxT1L	070055
Microphone	PCB	377B02	328697
Calibrator	Larson Davis	CAL200	9175
Calibrator supplied by	MTS for this calibration		

The measurements were performed at The Grange Business Centre, Belasis Avenue, TS23 1LD. The results only apply to the items tested.

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 Class 1

Test results summary, detailed results are shown on subsequent pages.

Tests performed	Section	Results of test	Page	Comments
Calibration Certificate	22		1	
Additional information			2	
Indication with Calibrator Supplied	10	No Limit	3	
Self-Generated Noise	11	No Limit	3	
Frequency and Time-weightings at 1kHz	14	Complies	3	
Long term stability	15	Complies	3	
High stability	21	Complies	3	
Acoustic Tests	12	Complies	4	
Frequency Weighting A	13	Complies	5	
Frequency Weighting C	13	Complies	6	
Frequency Weighting Z	13	Complies	7	
Level Linearity	16	Complies	8	
Level Linearity Range Control	17		n/a	SLM only has one range
Tone-burst Response	18	Complies	9	
Peak C sound level	19	Complies	10	
Overload indication	20	Complies	11	

The instrument was within the above specification as received - no modifications were made

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3: 2013 for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2: 2013, to demonstrate that the model of sound level meter fully conformed to the Class 1 specifications in IEC 61672-1: 2013, the sound level meter submitted for testing conforms to the Class 1 specifications of IEC 61672-1: 2013

Additional tests performed

	Reference	
Microphone full frequency response	37947	See additional certificate
Filter calibration, third octave or octave	37945F	See additional certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Issued to:

Fehily Timoney
J5 Plaza
North Park Business Park
North Road
Dublin 11

Calibration Reference

SLM200096

Test Date: 03/06/2020

Procedure: TP-SLM-1

Equipment

Item Calibrated:	Sound Level Meter	Model	977
Make:	Svantek	Serial Number:	69556

Calibration Procedure

The sound level meter was allowed to stabilize for a suitable period, as described in the manufacturer's instruction manual, in laboratory conditions. The sound level meter was calibrated by carrying out the verification tests detailed in IEC 61672-3 (2006), Periodic tests, specification of sound level meters. Tolerances for verification procedures are specified in IEC 61672-1 (2003).

Calibration Standards

Description	Serial Number
National Instruments PXI-4461	19C91D2
Stanford Research DS360	123803

The standards used in this calibration are traceable to NIST and/or other National Measurement Institutes (NMI's) that are signatories of the International Committee of Weights and Measures (CIPM) mutual recognition agreement (MRA).

Signed on behalf of Sonitus Systems:



Self-generated noise - IEC 61672-3 Test #10

SLM Measuring Mode: Leq

SLM Configuration	Freq. Weighting Network	SLM Reading
Microphone Installed	A	21.2
Microphone replaced by electrical input device fitted with short circuit	A	8.7
	C	8.7
	Z	8.7

Acoustical signal test of a frequency weighting - IEC 61672-3 Test #11

Range: reference level range

Frequency Weighting: C

Time Weighting: Slow

Input	Freq	Expected Level	Deviation	Tol +/-
94 dB	1000 Hz	94.0	0.0	1.0
	125 Hz	93.7	0.2	1.0
	4000 Hz	92.3	0.1	1.0

The frequency response was tested using an electrostatic actuator. Appropriate correction factors were applied where available from the manufacturer's instruction manual.

Electrical tests of frequency weighting - IEC 61672-3 Test #12

Range: reference level range

A-weighting

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	95.0	0.0	1.5	-1.5
125	95.0	95.0	0.0	1.5	-1.5
250	95.0	94.9	-0.1	1.4	-1.4
500	95.0	95.0	0.0	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	94.9	-0.1	1.6	-1.6
4000	95.0	95.1	0.1	1.6	-1.6
8000	95.0	95.1	0.1	2.1	-3.1
16000	95.0	94.7	-0.3	3.5	-17.0

C-weighting

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	94.9	-0.1	1.5	-1.5
125	95.0	95.3	0.3	1.5	-1.5
250	95.0	95.0	0.0	1.4	-1.4
500	95.0	95.0	0.0	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	95.1	0.1	1.6	-1.6
4000	95.0	95.1	0.1	1.6	-1.6
8000	95.0	95.1	0.1	2.1	-3.1
16000	95.0	94.7	-0.3	3.5	-17.0

Linear

Freq	Expected Level	SLM Reading	Deviation	Tol +	Tol -
63	95.0	95.0	0.0	1.5	-1.5
125	95.0	95.0	0.0	1.5	-1.5
250	95.0	95.0	0.0	1.4	-1.4
500	95.0	95.0	0.0	1.4	-1.4
1000	95.0	95.0	0.0	1.1	-1.1
2000	95.0	95.0	0.0	1.6	-1.6
4000	95.0	95.0	0.0	1.6	-1.6
8000	95.0	95.0	0.0	2.1	-3.1
16000	95.0	95.0	0.0	3.5	-17.0

Frequency and Time Weightings at 1 kHz IEC 61672-3 Test #13

Range: reference level range

Time Weighting	Freq. Weighting	Expected Level	Deviation	Tol +/-
Fast	A	94.0	ref	
	C	94.0	0.0	0.2
Slow	A	94.0	0.0	0.2
LEQ	A	94.0	0.0	0.2

Linearity level on reference range - IEC 61672-3 Test #14

Input frequency: 8 kHz

SLM Measuring Mode: SPL

Range	Expected Level	SLM Reading	Deviation	Tol +/-
123 dB	94.0	94.0	0.0	1.1
	99.0	99.0	0.0	1.1
	104.0	104.0	0.0	1.1
	109.0	109.0	0.0	1.1
	114.0	114.0	0.0	1.1
	119.0	119.0	0.0	1.1
	124.0	124.0	0.0	1.1
	129.0	129.0	0.0	1.1
	134.0	134.1	0.1	1.1
	135.0	135.1	0.1	1.1
	136.0	136.1	0.1	1.1
	137.0	137.1	0.1	1.1
	89.0	89.0	0.0	1.1
	84.0	84.0	0.0	1.1
	79.0	79.0	0.0	1.1
	74.0	74.0	0.0	1.1
	69.0	69.0	0.0	1.1
	64.0	64.0	0.0	1.1
	59.0	59.0	0.0	1.1
	54.0	54.0	0.0	1.1
	49.0	49.1	0.1	1.1
	44.0	44.1	0.1	1.1
	43.0	43.2	0.2	1.1
	42.0	42.2	0.2	1.1
	41.0	41.2	0.2	1.1
	40.0	40.3	0.3	1.1
	39.0	39.4	0.4	1.1

Toneburst response - IEC 61672-3 Test #16

Range: reference level range

Burst Type	Response	Expected Level	SLM Reading	Deviation	Tol +	Tol -
0.25 ms	LAF _{MAX}	111.0	110.8	-0.2	0.8	-0.8
2.0 ms	LAF _{MAX}	120.0	119.9	-0.1	1.3	-1.3
200 ms	LAF _{MAX}	137.0	137.0	0.0	1.3	-3.3
2.0 ms	LAS _{MAX}	111.0	111.3	0.3	0.8	-0.8
200 ms	LAS _{MAX}	130.6	130.6	0.0	1.3	-3.3

Peak C sound level - IEC 61672-3 Test #17

Range: reference level range

Pulse Type	Freq	Expected Level	SLM Reading	Deviation	Tol +/-
1 cycle	8 kHz	135.4	135.2	-0.2	2.4
Pos ½ cycle	500 Hz	137.4	137.3	-0.1	1.4
Neg ½ cycle	500 Hz	137.4	137.3	-0.1	1.4

Overload indication IEC 61672-3 Test #18

Test Description	Overload at	Meas. Diff. (Pos – Neg)	Tol +/-
Pos. ½ cycle at 4 kHz	140.6		
Neg. ½ cycle at 4 kHz	140.7		
Level difference		-0.1	1.8

Calibration Notes

1. The manufacturer's instruction manual was accessed through the manufacturer's website.
2. The sound level meter was powered by a regulated 9V power supply provided by the testing laboratory.



MTS Calibration Ltd,
The Grange Business Centre,
Belasis Avenue,
Billingham TS23 1LG,
England
Telephone: 01642 876 410

CERTIFICATE OF CALIBRATION

Page 1 of 3 pages

Issued by: **MTS Calibration Ltd**

Approved Signatory:

Date of Issue: 02 February 2022

Certificate Number: 36613F

Tony Sherris

Third Octave Band Filter

Third-Octave Band Filter verification to BS EN 61260:1996

Client: Environmental Measurements
Unit 12, Tallaght Business Centre
Whitestown Business Park
Co.Dublin 24, Ireland

Instrument Make: Larson Davis
Instrument Model: 831
Serial Number: 1612

Clients reference

4

Associated Sound Level Meter

Instrument Make: Larson Davis
Instrument Model: 831
Serial Number: 1612
Calibrated by: MTS Calibration
Certificate Number: 36613
Date: of SLM calibration 02 February 2022
Date: of receipt 27 January 2022

Associated Preamplifier

Instrument Make: Larson Davis
Instrument Model: PRM831
Serial Number: 71259

The measurements were performed at The Grange Business Centre, Belasis Avenue, TS23 1LD. The results only apply to the item(s) tested.

Third-Octave Band Filter

Compliance with BS EN 61260: 1996 Class 1

Test results summary. Detailed results are shown on subsequent pages.

Comments

- Tabular Data See Page 2
- Graphic Data for 125Hz filter **Complies** See Page 3
- Graphic Data for 1kHz filter **Complies** See Page 3
- Graphic Data for 8kHz filter **Complies** See Page 3

Because each digital filter will have the same amplitude characteristic relative to its centre frequency, only three filters were measured at each of the test frequencies specified by BS EN 61260:1996 for exact base 10 distribution. The measurements made were relative to the attenuation of the 1kHz filter at 1kHz input frequency and input level 20 V. Because the measurements include a linearity contribution from the sound level meter, and could be variable with frequency, the assessment is valid only for this pairing. The sound level meter was set for "Linear" frequency response on the lowest range setting which did not give overload at any test frequency or test level. Its compliance with the standard was assessed by referring the measurements to the tolerances specified.

Agreed and reported Decision Rule:

"Complies" indicates that the instrument conforms with the relevant accuracy requirements of the testing standard AND the expanded measurement uncertainty ($k = 2$ for approximately 95 % coverage probability) is no greater in magnitude than the accuracy requirements defined in BS EN 61260:1996.

Comments

The sound level meter and preamplifier were calibrated as a unit.
The input level used is selected to produce a sound level at 1kHz that is close to but not exceeding the maximum level on the reference range.
The centre frequency sequence of this filter set follows the exact base 10 midband frequency sequence of IEC 61260 and the measurements have been made accordingly.

Measurement Conditions:

Temperature	22.2	°C	± 1 °C
Atmospheric Pressure	32.0	mBar	± 2 mBar
Relative Humidity	1015.9	%	± 5 %

Uncertainties of measurements:

Within Passband (0.89 to 1.12 of centre frequency)	0.42	dB
Outside Passband	2.40	dB

Test Equipment:

Equipment	Manufacturer	Model	Serial No.	Traceability Ref.	Cal. Due
Signal Generator (set 3)	HP	33120A	US34007158	TE 163	Sep-22

This certificate is issued in accordance with the laboratories work procedures.

It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

FACTORY CALIBRATION DATA OF THE SV 307A No. 119092

with microphone SVANTEK type ST30A No. 125153

IMEI: 352818664350609

1. CALIBRATION (acoustical)

LEVEL METER function; Reference frequency: 1000Hz; Sound Pressure Level: 113.99 dB.

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	113.99	114.03	0.04
A	113.99	114.03	0.04
C	113.99	114.03	0.04

Calibration measured with the microphone SVANTEK type ST30A No. 125153. Calibration factor: 0.00 dB.

2. LINEARITY TEST (electrical)

LEVEL METER function; Characteristic: A; $f_{\text{sin}} = 31.5$ Hz

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	85.0
Error [dB]	-0.0	-0.0	-0.0	-0.0	0.0	0.0	-0.0	0.0

LEVEL METER function; Characteristic: A; $f_{\text{sin}} = 1000$ Hz

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	100.0	120.0	125.0
Error [dB]	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	0.0	-0.0	0.0

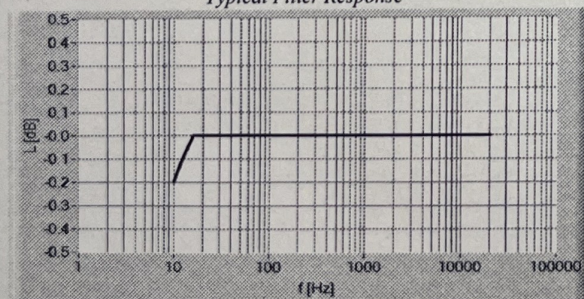
LEVEL METER function; Characteristic: A; $f_{\text{sin}} = 8000$ Hz

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	100.0	120.0	124.0
Error [dB]	-0.1	-0.1	-0.1	-0.1	-0.0	-0.0	-0.0	0.0	-0.0	-0.0

3. FREQUENCY RESPONSE (electrical)

LEVEL METER function; Characteristic: Z; Input signal = 122 dB;

Typical Filter Response



*Measured Filter Response
(f-frequency, L-level)*

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
10	-0.1	63	-0.0	4000	-0.0
12.5	-0.0	125	-0.0	8000	-0.0
16	0.0	250	0.0	16000	0.0
20	0.0	500	0.0	20000	0.0
25	0.0	1000	-0.0		
31.5	0.0	2000	-0.0		

All frequencies are nominal center values for the 1/3 octave bands

4. FREQUENCY RESPONSE (acoustical)

LEVEL METER function; Characteristic: Z; Input: 90 dB;

Frequency [Hz]	20	31.5	63	125	250	500	800	1000	2000
Pressure Response [dB]	0.6	0.5	0.3	0.2	0.2	0.2	0.1	0.0	-0.4
Free Field Response [dB]	0.6	0.5	0.3	0.2	0.1	0.0	-0.0	0.0	0.1

Frequency [Hz]	3150	4000	5000	6300	8000	10000	12500	16000
Pressure Response [dB]	-1.2	-1.8	-2.7	-3.8	-5.1	-6.4	-7.7	-9.7
Free Field Response [dB]	0.2	0.6	0.6	0.6	0.6	0.3	-0.4	-2.1

5. INTERNAL NOISE LEVEL (electrical - compensated)

LEVEL METER function; Calibration factor: 0dB

Characteristic	Z	A	C
Level [dB]	≤23	≤15	≤15

6. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Characteristic: A;

Indication [dB]	≤23
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Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421

ENVIRONMENTAL CONDITIONS

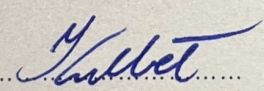
Temperature	Relative humidity	Ambient pressure
25 °C	46%	1000 hPa

TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	84	Signal generator
2.	SVANTEK	SVAN 912A	15900	Sound & Vibration Analyser
3.	RIGOL	DM3068	DM30155100773	Digital multimeter
4.	SVANTEK	SV30A	24563	Acoustic calibrator
5.	G.R.A.S.	51AB	200368	Sound Intensity Calibrator
6.	G.R.A.S.	40BP	93296	¼" Pressure Microphone
7.	G.R.A.S.	40AN	73421	½" Free Field Microphone
8.	SVANTEK	SL307	-	Microphone equivalent electrical impedance (18pF)

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
4. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Krzysztof Kubel ... 

Test date: 2022-07-01

FACTORY CALIBRATION DATA OF THE SV 307A No. 119173

with microphone SVANTEK type ST30A_v2 No. 132625

IMEI: 352818660678516

1. CALIBRATION (acoustical)

LEVEL METER function; Reference frequency: 1000Hz; Sound Pressure Level: 114.07 dB.

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	114.07	114.07	0.00
A	114.07	114.07	0.00
C	114.07	114.07	0.00

Calibration measured with the microphone SVANTEK type ST30A_v2 No. 132625. Calibration factor: 0.00 dB.

2. LINEARITY TEST (electrical)

LEVEL METER function; Characteristic: A; $f_{\text{sin}} = 31.5$ Hz

Nominal result LEQ [dB]	30.0	31.0	35.0	40.0	60.0	80.0	85.0
Error [dB]	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0

LEVEL METER function; Characteristic: A; $f_{\text{sin}} = 1000$ Hz

Nominal result LEQ [dB]	30.0	31.0	35.0	40.0	60.0	80.0	100.0	120.0	125.0
Error [dB]	0.1	0.1	0.0	0.0	0.0	-0.0	-0.0	0.0	0.0

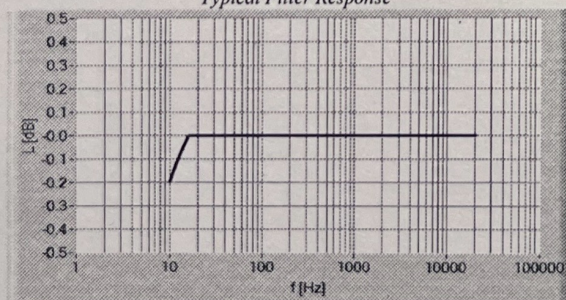
LEVEL METER function; Characteristic: A; $f_{\text{sin}} = 8000$ Hz

Nominal result LEQ [dB]	30.0	31.0	35.0	40.0	60.0	80.0	100.0	120.0	124.0
Error [dB]	-0.1	-0.2	-0.1	-0.1	-0.0	-0.0	-0.0	0.0	0.0

3. FREQUENCY RESPONSE (electrical)

LEVEL METER function; Characteristic: Z; Input signal = 122 dB;

Typical Filter Response



*Measured Filter Response
(f-frequency, L-level)*

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
10	-3.2	63	-0.1	4000	0.0
12.5	-2.4	125	-0.0	8000	0.0
16	-1.7	250	-0.0	16000	0.0
20	-1.2	500	0.0	20000	-0.0
25	-0.8	1000	0.0		
31.5	-0.5	2000	0.0		

All frequencies are nominal center values for the 1/3 octave bands

4. FREQUENCY RESPONSE (acoustical)

LEVEL METER function; Characteristic: Z; Input: 90 dB;

Frequency [Hz]	20	31.5	63	125	250	500	800	1000	2000
Pressure Response [dB]	0.1	0.0	0.0	0.1	0.0	-0.0	-0.1	-0.2	-0.7
Free Field Response [dB]	0.1	0.0	0.0	0.1	0.0	-0.0	-0.1	-0.0	-0.0

Frequency [Hz]	3150	4000	5000	6300	8000	10000	12500	16000
Pressure Response [dB]	-1.7	-2.3	-3.3	-4.3	-5.9	-7.3	-9.0	-11.7
Free Field Response [dB]	-0.1	-0.0	-0.0	0.1	-0.3	-0.6	-1.4	-3.4

5. INTERNAL NOISE LEVEL (electrical - compensated)

LEVEL METER function; Calibration factor: 0dB

Characteristic	Z	A	C
Level [dB]	≤32	≤19	≤24

6. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Characteristic: A;

Indication [dB]	≤23
-----------------	-----

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421

ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
21 °C	48%	1008 hPa

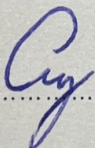
TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	100	Signal generator
2.	SVANTEK	SVAN 912A	4369	Sound & Vibration Analyser
3.	RIGOL	DM3068	DM30155100773	Digital multimeter
4.	SVANTEK	SV33B	93171	Acoustic calibrator
5.	G.R.A.S.	51AB	200368	Sound Intensity Calibrator
6.	G.R.A.S.	40BP	93296	1/4" Pressure Microphone
7.	G.R.A.S.	40AN	73421	1/2" Free Field Microphone
8.	SVANTEK	SL3071	-	Microphone equivalent electrical impedance (18pF)

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
4. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Cezary Dardziński



Test date: 2022-10-31



MTS Calibration Ltd,
The Grange Business Centre,
Belasis Avenue,
Billingham TS23 1LG,
England
Telephone: 01642 876 410

CERTIFICATE OF CALIBRATION

Page 1 of 11 pages

Issued by: **MTS Calibration Ltd**

Approved Signatory:

Tony Sherris

Date of Issue: 05 July 2021

Certificate Number: 36033

Sound Level Meter

Sound Level Meter Periodic Tests to EN 61672-3: 2013 Class 1

Client: Environmental Measurements
Unit 12, Tallaght Business Centre
Whitestown Business Park
Co.Dublin 24, Ireland

Instrument Make: Larson Davis
Instrument Model: LxT1L
Serial Number: 0005610

Associated Equipment	Make	Model	Serial number
Preamplifier	Larson Davis	PRELxT1L	055688
Microphone	PCB	377B02	306473
Calibrator	Larson Davis	CAL200	9175
Calibrator supplied by	MTS for this calibration		

Test results summary, detailed results are shown on subsequent pages.

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 Class 1

Tests performed	Section	Results of test	Page	Comments
Calibration Certificate	22		1	
Additional information			2	
Indication with Calibrator Supplied	10	No Limit	3	
Self-Generated Noise	11	No Limit	3	
Frequency and Time-weightings at 1kHz	14	Complies	3	
Long term stability	15	Complies	3	
High stability	21	Complies	3	
Acoustic Tests	12	Complies	4	
Frequency Weighting A	13	Complies	5	
Frequency Weighting C	13	Complies	6	
Frequency Weighting Z	13	Complies	7	
Level Linearity	16	Complies	8	
Level Linearity Range Control	17		n/a	SLM only has one range
Tone-burst Response	18	Complies	9	
Peak C sound level	19	Complies	10	
Overload indication	20	Complies	11	

The instrument was within the above specification as received - no modifications were made

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3: 2013 for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2: 2013, to demonstrate that the model of sound level meter fully conformed to the Class 1 specifications in IEC 61672-1: 2013, the sound level meter submitted for testing conforms to the Class 1 specifications of IEC 61672-1: 2013

Additional tests performed

Microphone full frequency response
Filter calibration, third octave or octave

Reference
36035
36033F

See additional certificate
See additional certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



ISO9001 certified

FACTORY CALIBRATION DATA OF THE SV 307 No. 104985

with microphone SVANTEK type ST30A No. 108881

IMEI: 355001092063493

1. CALIBRATION (acoustical)

LEVEL METER function: Reference frequency: 1000Hz; Sound Pressure Level: 114.03 dB.

Characteristic	Correct value [dB]	Indication [dB]	Error [dB]
Z	114.03	114.09	0.06
A	114.03	114.09	0.06
C	114.03	114.09	0.06

Calibration measured with the microphone SVANTEK type ST30A No. 108881. Calibration factor: 0.00 dB.

2. LINEARITY TEST (electrical)

LEVEL METER function: Characteristic: A; f_{ref} = 31.5 Hz.

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	85.0
Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

LEVEL METER function: Characteristic: A; f_{ref} = 1000 Hz.

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	100.0	120.0	125.0
Error [dB]	0.1	0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0

LEVEL METER function: Characteristic: A; f_{ref} = 8000 Hz.

Nominal result LEQ [dB]	29.0	30.0	31.0	35.0	40.0	60.0	80.0	100.0	120.0	124.0
Error [dB]	-0.0	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0

3. TONE BURST RESPONSE

LEVEL METER function: Characteristic: A; f_{ref} = 4000 Hz; Burst duration: 2s

Steady level nominal result = 122 dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	122.0	121.9	121.0	119.4	117.2	113.7	110.8	107.9	100.0	100.9	97.9	94.9
		Error [dB]	-0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	Indication [dB]	119.9	117.9	114.5	111.7	108.8	104.8	101.9	98.8	94.9	-	-	-
		Error [dB]	-0.3	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	122.0	119.0	115.0	112.0	109.0	105.0	102.0	99.0	95.0	91.9	88.0	85.8
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1

Steady level nominal result = 62 dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2
MAX	Fast	Indication [dB]	62.0	61.9	61.0	59.4	57.2	53.7	50.8	47.9	44.9
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0
	Slow	Indication [dB]	59.9	57.9	54.5	51.7	48.8	44.9	41.9	38.8	34.9
		Error [dB]	-0.1	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
SEL	-	Indication [dB]	62.0	59.0	55.0	52.0	49.0	45.0	42.0	39.0	35.0
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	0.0

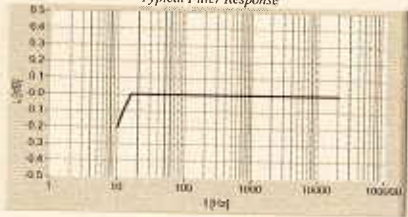
Steady level nominal result = 40 dB

Result	Detector	Duration [ms]	1000	500	200
MAX	Fast	Indication [dB]	40.0	39.0	39.0
		Error [dB]	0.0	0.0	0.0
	Slow	Indication [dB]	37.9	35.9	32.6
		Error [dB]	-0.1	0.0	0.0
SEL	-	Indication [dB]	40.0	37.0	33.1
		Error [dB]	0.0	0.0	0.1

4. FREQUENCY RESPONSE (electrical)

LEVEL METER function; Characteristic: Z; Input signal =122 dB;

Typical Filter Response



Measured Filter Response
(f-frequency; L-level)

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
10	-0.1	63	-0.0	4000	-0.0
12.5	-0.0	125	-0.0	8000	-0.0
16	0.0	250	-0.0	16000	-0.0
20	0.0	500	-0.0	20000	-0.0
25	0.0	1000	-0.0		
31.5	0.0	2000	-0.0		

All frequencies are nominal center values for the 1/3 octave bands

5. FREQUENCY RESPONSE (acoustical)

LEVEL METER function; Characteristic: Z; Input: 90 dB;

Frequency [Hz]	20	31.5	63	125	250	500	1000	2000
Pressure Response [dB]	-0.8	-0.6	-0.3	-0.2	-0.2	-0.2	-0.1	-0.5
Free Field Response [dB]	-0.8	-0.6	-0.3	-0.2	-0.2	-0.2	-0.1	-0.5

Frequency [Hz]	3150	4000	5000	6300	8000	10000	12500	16000
Pressure Response [dB]	-1.4	-2.1	-3.0	-4.3	-5.8	-7.2	-9.1	-11.1
Free Field Response [dB]	-0.1	0.4	0.2	0.0	-0.1	-0.3	-1.7	-4.0

6. INTERNAL NOISE LEVEL (electrical - compensated)

LEVEL METER function; Calibration factor: 0dB

Characteristic	Z	A	C
Level [dB]	≤23	≤15	≤15

7. INTERNAL NOISE LEVEL (acoustical - compensated)

LEVEL METER function; Characteristic: A;

Indication [dB]	≤23
-----------------	-----

Noise measured in special chamber, with reference microphone G.R.A.S type 40AN No. 73421

ENVIRONMENTAL CONDITIONS

Temperature	Relative humidity	Ambient pressure
21 °C	36%	989 hPa

TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	100	Signal generator
2.	SVANTEK	SVAN 912A	4369	Sound & Vibration Analyser
3.	RIGOL	DM3068	DM30155100773	Digital multimeter
4.	SVANTEK	SV33B	93171	Acoustic calibrator
5.	G.R.A.S.	51AB	200368	Sound Intensity Calibrator
6.	G.R.A.S.	40BP	93296	1/4" Pressure Microphone
7.	G.R.A.S.	40AN	73421	1/2" Free Field Microphone
8.	SVANTEK	SL307	-	Microphone equivalent electrical impedance (10pF)

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
4. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: Cezary Dardziński

Test date: 2021-05-05

Calibration Certificate

Certificate Number 2021012148

Customer:

Environmental Measurement
Unit 12 Tallaght Business Centre
Whitestown Business Park
Dublin, 24, Ireland

Model Number LxT SE
Serial Number 0006600
Test Results **Pass**
Initial Condition As Manufactured
Description Sound Expert LxT
Class 1 Sound Level Meter
Firmware Revision: 2.404

Procedure Number D0001.8378
Technician Ron Harris
Calibration Date 28 Sep 2021
Calibration Due
Temperature 23.76 °C ± 0.25 °C
Humidity 50.2 %RH ± 2.0 %RH
Static Pressure 85.46 kPa ± 0.13 kPa

Evaluation Method Tested electrically using Larson Davis PRMLxT1L S/N 070099 and a 12.0 pF capacitor to simulate microphone capacitance. Data reported in dB re 20 µPa assuming a microphone sensitivity of 23.6 mV/Pa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8384:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1
IEC 61260:2001 Class 1	ANSI S1.11 (R2009) Class 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

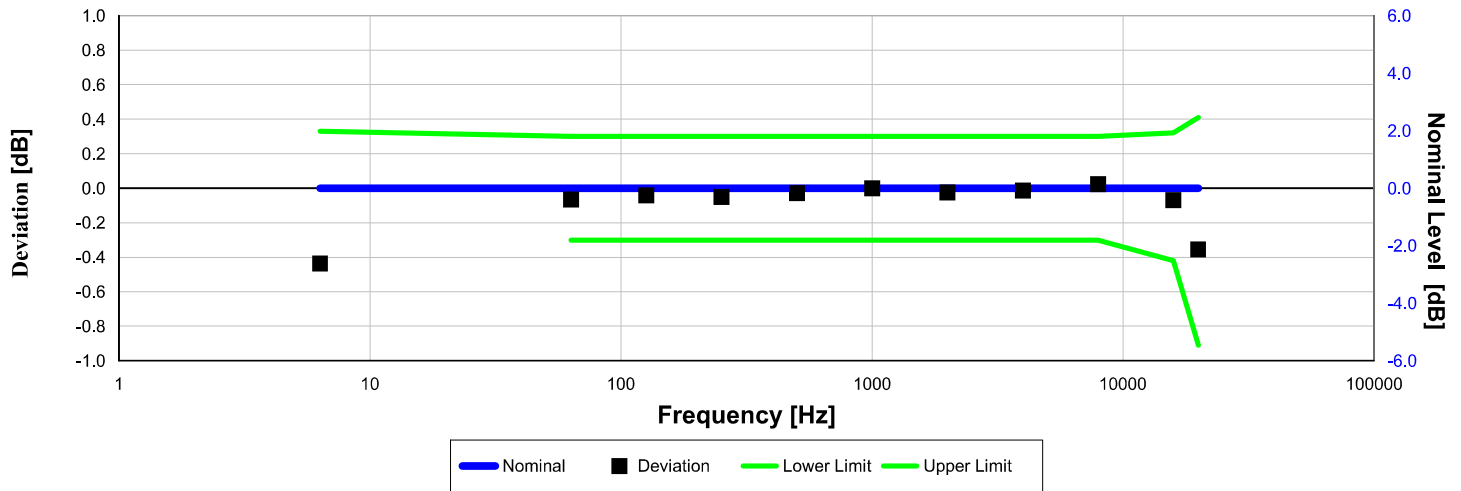
This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the organization issuing this report.

Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev O Supporting Firmware Version 4.0.5, 2019-09-10

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa

Description	Standards Used		
	Cal Date	Cal Due	Cal Standard
Hart Scientific 2626-H Temperature Probe	2021-02-04	2022-08-04	006767
SRS DS360 Ultra Low Distortion Generator	2021-01-05	2022-01-05	007118

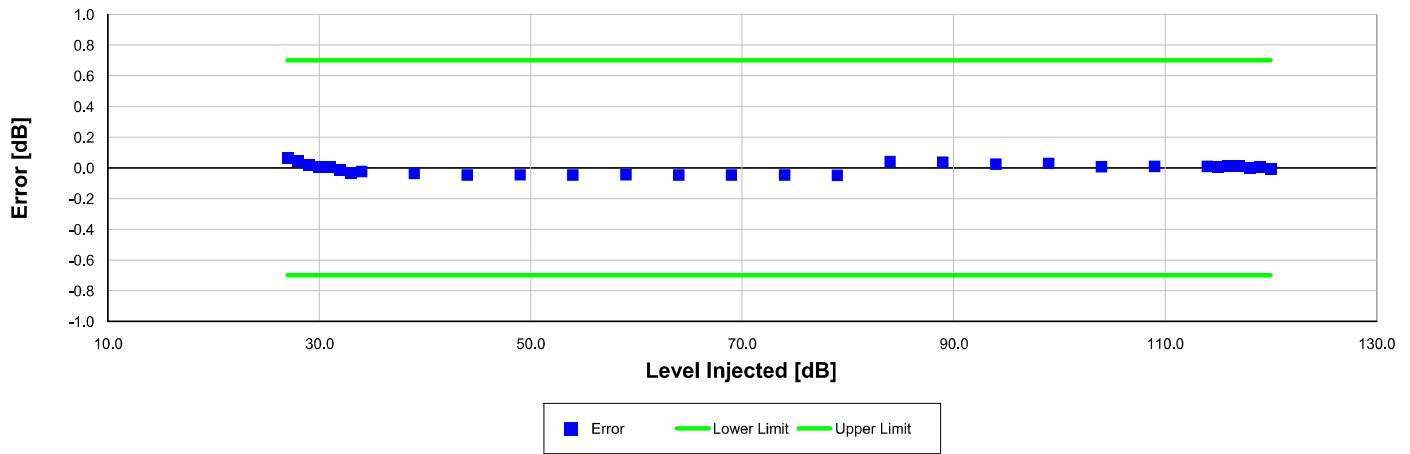
Z-weight Filter Response



Electrical signal test of frequency weighting performed according to IEC 61672-3:2013 13 and ANSI S1.4-2014 Part 3: 13 for compliance to IEC 61672-1:2013 5.5; IEC 60651:2001 6.1 and 9.2.2; IEC 60804:2000 5; ANSI S1.4:1983 (R2006) 5.1 and 8.2.1; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Deviation [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
6.31	-0.44	-0.44	-1.11	0.33	0.15	Pass
63.10	-0.07	-0.06	-0.30	0.30	0.15	Pass
125.89	-0.04	-0.04	-0.30	0.30	0.15	Pass
251.19	-0.05	-0.05	-0.30	0.30	0.15	Pass
501.19	-0.03	-0.03	-0.30	0.30	0.15	Pass
1,000.00	0.00	0.00	-0.30	0.30	0.15	Pass
1,995.26	-0.03	-0.02	-0.30	0.30	0.15	Pass
3,981.07	-0.01	-0.01	-0.30	0.30	0.15	Pass
7,943.28	0.02	0.02	-0.30	0.30	0.15	Pass
15,848.93	-0.07	-0.07	-0.42	0.32	0.15	Pass
19,952.62	-0.36	-0.35	-0.91	0.41	0.15	Pass
-- End of measurement results--						

A-weighted Broadband Log Linearity: 8,000.00 Hz



Broadband level linearity performed according to IEC 61672-3:2013 16 and ANSI S1.4-2014 Part 3: 16 for compliance to IEC 61672-1:2013 5.6, IEC 60804:2000 6.2, IEC 61252:2002 8, ANSI S1.4 (R2006) 6.9, ANSI S1.4-2014 Part 1: 5.6, ANSI S1.43 (R2007) 6.2

Level [dB]	Error [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
27.00	0.06	-0.70	0.70	0.16	Pass
28.00	0.05	-0.70	0.70	0.17	Pass
29.00	0.02	-0.70	0.70	0.16	Pass
30.00	0.01	-0.70	0.70	0.35	Pass
31.00	0.00	-0.70	0.70	0.16	Pass
32.00	-0.01	-0.70	0.70	0.16	Pass
33.00	-0.03	-0.70	0.70	0.16	Pass
34.00	-0.02	-0.70	0.70	0.16	Pass
39.00	-0.04	-0.70	0.70	0.16	Pass
44.00	-0.05	-0.70	0.70	0.16	Pass
49.00	-0.05	-0.70	0.70	0.16	Pass
54.00	-0.05	-0.70	0.70	0.16	Pass
59.00	-0.04	-0.70	0.70	0.16	Pass
64.00	-0.05	-0.70	0.70	0.16	Pass
69.00	-0.05	-0.70	0.70	0.16	Pass
74.00	-0.05	-0.70	0.70	0.16	Pass
79.00	-0.05	-0.70	0.70	0.16	Pass
84.00	0.04	-0.70	0.70	0.16	Pass
89.00	0.04	-0.70	0.70	0.16	Pass
94.00	0.02	-0.70	0.70	0.16	Pass
99.00	0.03	-0.70	0.70	0.16	Pass
104.00	0.01	-0.70	0.70	0.15	Pass
109.00	0.01	-0.70	0.70	0.15	Pass
114.00	0.01	-0.70	0.70	0.15	Pass
115.00	0.01	-0.70	0.70	0.15	Pass
116.00	0.01	-0.70	0.70	0.15	Pass
117.00	0.01	-0.70	0.70	0.15	Pass
118.00	0.00	-0.70	0.70	0.15	Pass
119.00	0.01	-0.70	0.70	0.15	Pass
120.00	-0.01	-0.70	0.70	0.15	Pass

-- End of measurement results--

Peak Rise Time

Peak rise time performed according to IEC 60651:2001 9.4.4 and ANSI S1.4:1983 (R2006) 8.4.4

Amplitude [dB]	Duration [μs]		Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
116.15	40	Negative Pulse	117.53	116.05	118.05	0.15	Pass
		Positive Pulse	117.49	116.01	118.01	0.15	Pass
	30	Negative Pulse	116.35	116.05	118.05	0.15	Pass
		Positive Pulse	116.49	116.01	118.01	0.15	Pass

-- End of measurement results--

Positive Pulse Crest Factor**200 μs pulse tests at 2.0, 12.0, 22.0, 32.0 dB below Overload Limit**

Crest Factor measured according to IEC 60651:2001 9.4.2 and ANSI S1.4:1983 (R2006) 8.4.2

Amplitude [dB]	Crest Factor	Test Result [dB]	Limits [dB]	Expanded Uncertainty [dB]	Result
114.15	3	OVLD	± 0.50	0.15 ‡	Pass
	5	OVLD	± 1.00	0.15 ‡	Pass
	10	OVLD	± 1.50	0.15 ‡	Pass
104.15	3	-0.16	± 0.50	0.15 ‡	Pass
	5	-0.17	± 1.00	0.16 ‡	Pass
	10	OVLD	± 1.50	0.15 ‡	Pass
94.15	3	-0.12	± 0.50	0.15 ‡	Pass
	5	-0.10	± 1.00	0.15 ‡	Pass
	10	-0.18	± 1.50	0.15 ‡	Pass
84.15	3	-0.14	± 0.50	0.15 ‡	Pass
	5	-0.14	± 1.00	0.15 ‡	Pass
	10	-0.18	± 1.50	0.15 ‡	Pass

-- End of measurement results--

Negative Pulse Crest Factor**200 μs pulse tests at 2.0, 12.0, 22.0, 32.0 dB below Overload Limit**

Crest Factor measured according to IEC 60651:2001 9.4.2 and ANSI S1.4:1983 (R2006) 8.4.2

Amplitude [dB]	Crest Factor	Test Result [dB]	Limits [dB]	Expanded Uncertainty [dB]	Result
114.15	3	OVLD	± 0.50	0.15 ‡	Pass
	5	OVLD	± 1.00	0.15 ‡	Pass
	10	OVLD	± 1.50	0.15 ‡	Pass
104.15	3	-0.15	± 0.50	0.15 ‡	Pass
	5	-0.14	± 1.00	0.15 ‡	Pass
	10	OVLD	± 1.50	0.15 ‡	Pass
94.15	3	-0.13	± 0.50	0.15 ‡	Pass
	5	-0.12	± 1.00	0.15 ‡	Pass
	10	-0.15	± 1.50	0.15 ‡	Pass
84.15	3	-0.14	± 0.50	0.15 ‡	Pass
	5	-0.13	± 1.00	0.15 ‡	Pass
	10	-0.17	± 1.50	0.15 ‡	Pass

-- End of measurement results--

Gain

Gain measured according to IEC 61672-3:2013 17.3 and 17.4 and ANSI S1.4-2014 Part 3: 17.3 and 17.4

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
0 dB Gain	84.02	83.90	84.10	0.15	Pass
0 dB Gain, Linearity	21.09	20.30	21.70	0.16	Pass
OBA Low Range	84.00	83.90	84.10	0.15	Pass
OBA Normal Range	84.00	83.20	84.80	0.15	Pass

-- End of measurement results--

Broadband Noise Floor

Self-generated noise measured according to IEC 61672-3:2013 11.2 and ANSI S1.4-2014 Part 3: 11.2

Measurement	Test Result [dB]	Upper limit [dB]	Result
A-weight Noise Floor	6.80	16.00	Pass
C-weight Noise Floor	11.18	18.00	Pass
Z-weight Noise Floor	19.51	25.00	Pass

-- End of measurement results--

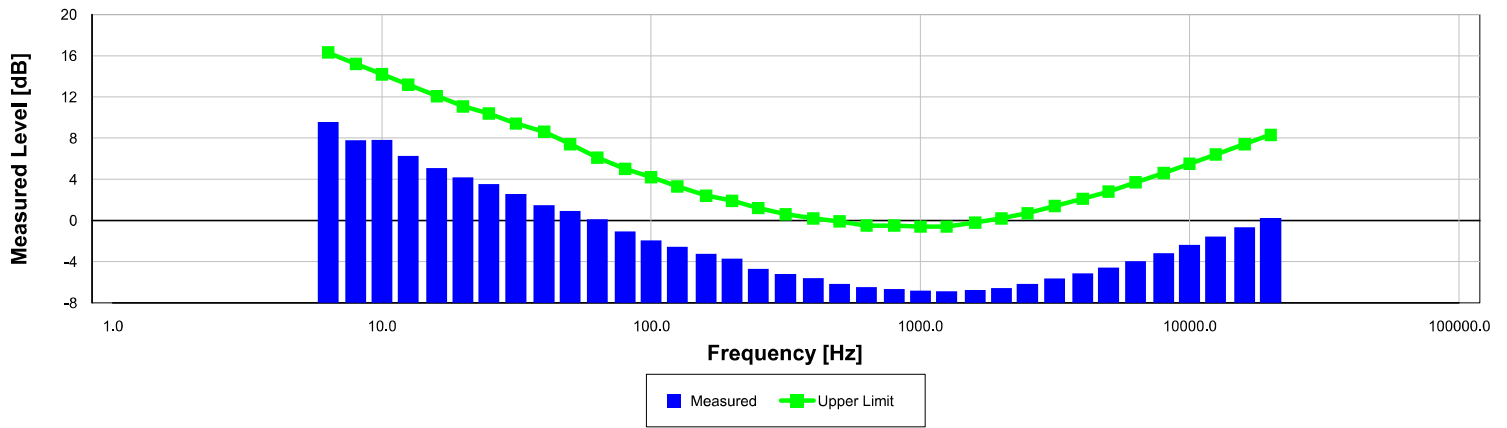
Total Harmonic Distortion

Measured using 1/3-Octave filters

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
10 Hz Signal	113.27	112.35	113.95	0.15	Pass
THD	-58.29		-50.00	0.01 ‡	Pass
THD+N	-56.50		-50.00	0.01 ‡	Pass

-- End of measurement results--

1/3-Octave Self-Generated Noise



The SLM is set to low range.

Frequency [Hz]	Test Result [dB]	Upper limit [dB]	Result
6.30	9.55	16.30	Pass
8.00	7.78	15.20	Pass
10.00	7.82	14.20	Pass
12.50	6.28	13.20	Pass
16.00	5.09	12.10	Pass
20.00	4.19	11.10	Pass
25.00	3.53	10.40	Pass
31.50	2.58	9.40	Pass
40.00	1.48	8.60	Pass
50.00	0.92	7.40	Pass
63.00	0.11	6.10	Pass
80.00	-1.07	5.00	Pass
100.00	-1.94	4.20	Pass
125.00	-2.55	3.30	Pass
160.00	-3.23	2.40	Pass
200.00	-3.72	1.90	Pass
250.00	-4.69	1.20	Pass
315.00	-5.18	0.60	Pass
400.00	-5.59	0.20	Pass
500.00	-6.16	-0.10	Pass
630.00	-6.48	-0.50	Pass
800.00	-6.65	-0.50	Pass
1,000.00	-6.81	-0.60	Pass
1,250.00	-6.87	-0.60	Pass
1,600.00	-6.74	-0.20	Pass
2,000.00	-6.57	0.20	Pass
2,500.00	-6.15	0.70	Pass
3,150.00	-5.65	1.40	Pass
4,000.00	-5.14	2.10	Pass
5,000.00	-4.59	2.80	Pass
6,300.00	-3.96	3.70	Pass
8,000.00	-3.18	4.60	Pass
10,000.00	-2.38	5.50	Pass
12,500.00	-1.56	6.40	Pass
16,000.00	-0.67	7.40	Pass
20,000.00	0.24	8.30	Pass

-- End of measurement results--

-- End of Report--

Signatory: Ron Harris

LARSON DAVIS - A PCB PIEZOTRONICS DIV.
1681 West 820 North
Provo, UT 84601, United States
716-684-0001





NSAI

National Metrology Laboratory

Certificate of Calibration

Issued to Fehily Timoney & Company
J5 Plaza
North Business Park
North Road
Dublin 11

Attention of Maureen Marsden

Certificate Number	220035
Item Calibrated	Svantek SVAN 977 Sound Level Meter with ACO 7052E Microphone
Serial Number	34876 (SLM) and 56429 (Microphone)
ID Number	None
Order Number	7018
Date Received	06 Jan 2022
NML Procedure Number	AP-NM-09

Method The above sound level meter was allowed to stabilise for a suitable period in laboratory conditions. It was then calibrated by carrying out the verification tests detailed in IEC 61672-3 (2006), *Periodic tests, specification for the verification of sound level meters*. This standard specifies a procedure for the periodic verification of conformance of a sound level meter or integrating-averaging meter to IEC 61672-1 (2003).

Calibration Standards Norsonic 1504A Calibration System incorporating:
SR DS360 Signal Generator, No. 0735 [Cal Due Date: 10 Jun 2022]
Agilent 34401A Digital Multimeter, No. 0736 [Cal Due Date: 10 Jun 2022]
B&K 4134 Measuring Microphone, No. 0744 [Cal Due Date: 03 Jun 2023]
B&K 4228 Pistonphone, No. 0740 [Cal Due Date: 04 Jun 2023]
B&K 4226 Acoustical Calibrator, No. 0150 [Cal Due Date: 07 Oct 2022]

Calibrated by

David Fleming

Approved by

Paul Hetherington

Date of Calibration

18 Jan 2022

Date of Issue

18 Jan 2022



This certificate is consistent with Calibration and Measurement Capabilities (CMC's) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures. Under the MRA, all participating Institutes recognize the validity of each other's calibration certificates and measurement reports for quantities, ranges and measurement uncertainties specified in Appendix C (for details see www.bipm.org)

APPENDIX 8.3

Noise Sensitive Location Details

Table 8.3.1: Noise Sensitive locations. There are gaps in the sequence of receptor numbers as commercial only properties are excluded

Receptor ID	Description	ITM (Easting)	ITM(Northing)
1	Residential & Commercial	520548	657134.7
2	Residential & Commercial	521637.7	657373.5
3	Residential & Commercial	518989.7	657436.9
4	Residential & Commercial	519537	657454.3
5	Residential	519016.3	657468.1
6	Residential	518612	657676.2
7	Residential & Commercial	521511.8	657636.2
8	Residential	519478.7	657718.4
9	Residential	519381.6	657737.3
10	Residential	520392	657736.7
11	Residential	520136.1	657769
12	Residential & Commercial	520542.3	657860.4
13	Residential	521916.5	657947.4
14	Residential & Commercial	521344.8	657970.6
15	Residential & Commercial	521344.8	657970.6
16	Residential & Commercial	521344.8	657970.6
17	Residential & Commercial	521344.8	657970.6
18	Residential	520605.6	658036.3
19	Residential & Commercial	521892.4	658033.2
20	Residential	520461.1	658073.7
21	Residential	519217.3	658102.8
22	Residential	520119.7	658097.4
23	Residential	520934.1	658112.6
24	Residential	521085.2	658120.2
25	Residential	521157.9	658133.3

Receptor ID	Description	ITM (Easting)	ITM(Northing)
26	Residential	517351.5	658227.4
27	Residential	517429.5	658285.3
29	Residential	521700.7	658230.8
30	Residential	517742.6	658321.3
31	Residential & Commercial	517696	658357.6
32	Residential	518810.5	658347.3
33	Residential & Commercial	518850.6	658349.5
34	Residential & Commercial	521490.9	658307.1
35	Residential & Commercial	522213.9	658356.4
36	Residential & Commercial	517701.1	658496.2
37	Residential	522574.7	658442.7
38	Residential	522671.4	658463
39	Residential	523848.4	658474.3
40	Residential	522822.8	658507
41	Residential	518036.4	658596.3
42	Residential	522935.6	658541
43	Residential	521473.2	658580
44	Residential	523227.4	658558.5
45	Residential & Commercial	523165.5	658561.4
46	Residential	523356.7	658569.6
47	Residential & Commercial	522393.7	658603.8
48	Residential	523822	658586.7
49	Residential	523485.2	658593.3
50	Residential & Commercial	523455	658594.3
51	Residential	523536	658597.7
52	Residential & Commercial	521870.4	658649.4
53	Residential	519555	658735.8
54	Residential	517016	658790.5
55	Residential	518728.8	658765.3

Receptor ID	Description	ITM (Easting)	ITM(Northing)
56	Residential & Commercial	518785.9	658766.8
57	Residential & Commercial	522775.6	658702.6
58	Residential	523867.8	658721.8
60	Residential	523936.8	658743.4
61	Residential	524107.6	658748.9
62	Residential	524176.6	658755.3
63	Residential	524089.4	658775.3
64	Residential	524377.4	658797.7
65	Residential	520184.4	658887
66	Residential	523876.5	658837.1
67	Residential	516985	658984.6
68	Residential & Commercial	523502.3	658897
69	Residential	524295.6	658887
70	Residential & Commercial	519124	658980.9
71	Residential	524234.8	658908.2
72	Residential	524327.4	658910.6
73	Residential & Commercial	520567.7	658985.9
74	Residential	524316.6	658981.6
75	Residential	516970	659116.1
76	Residential	523501.7	659054.4
77	Residential & Commercial	517030.3	659165.6
78	Residential	516978.1	659212.8
79	Residential	523536.5	659105.9
80	Residential	522317.1	659136.3
81	Residential	517036.9	659242.7
82	Residential & Commercial	517030.6	659280.5
83	Residential	524323.7	659174.5
84	Residential	519932.7	659276.7
85	Residential	524315.9	659206.8
86	Residential & Commercial	523757.1	659220.8

Receptor ID	Description	ITM (Easting)	ITM(Northing)
87	Residential & Commercial	519759.5	659298.5
88	Residential	516894.7	659352.2
89	Residential	516836.5	659361.1
90	Residential & Commercial	523403	659264
91	Residential	517651.5	659366.2
92	Residential	524314.6	659263
93	Residential & Commercial	523379.1	659285.8
95	Residential & Commercial	517712.6	659384.7
96	Residential	517905.1	659384.3
97	Residential	524305.3	659318.1
98	Residential & Commercial	517635.5	659445.6
99	Residential & Commercial	520366.9	659426.3
100	Residential	519711.3	659452.9
101	Residential	522757.5	659444.7
102	Residential	519831.2	659502.9
103	Residential	517720.7	659540.1
104	Residential & Commercial	522898	659490.1
105	Residential	522973.5	659507.1
106	Residential & Commercial	522094.5	659530.9
107	Residential	523131.8	659528.6
108	Residential	518099.3	659621.1
109	Residential	523182.6	659547.8
110	Residential	520932.2	659603.1
111	Residential	523096.8	659574.8
112	Residential	517006.7	659677.6
113	Residential	518346.2	659655.9
114	Residential	519983.4	659637.3
115	Residential & Commercial	518797.4	659682
116	Residential	518771.3	659684.5

Receptor ID	Description	ITM (Easting)	ITM(Northing)
117	Residential	523023.9	659636.4
118	Residential	517023.1	659749.1
119	Residential	524224.8	659632.1
120	Residential & Commercial	521049.9	659690
121	Residential	520208.4	659711.6
122	Residential	522981.4	659668.7
123	Residential & Commercial	521863.6	659701.4
124	Residential	522939.2	659707.3
125	Residential	523010	659707.2
126	Residential	524214.9	659703.3
127	Residential	517561.7	659826.7
128	Residential	523209.5	659735.3
129	Residential & Commercial	523240.6	659748.2
130	Residential	524215.4	659737.5
131	Residential	524145	659756.2
132	Residential & Commercial	521330.3	659811.9
133	Residential	519387.9	659852.9
134	Residential	521340.6	659857.8
135	Residential	521518.9	659887.3
136	Residential	524160.7	659881.4
137	Residential	522007.4	659992
138	Residential	522090.7	659996.9
139	Residential	521914.2	660013.7
140	Residential	524210.4	659996.6
141	Residential	524159.7	660006.6
142	Residential	524220.5	660025.3
143	Residential	524169.3	660032.8
144	Residential	522209.1	660083.3
145	Residential	524194.6	660059
146	Residential	522289	660116.7
147	Residential	524200.3	660089.1
148	Residential	522330.1	660124.3
149	Residential	524189.4	660095.1

Receptor ID	Description	ITM (Easting)	ITM(Northing)
150	Residential	524242.5	660125.2
151	Residential	522676.4	660149.8
152	Residential	522470.1	660170.7
153	Residential	524346.6	660199.4
154	Residential	516812.1	660377.5
155	Residential	516599.9	660401.2
156	Residential & Commercial	516765.8	660407.7
157	Residential	516472	660435.5
158	Residential	524173.1	660323.6
159	Residential	516532.8	660458.8
160	Residential	524179.2	660342.5
161	Residential	524185.2	660360.8
162	Residential & Commercial	525009.1	660348.3
163	Residential	517281.5	660491.6
164	Residential	524214.7	660413.9
166	Residential	518571.5	660591.6
167	Residential	522708.5	660555.4
168	Residential & Commercial	522775.6	660575.9
169	Residential	524113.7	660572.4
170	Residential & Commercial	516444.5	660699.6
171	Residential & Commercial	522964	660628.2
172	Residential	516623.3	660732.7
173	Residential	516884.9	660735
174	Residential & Commercial	524053.1	660623
176	Residential & Commercial	516959.4	660749.7
178	Residential & Commercial	518142.1	660750.1
179	Residential	516671.5	660787.3
180	Residential	516990.2	660798.7
181	Residential	517066.1	660799.1
182	B	518400.2	660815.5

Receptor ID	Description	ITM (Easting)	ITM(Northing)
183	Residential	517175.9	660848.8
184	Residential	517116.3	660853.5
185	Residential	517189.7	660883.9
186	Residential	516485.1	660942.3
188	Residential	525512.7	660804.8
189	Residential	520172.6	660896.1
190	Residential	517314.7	660953.3
191	Residential & Commercial	517426.5	660956.7
192	Residential	516546.2	660979.5
193	Residential & Commercial	518926.3	660941.2
194	Residential	517359.5	660968.4
195	Residential & Commercial	516650.2	660986.8
196	Residential	523762	660880.6
197	Residential	523510.4	660889.6
198	Residential & Commercial	517519.6	661007
199	Residential & Commercial	516601.4	661056.1
200	Residential	523633.6	660955.8
201	Residential	517114	661082.7
202	Residential	525080.1	660987.3
203	Residential	520523.4	661093.3
204	Residential	517980.6	661199.5
205	Residential & Commercial	517612.9	661217.3
206	Residential & Commercial	523690.5	661124.6
207	Residential	518101.2	661224.4
208	Residential	518156.5	661238.8
209	Residential	518177.6	661241.8
210	Residential & Commercial	523958.1	661149.4
211	Residential & Commercial	520594	661226.4
212	Residential	525249.6	661221.3

Receptor ID	Description	ITM (Easting)	ITM(Northing)
213	Residential	518763.2	661331.7
214	Residential	517637	661361.4
215	Residential & Commercial	517658.9	661388.1
216	Residential	519044.2	661401.9
217	Residential	519955.2	661398.9
218	Residential & Commercial	524057.4	661355.2
219	Residential	518485.7	661498.4
220	Residential	520123.9	661501.8
221	Residential & Commercial	520086.5	661512.7
222	Residential & Commercial	520086.5	661512.7
223	Residential & Commercial	524059.6	661452.4
224	Residential	518712.1	661543.3
225	Residential	520119.9	661536.7
226	Residential	519936.1	661556.1
227	Residential	521045.1	661538
228	Residential	518683.4	661640.1
229	Residential	517498.6	661681.8
230	Residential & Commercial	520537.1	661634.9
231	Residential & Commercial	522116.1	661609.5
232	Residential	520868.1	661651.2
233	Residential & Commercial	523065.7	661618.2
234	Residential	520756.9	661655.7
235	Residential	523366.3	661652.5
236	Residential & Commercial	518109.3	661794.4
237	Residential & Commercial	522296.1	661752.1
238	Residential & Commercial	519502.7	661845.5
239	Residential	519435.9	661872.2
240	Residential	522586.7	661827.8

Receptor ID	Description	ITM (Easting)	ITM(Northing)
241	Residential	519472.9	661887.2
242	Residential	519303.3	661905.7
243	Residential & Commercial	523053.7	661872.8
244	Residential	522952.3	661899.4
245	Residential & Commercial	520076.2	661956.5
246	Residential	522590.8	662009.9
247	Residential & Commercial	518616.7	662085.4
248	Residential	521856.7	662034.9
249	Residential	521998.2	662115.5
250	Residential	518617.9	662195
251	Residential	521774.7	662143.5
252	Residential	521933.2	662146.4
253	Residential	521958.7	662149.8
254	Residential	520201.6	662187.5
255	Residential	522336.3	662156.4
256	Residential & Commercial	523116.6	662153.1
257	Residential	523158.2	662155.4
258	Residential	517539.1	662304.5
259	Residential & Commercial	518772.6	662299.2
260	Residential & Commercial	518813.6	662316.1
261	Residential	522295.1	662267.1
262	Residential	525077.5	662248.8
263	Residential & Commercial	523101.1	662300.3
264	Residential & Commercial	522730.2	662316.4
266	Residential & Commercial	524166.5	662327.8
267	Residential	525097.9	662336.3
268	Residential	525148.2	662366.3
269	Residential	523135.8	662412.1
270	Residential & Commercial	525104.2	662479

Receptor ID	Description	ITM (Easting)	ITM(Northing)
271	Residential & Commercial	517435.5	662609.2
272	Residential	523005.4	662530.7
273	Residential	525098.2	662513.1
274	Residential	524353.5	662526.6
275	Residential & Commercial	517747.6	662662.4
276	Residential	523522.6	662598.2
277	Residential	519953.7	662663.4
278	Residential & Commercial	523372.9	662628.3
279	Residential & Commercial	524297.6	662666.6
280	Residential	518104.8	662783.3
281	Residential	517948.8	662819
282	Residential	518157.5	662844
283	Residential	518295	662864.4
284	Residential & Commercial	522476.7	662810.5
285	Residential	518360.2	662880.5
286	Residential	518449.1	662892.4
287	Residential	522540.9	662835.7
288	Residential & Commercial	518169.6	662910.1
289	Residential	518767.6	662909.4
290	Residential	518487.1	662929.7
291	Residential & Commercial	518111.3	662939.7
292	Residential	518720	662949
293	Residential	518197.5	662988.2
294	Residential & Commercial	520013.6	662987.4
295	Residential	524457	662931.4
296	Residential	520126.6	663010.2
297	Residential	519572.7	663027.2
298	Residential	518873	663057
299	Residential	518589.9	663075.3

Receptor ID	Description	ITM (Easting)	ITM(Northing)
300	Residential & Commercial	524739	662989.3
301	Residential & Commercial	521612.1	663055.8
302	Residential & Commercial	519746.7	663118.1
303	Residential	524310.2	663048
304	Residential & Commercial	523556.1	663066.1
305	Residential & Commercial	519810.5	663171.6
306	Residential	518736.8	663195.1
307	Residential	519836.8	663193.6
308	Residential	519251.5	663220.2
309	Residential & Commercial	519103.8	663312.6
310	Residential	519353	663437.7
311	Residential & Commercial	523282	663390.3
312	Residential & Commercial	522129	663427
313	Residential	519007.1	663536.7
314	Residential	519535.4	663528.4
315	Residential	521929.3	663599.3
316	Residential	521903	663642.4
317	Residential & Commercial	518870.5	663730.1
318	Residential	523456.2	663686.9
319	Residential	521860.7	663732.4
320	Residential	521827	663759.3
321	Residential	521804.1	663789.2
322	Residential & Commercial	522108	663785.8
323	Residential	521782.1	663819.2
324	Residential	520897.6	663883.7
325	Residential & Commercial	520880.7	663896
326	Residential & Commercial	521793.3	663887.9

Receptor ID	Description	ITM (Easting)	ITM(Northing)
327	Residential	522062.4	663911.4
328	Residential	521698.7	663928.3
329	Residential	522096.9	663966
330	Residential & Commercial	521722.7	664025.6
331	Residential	521613	664032.4
332	Residential	521586.4	664055
333	Residential	521548	664077.1
334	Residential	521626.3	664084.3
335	Residential	521570.6	664144.9
336	Residential	521529.8	664168.2
337	Residential	521504	664187.5
338	Residential	521433.1	664221.1
161	Residential	524185.2	660360.8
162	Residential & Commercial	525009.1	660348.3
163	Residential	517281.5	660491.6
164	Residential	524214.7	660413.9
166	Residential	518571.5	660591.6
167	Residential	522708.5	660555.4
168	Residential & Commercial	522775.6	660575.9
169	Residential	524113.7	660572.4
170	Residential & Commercial	516444.5	660699.6
171	Residential & Commercial	522964	660628.2
172	Residential	516623.3	660732.7
173	Residential	516884.9	660735
174	Residential & Commercial	524053.1	660623
176	Residential & Commercial	516959.4	660749.7
178	Residential & Commercial	518142.1	660750.1
179	Residential	516671.5	660787.3
180	Residential	516990.2	660798.7
181	Residential	517066.1	660799.1

Receptor ID	Description	ITM (Easting)	ITM(Northing)
182	B	518400.2	660815.5
183	Residential	517175.9	660848.8
184	Residential	517116.3	660853.5
185	Residential	517189.7	660883.9
186	Residential	516485.1	660942.3
188	Residential	525512.7	660804.8
189	Residential	520172.6	660896.1
190	Residential	517314.7	660953.3
191	Residential & Commercial	517426.5	660956.7
192	Residential	516546.2	660979.5
193	Residential & Commercial	518926.3	660941.2
194	Residential	517359.5	660968.4
195	Residential & Commercial	516650.2	660986.8
196	Residential	523762	660880.6
197	Residential	523510.4	660889.6
198	Residential & Commercial	517519.6	661007
199	Residential & Commercial	516601.4	661056.1
200	Residential	523633.6	660955.8
201	Residential	517114	661082.7
202	Residential	525080.1	660987.3
203	Residential	520523.4	661093.3
204	Residential	517980.6	661199.5
205	Residential & Commercial	517612.9	661217.3
206	Residential & Commercial	523690.5	661124.6
207	Residential	518101.2	661224.4
208	Residential	518156.5	661238.8
209	Residential	518177.6	661241.8
210	Residential & Commercial	523958.1	661149.4
211	Residential & Commercial	520594	661226.4

Receptor ID	Description	ITM (Easting)	ITM(Northing)
212	Residential	525249.6	661221.3
213	Residential	518763.2	661331.7
214	Residential	517637	661361.4
215	Residential & Commercial	517658.9	661388.1
216	Residential	519044.2	661401.9
217	Residential	519955.2	661398.9
218	Residential & Commercial	524057.4	661355.2
219	Residential	518485.7	661498.4
220	Residential	520123.9	661501.8
221	Residential & Commercial	520086.5	661512.7
222	Residential & Commercial	520086.5	661512.7
223	Residential & Commercial	524059.6	661452.4
224	Residential	518712.1	661543.3
225	Residential	520119.9	661536.7
226	Residential	519936.1	661556.1
227	Residential	521045.1	661538
228	Residential	518683.4	661640.1
229	Residential	517498.6	661681.8
230	Residential & Commercial	520537.1	661634.9
231	Residential & Commercial	522116.1	661609.5
232	Residential	520868.1	661651.2
233	Residential & Commercial	523065.7	661618.2
234	Residential	520756.9	661655.7
235	Residential	523366.3	661652.5
236	Residential & Commercial	518109.3	661794.4
237	Residential & Commercial	522296.1	661752.1
238	Residential & Commercial	519502.7	661845.5
239	Residential	519435.9	661872.2

Receptor ID	Description	ITM (Easting)	ITM(Northing)
240	Residential	522586.7	661827.8
241	Residential	519472.9	661887.2
242	Residential	519303.3	661905.7
243	Residential & Commercial	523053.7	661872.8
244	Residential	522952.3	661899.4
245	Residential & Commercial	520076.2	661956.5
246	Residential	522590.8	662009.9
247	Residential & Commercial	518616.7	662085.4
248	Residential	521856.7	662034.9
249	Residential	521998.2	662115.5
250	Residential	518617.9	662195
251	Residential	521774.7	662143.5
252	Residential	521933.2	662146.4
253	Residential	521958.7	662149.8
254	Residential	520201.6	662187.5
255	Residential	522336.3	662156.4
256	Residential & Commercial	523116.6	662153.1
257	Residential	523158.2	662155.4
258	Residential	517539.1	662304.5
259	Residential & Commercial	518772.6	662299.2
260	Residential & Commercial	518813.6	662316.1
261	Residential	522295.1	662267.1
262	Residential	525077.5	662248.8
263	Residential & Commercial	523101.1	662300.3
264	Residential & Commercial	522730.2	662316.4
266	Residential & Commercial	524166.5	662327.8
267	Residential	525097.9	662336.3
268	Residential	525148.2	662366.3
269	Residential	523135.8	662412.1

Receptor ID	Description	ITM (Easting)	ITM(Northing)
270	Residential & Commercial	525104.2	662479
271	Residential & Commercial	517435.5	662609.2
272	Residential	523005.4	662530.7
273	Residential	525098.2	662513.1
274	Residential	524353.5	662526.6
275	Residential & Commercial	517747.6	662662.4
276	Residential	523522.6	662598.2
277	Residential	519953.7	662663.4
278	Residential & Commercial	523372.9	662628.3
279	Residential & Commercial	524297.6	662666.6
280	Residential	518104.8	662783.3
281	Residential	517948.8	662819
282	Residential	518157.5	662844
283	Residential	518295	662864.4
284	Residential & Commercial	522476.7	662810.5
285	Residential	518360.2	662880.5
286	Residential	518449.1	662892.4
287	Residential	522540.9	662835.7
288	Residential & Commercial	518169.6	662910.1
289	Residential	518767.6	662909.4
290	Residential	518487.1	662929.7
291	Residential & Commercial	518111.3	662939.7
292	Residential	518720	662949
293	Residential	518197.5	662988.2
294	Residential & Commercial	520013.6	662987.4
295	Residential	524457	662931.4
296	Residential	520126.6	663010.2
297	Residential	519572.7	663027.2
298	Residential	518873	663057

Receptor ID	Description	ITM (Easting)	ITM(Northing)
299	Residential	518589.9	663075.3
300	Residential & Commercial	524739	662989.3
301	Residential & Commercial	521612.1	663055.8
302	Residential & Commercial	519746.7	663118.1
303	Residential	524310.2	663048
304	Residential & Commercial	523556.1	663066.1
305	Residential & Commercial	519810.5	663171.6
306	Residential	518736.8	663195.1
307	Residential	519836.8	663193.6
308	Residential	519251.5	663220.2
309	Residential & Commercial	519103.8	663312.6
310	Residential	519353	663437.7
311	Residential & Commercial	523282	663390.3
312	Residential & Commercial	522129	663427
313	Residential	519007.1	663536.7
314	Residential	519535.4	663528.4
315	Residential	521929.3	663599.3
316	Residential	521903	663642.4
317	Residential & Commercial	518870.5	663730.1
318	Residential	523456.2	663686.9
319	Residential	521860.7	663732.4
320	Residential	521827	663759.3
321	Residential	521804.1	663789.2
322	Residential & Commercial	522108	663785.8
323	Residential	521782.1	663819.2
324	Residential	520897.6	663883.7
325	Residential & Commercial	520880.7	663896

Receptor ID	Description	ITM (Easting)	ITM(Northing)
326	Residential & Commercial	521793.3	663887.9
327	Residential	522062.4	663911.4
328	Residential	521698.7	663928.3
329	Residential	522096.9	663966
330	Residential & Commercial	521722.7	664025.6
331	Residential	521613	664032.4
332	Residential	521586.4	664055
333	Residential	521548	664077.1
334	Residential	521626.3	664084.3
335	Residential	521570.6	664144.9
336	Residential	521529.8	664168.2
337	Residential	521504	664187.5
338	Residential	521433.1	664221.1

APPENDIX 8.4

Sound Power Level Data for Wind Turbines

Table 8.4.1: Wind Turbine (Vestas V136 4.5MW) Sound Power Levels, dB LWA at hub height 82m (with trailing edge serrations)

Wind Speed (m/s)	2	3	4	5	6	7 to cut out
Overall Sound Power level	90.9	91.4	94.7	99.6	103.3	103.9

Table 8.4.2: Wind Turbine (Vestas V136 4.5MW) – Typical 1/1 octave band spectrum for 63 Hz to 8 kHz.

1/1 oct. band, center freq.	63	125	250	500	1000	2000	4000	8000	Overall
2.1	71.1	78.0	82.6	85.1	85.3	83.3	79.1	72.7	90.9
3.0	71.6	79.1	84.0	86.2	85.8	82.7	77.1	68.6	91.4
4.0	75.1	82.5	87.2	89.5	89.1	86.1	80.5	72.2	94.7
5.0	80.1	87.2	91.8	94.1	94.0	91.3	86.4	78.9	99.6
6.0	83.9	90.9	95.4	97.7	97.6	95.2	90.4	83.3	103.3
7.0	84.5	91.4	96.0	98.3	98.2	95.9	91.2	84.2	103.9
8.0	84.5	91.1	95.6	98.0	98.2	96.3	92.2	86.0	103.9
9.0	84.5	90.7	95.1	97.5	98.1	96.7	93.5	88.4	103.9
10.0	84.6	90.5	94.7	97.2	97.9	96.9	94.3	89.8	103.9
11.0	84.7	90.5	94.6	97.0	97.9	97.0	94.5	90.4	103.9
12.0	85.0	90.6	94.5	97.0	97.8	97.0	94.6	90.6	103.9
13.0	85.3	90.7	94.6	96.9	97.7	97.0	94.6	90.8	103.9
14.0	85.5	90.9	94.7	97.0	97.7	96.9	94.6	90.7	103.9
14.3 to cut out	85.6	91.0	94.7	97.0	97.7	96.9	94.5	90.7	103.9

Table 8.4.3: Wind Turbine (Vestas V136 4.0MW) Octave Band Noise Levels, dB(A) for sound optimised mode at Standardised 10m Height Wind Speeds (with trailing edge serrations) 82m hub height (Vestas V136 4.5MW)

1/1 oct. band, center freq.	63	125	250	500	1000	2000	4000	8000	Overall
SO1 (6m/s)	82.5	90.8	95.8	97.1	95.0	90.7	83.5	73.2	101.7
SO1 (7m/s)	82.5	90.8	95.9	97.3	95.0	90.6	83.5	73.2	101.8
SO1 (8m/s)	83.5	91.4	96.1	97.5	95.0	90.7	83.6	73.6	102.0
SO2 (6m/s)	81.1	88.9	93.7	94.6	92.5	88.3	81.2	71.1	99.4
SO2 (7m/s)	81.7	89.2	93.8	94.5	92.5	88.4	81.5	71.8	99.5
SO2 (8m/s)	81.6	89.1	93.7	94.6	92.6	88.7	82.0	72.5	99.5

APPENDIX 8.5

Predicted Noise Levels from Cloonkett Windfarm at Nearby Noise Sensitive Locations

Table 8.5-1 presents the predicted noise levels (L_{A90}) from wind turbines for the Cloonkett Wind Farm at noise sensitive locations for Standardised 10m height wind speeds of 2m/s to 14m/s. The numbering is not sequential as only the noise sensitive locations within the 35 dB L_{A90} noise contour are presented. Commercial receptors, derelict and uninhabited dwellings were not considered.

Table 8.5-1: Predicted noise levels (L_{A90}) from Cloonkett Wind Farm at Noise Sensitive Locations for Standardised 10m Wind Speeds of 2 m/s to 14 m/s (unmitigated)

Receptor ID	Predicted Noise Level (dB L_{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
1	14	15.1	18.4	23.1	24.9	27.1	27	26.7	26.4	26.3	26.4	26.4	26.6
2	14.5	15.5	18.8	23.5	25.5	27.6	27.5	27.1	26.9	26.8	26.8	26.9	27
3	14	15.1	18.4	23.1	24.7	27.1	27	26.6	26.4	26.3	26.4	26.4	26.5
4	14.6	15.7	19	23.7	25.4	27.7	27.6	27.3	27	27	27	27	27.2
5	14.1	15.2	18.5	23.2	24.8	27.2	27.1	26.8	26.5	26.5	26.5	26.5	26.7
6	14.2	15.3	18.6	23.3	24.8	27.3	27.2	26.9	26.6	26.5	26.6	26.6	26.8
7	15.5	16.5	19.8	24.5	26.5	28.6	28.4	28.1	27.8	27.8	27.8	27.8	28
8	15.5	16.6	19.9	24.6	26.2	28.6	28.5	28.2	27.9	27.8	27.9	27.9	28
9	15.5	16.6	19.9	24.5	26.1	28.6	28.5	28.1	27.9	27.8	27.8	27.9	28
10	16.2	17.2	20.5	25.2	26.9	29.2	29.1	28.8	28.5	28.4	28.5	28.5	28.6
11	16.2	17.3	20.6	25.2	26.9	29.3	29.2	28.8	28.6	28.5	28.5	28.5	28.7
12	16.7	17.7	21	25.7	27.4	29.7	29.6	29.3	29	29	29	29	29.1
13	16.2	17.3	20.6	25.2	27.3	29.3	29.2	28.8	28.6	28.5	28.5	28.5	28.7
14	16.8	17.9	21.2	25.9	27.8	29.9	29.8	29.5	29.2	29.1	29.1	29.2	29.3
15	16.8	17.9	21.2	25.9	27.8	29.9	29.8	29.5	29.2	29.1	29.1	29.2	29.3
16	16.8	17.9	21.2	25.9	27.8	29.9	29.8	29.5	29.2	29.1	29.1	29.2	29.3

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
17	16.8	17.9	21.2	25.9	27.8	29.9	29.8	29.5	29.2	29.1	29.1	29.2	29.3
18	17.4	18.5	21.8	26.5	28.1	30.5	30.4	30	29.8	29.7	29.7	29.7	29.9
19	16.5	17.6	20.9	25.6	27.6	29.7	29.5	29.2	28.9	28.8	28.9	28.9	29
20	17.6	18.6	21.9	26.6	28.3	30.6	30.5	30.2	29.9	29.9	29.9	29.9	30
21	16.7	17.8	21.1	25.8	27.2	29.8	29.7	29.4	29.1	29	29	29.1	29.2
22	17.6	18.7	22	26.6	28.2	30.6	30.5	30.2	30	29.9	29.9	29.9	30
23	17.7	18.7	22	26.7	28.5	30.7	30.6	30.3	30	30	30	30	30.1
24	17.6	18.7	22	26.7	28.5	30.7	30.6	30.3	30	29.9	29.9	30	30.1
25	17.7	18.7	22	26.7	28.5	30.7	30.6	30.3	30	29.9	29.9	30	30.1
26	13	14.1	17.4	22.1	23.6	26.1	26	25.7	25.4	25.4	25.4	25.4	25.6
27	13.3	14.4	17.7	22.4	23.9	26.5	26.3	26	25.8	25.7	25.7	25.8	25.9
28	17.6	18.6	21.9	26.6	28.6	30.7	30.5	30.2	29.9	29.8	29.9	29.9	30
29	17.6	18.6	21.9	26.6	28.6	30.7	30.5	30.2	29.9	29.9	29.9	29.9	30
30	14.3	15.4	18.7	23.3	24.8	27.4	27.3	26.9	26.7	26.6	26.6	26.7	26.8
31	14.3	15.3	18.6	23.3	24.8	27.4	27.2	26.9	26.7	26.6	26.6	26.7	26.8
32	17.1	18.1	21.4	26.1	27.4	30.1	30	29.7	29.4	29.4	29.4	29.4	29.5
33	17.2	18.2	21.5	26.2	27.5	30.2	30.1	29.8	29.5	29.4	29.5	29.5	29.6
34	18.1	19.2	22.5	27.2	29.1	31.2	31.1	30.8	30.5	30.4	30.4	30.5	30.6
35	17.3	18.4	21.7	26.4	28.5	30.5	30.3	30	29.7	29.6	29.6	29.7	29.8
36	14.7	15.7	19	23.7	25.1	27.8	27.6	27.3	27	27	27	27	27.2
37	17	18.1	21.4	26	28.2	30.2	30	29.6	29.4	29.3	29.3	29.3	29.5
38	16.9	17.9	21.2	25.9	28.1	30	29.9	29.5	29.2	29.2	29.2	29.2	29.3

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
39	14.2	15.3	18.6	23.3	25.5	27.4	27.2	26.8	26.6	26.5	26.6	26.6	26.7
40	16.7	17.8	21.1	25.8	28	29.9	29.7	29.3	29.1	29	29	29	29.2
41	16	17	20.3	25	26.3	29.1	28.9	28.6	28.4	28.3	28.3	28.3	28.4
42	16.6	17.6	20.9	25.6	27.9	29.8	29.6	29.2	28.9	28.9	28.9	28.9	29
43	19.5	20.5	23.8	28.5	30.4	32.6	32.4	32.1	31.8	31.8	31.8	31.8	31.9
44	15.9	17	20.3	25	27.3	29.1	28.9	28.6	28.3	28.2	28.3	28.3	28.4
45	16.1	17.2	20.5	25.2	27.4	29.3	29.1	28.7	28.5	28.4	28.4	28.5	28.6
46	15.7	16.7	20	24.7	27	28.9	28.7	28.3	28	28	28	28	28.2
47	18	19.1	22.4	27.1	29.2	31.2	31	30.6	30.4	30.3	30.3	30.3	30.4
48	14.5	15.6	18.9	23.6	25.9	27.8	27.6	27.2	26.9	26.9	26.9	26.9	27.1
49	15.4	16.5	19.8	24.5	26.7	28.6	28.4	28	27.8	27.7	27.7	27.8	27.9
50	15.5	16.6	19.9	24.5	26.8	28.7	28.5	28.1	27.9	27.8	27.8	27.9	28
51	15.3	16.4	19.7	24.4	26.6	28.5	28.3	27.9	27.7	27.6	27.6	27.7	27.8
52	19.2	20.3	23.6	28.3	30.3	32.3	32.2	31.8	31.6	31.5	31.5	31.5	31.6
53	20.4	21.4	24.7	29.4	30.6	33.3	33.3	33	32.7	32.7	32.6	32.7	32.8
54	13.2	14.3	17.6	22.3	23.7	26.4	26.2	25.9	25.6	25.6	25.6	25.7	25.8
55	18.8	19.8	23.1	27.8	29	31.8	31.7	31.4	31.1	31.1	31.1	31.1	31.2
56	19	20	23.3	28	29.1	32	31.9	31.6	31.3	31.2	31.2	31.3	31.4
57	17.6	18.6	21.9	26.6	28.8	30.7	30.5	30.2	29.9	29.8	29.8	29.9	30
58	14.8	15.8	19.1	23.8	26.1	28	27.8	27.4	27.2	27.1	27.1	27.2	27.3
59	14.7	15.8	19.1	23.8	26.1	27.9	27.7	27.4	27.1	27	27.1	27.1	27.2
60	14.6	15.7	19	23.7	26	27.8	27.6	27.3	27	27	27	27	27.2

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
61	14.2	15.3	18.6	23.2	25.5	27.4	27.2	26.8	26.6	26.5	26.5	26.6	26.7
62	14	15.1	18.4	23.1	25.4	27.2	27	26.7	26.4	26.3	26.4	26.4	26.6
63	14.3	15.4	18.7	23.3	25.6	27.5	27.3	26.9	26.7	26.6	26.6	26.7	26.8
64	13.5	14.6	17.9	22.6	24.9	26.8	26.6	26.2	26	25.9	25.9	26	26.1
65	21.9	22.9	26.2	30.9	32.1	34.8	34.7	34.5	34.2	34.2	34.1	34.1	34.2
66	15	16.1	19.4	24.1	26.4	28.2	28	27.7	27.4	27.3	27.4	27.4	27.5
67	13.5	14.5	17.8	22.5	24	26.6	26.5	26.1	25.9	25.8	25.8	25.9	26
68	16.3	17.3	20.6	25.3	27.6	29.5	29.3	28.9	28.6	28.6	28.6	28.6	28.7
69	14	15	18.3	23	25.3	27.2	27	26.6	26.4	26.3	26.3	26.4	26.5
70	21	22	25.3	30	31.1	34	33.9	33.6	33.4	33.3	33.3	33.3	33.4
71	14.2	15.3	18.6	23.2	25.5	27.4	27.2	26.8	26.6	26.5	26.5	26.6	26.7
72	13.9	15	18.3	23	25.3	27.1	26.9	26.6	26.3	26.3	26.3	26.3	26.5
73	22.6	23.6	26.9	31.6	32.9	35.5	35.5	35.2	35	34.9	34.9	34.9	35
74	14.1	15.2	18.5	23.2	25.5	27.3	27.1	26.7	26.5	26.4	26.5	26.5	26.6
75	13.6	14.7	18	22.7	24.1	26.8	26.6	26.3	26.1	26	26	26.1	26.2
76	16.8	17.8	21.1	25.8	28.1	29.9	29.7	29.4	29.1	29	29.1	29.1	29.2
77	13.9	15	18.3	23	24.4	27.1	26.9	26.6	26.3	26.3	26.3	26.3	26.5
78	13.8	14.9	18.2	22.9	24.3	27	26.8	26.5	26.2	26.2	26.2	26.2	26.4
79	16.8	17.9	21.2	25.8	28.1	30	29.8	29.4	29.2	29.1	29.1	29.1	29.3
80	20.7	21.7	25	29.7	32	33.8	33.7	33.3	33.1	33	33	33	33.1
81	14.1	15.2	18.5	23.1	24.5	27.2	27.1	26.7	26.5	26.4	26.4	26.5	26.6
82	14.1	15.2	18.5	23.2	24.6	27.3	27.1	26.8	26.5	26.5	26.5	26.5	26.7

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
83	14.5	15.5	18.8	23.5	25.8	27.7	27.5	27.1	26.9	26.8	26.8	26.9	27
84	24.4	25.4	28.7	33.4	34.4	37.2	37.2	37	36.8	36.7	36.7	36.7	36.8
85	14.6	15.6	18.9	23.6	25.9	27.8	27.6	27.2	26.9	26.9	26.9	26.9	27.1
86	16.4	17.5	20.8	25.5	27.7	29.6	29.4	29	28.8	28.7	28.7	28.8	28.9
87	24.4	25.4	28.7	33.4	34.3	37.2	37.2	37	36.8	36.7	36.7	36.7	36.8
88	13.7	14.8	18.1	22.8	24.2	26.9	26.7	26.4	26.1	26.1	26.1	26.2	26.3
89	13.5	14.6	17.9	22.6	24	26.7	26.5	26.2	26	25.9	25.9	26	26.1
90	17.8	18.8	22.1	26.8	29.1	31	30.7	30.4	30.1	30	30.1	30.1	30.2
91	16.9	17.9	21.2	25.9	27.1	30	29.8	29.5	29.2	29.1	29.2	29.2	29.3
92	14.7	15.7	19	23.7	26	27.9	27.7	27.3	27.1	27	27	27.1	27.2
93	17.9	19	22.3	27	29.3	31.1	30.9	30.5	30.3	30.2	30.2	30.2	30.3
94	21	22.1	25.3	30	32.4	34.2	34	33.6	33.4	33.3	33.3	33.3	33.4
95	17.2	18.2	21.5	26.2	27.4	30.3	30.1	29.8	29.6	29.5	29.5	29.5	29.6
96	18.1	19.1	22.4	27.1	28.2	31.2	31.1	30.7	30.5	30.4	30.4	30.4	30.5
97	14.8	15.9	19.2	23.9	26.2	28	27.8	27.4	27.2	27.1	27.2	27.2	27.3
98	17	18	21.3	26	27.2	30.1	29.9	29.6	29.3	29.3	29.3	29.3	29.4
99	26	26.9	30.2	34.9	35.9	38.7	38.8	38.6	38.3	38.3	38.2	38.2	38.3
100	25.6	26.5	29.8	34.6	35.4	38.3	38.4	38.2	38	37.9	37.9	37.9	38
101	20.8	21.9	25.2	29.8	32.2	34	33.8	33.5	33.2	33.1	33.1	33.1	33.2
102	26.2	27.1	30.4	35.1	35.9	38.9	38.9	38.8	38.6	38.5	38.5	38.5	38.6
103	17.6	18.7	22	26.6	27.8	30.7	30.6	30.2	30	29.9	29.9	29.9	30.1
104	20.5	21.5	24.8	29.5	31.9	33.7	33.5	33.1	32.9	32.8	32.8	32.8	32.9

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
105	20.3	21.3	24.6	29.3	31.7	33.5	33.3	32.9	32.7	32.6	32.6	32.6	32.7
106	23.6	24.6	27.9	32.6	35	36.7	36.6	36.2	36	35.9	35.9	35.9	36
107	19.8	20.8	24.1	28.8	31.1	32.9	32.7	32.4	32.1	32	32	32.1	32.2
108	20	21	24.3	29	29.9	33	32.9	32.6	32.3	32.3	32.2	32.3	32.4
109	19.6	20.7	24	28.7	31	32.8	32.6	32.3	32	31.9	31.9	31.9	32
110	27.3	28.2	31.5	36.2	37.5	40.1	40.2	39.9	39.7	39.6	39.6	39.5	39.6
111	20.1	21.1	24.4	29.1	31.5	33.3	33.1	32.7	32.5	32.4	32.4	32.4	32.5
112	14.6	15.6	18.9	23.6	25	27.7	27.6	27.2	27	26.9	26.9	27	27.1
113	21.7	22.7	26	30.7	31.5	34.8	34.6	34.3	34.1	34	34	34	34.1
114	27.7	28.6	31.9	36.6	37.3	40.2	40.3	40.3	40.1	40	40	40	40
115	25	26	29.3	34	34.6	38.1	37.9	37.7	37.5	37.4	37.4	37.4	37.4
116	24.9	25.8	29.1	33.8	34.5	37.9	37.8	37.5	37.3	37.2	37.2	37.2	37.3
117	20.7	21.7	25	29.7	32	33.9	33.6	33.3	33	33	32.9	33	33.1
118	14.7	15.8	19.1	23.8	25.1	27.9	27.7	27.4	27.1	27	27.1	27.1	27.2
119	15.7	16.8	20.1	24.8	27.1	29	28.7	28.4	28.1	28	28.1	28.1	28.2
120	27.8	28.7	32	36.7	38.1	40.7	40.7	40.4	40.2	40.1	40.1	40.1	40.2
121	28.7	29.6	32.9	37.6	38.3	41.1	41.4	41.3	41.1	41	41	41	41.1
122	21	22	25.3	30	32.4	34.2	34	33.6	33.4	33.3	33.3	33.3	33.4
123	25.6	26.5	29.8	34.5	36.9	38.7	38.5	38.2	37.9	37.9	37.8	37.8	37.9
124	21.4	22.4	25.7	30.4	32.7	34.5	34.3	34	33.7	33.7	33.6	33.6	33.7
125	21.1	22.1	25.4	30.1	32.4	34.2	34	33.7	33.4	33.3	33.3	33.3	33.4
126	15.9	17	20.3	25	27.2	29.1	28.9	28.6	28.3	28.2	28.2	28.3	28.4

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
127	17.4	18.4	21.7	26.4	27.5	30.5	30.3	30	29.7	29.7	29.7	29.7	29.8
128	20.3	21.3	24.6	29.3	31.6	33.5	33.3	32.9	32.6	32.6	32.6	32.6	32.7
129	20.2	21.2	24.5	29.2	31.5	33.4	33.2	32.8	32.6	32.5	32.5	32.5	32.6
130	16	17.1	20.3	25	27.3	29.2	29	28.6	28.4	28.3	28.3	28.3	28.5
131	16.3	17.4	20.7	25.3	27.6	29.5	29.3	28.9	28.7	28.6	28.6	28.6	28.8
132	28	28.9	32.2	36.9	38.8	41	40.9	40.6	40.4	40.3	40.3	40.3	40.3
133	29.4	30.3	33.6	38.3	38.8	42.3	42.2	42.1	41.9	41.8	41.8	41.8	41.8
134	28.4	29.3	32.6	37.3	39.2	41.4	41.3	41	40.8	40.7	40.7	40.7	40.7
135	28.1	29	32.3	37	39.3	41.2	41	40.7	40.5	40.4	40.4	40.4	40.5
136	16.5	17.6	20.9	25.5	27.8	29.7	29.5	29.1	28.9	28.8	28.8	28.8	29
137	27.5	28.4	31.7	36.4	39.1	40.6	40.5	40.2	39.9	39.8	39.8	39.8	39.9
138	27.2	28.1	31.4	36.1	38.8	40.3	40.1	39.8	39.6	39.5	39.5	39.5	39.5
139	28.1	29	32.3	37.1	39.8	41.2	41.1	40.8	40.6	40.5	40.5	40.4	40.5
140	16.5	17.6	20.9	25.5	27.8	29.7	29.5	29.1	28.9	28.8	28.8	28.8	29
141	16.7	17.8	21.1	25.8	28	30	29.7	29.4	29.1	29	29.1	29.1	29.2
142	16.5	17.6	20.9	25.6	27.8	29.7	29.5	29.1	28.9	28.8	28.8	28.9	29
143	16.8	17.8	21.1	25.8	28	30	29.7	29.4	29.1	29	29.1	29.1	29.2
144	27.3	28.2	31.5	36.2	38.9	40.4	40.3	40	39.7	39.6	39.6	39.6	39.7
145	16.7	17.7	21	25.7	27.9	29.9	29.7	29.3	29.1	29	29	29	29.1
146	27.1	28.1	31.4	36.1	38.7	40.3	40.1	39.8	39.5	39.5	39.5	39.4	39.5
147	16.7	17.8	21.1	25.8	28	29.9	29.7	29.3	29.1	29	29	29.1	29.2
148	27	27.9	31.2	35.9	38.5	40.1	39.9	39.6	39.4	39.3	39.3	39.3	39.3

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
149	16.8	17.8	21.1	25.8	28	30	29.8	29.4	29.2	29.1	29.1	29.1	29.2
150	16.6	17.6	20.9	25.6	27.8	29.8	29.6	29.2	29	28.9	28.9	28.9	29
151	25.2	26.1	29.4	34.1	36.5	38.3	38.1	37.8	37.5	37.5	37.4	37.4	37.5
152	26.5	27.4	30.7	35.5	38	39.6	39.5	39.1	38.9	38.8	38.8	38.8	38.9
153	16.3	17.3	20.6	25.3	27.5	29.5	29.2	28.9	28.6	28.5	28.6	28.6	28.7
154	14.2	15.3	18.6	23.3	24.6	27.4	27.2	26.9	26.6	26.5	26.6	26.6	26.7
155	13.4	14.5	17.8	22.4	23.9	26.5	26.4	26	25.8	25.7	25.8	25.8	25.9
156	14	15.1	18.4	23.1	24.5	27.2	27	26.7	26.4	26.4	26.4	26.4	26.6
157	12.9	14	17.3	22	23.5	26.1	25.9	25.6	25.3	25.3	25.3	25.4	25.5
158	17.2	18.3	21.6	26.3	28.4	30.4	30.2	29.9	29.6	29.5	29.5	29.6	29.7
159	13.1	14.2	17.5	22.2	23.7	26.3	26.1	25.8	25.6	25.5	25.5	25.6	25.7
160	17.2	18.3	21.6	26.3	28.4	30.4	30.2	29.9	29.6	29.5	29.5	29.6	29.7
161	17.2	18.3	21.6	26.3	28.4	30.4	30.2	29.9	29.6	29.5	29.5	29.6	29.7
162	13.7	14.8	18.1	22.8	25.1	27	26.8	26.4	26.1	26.1	26.1	26.2	26.3
163	16.3	17.4	20.7	25.4	26.6	29.5	29.3	29	28.7	28.6	28.6	28.7	28.8
164	17.2	18.2	21.5	26.2	28.4	30.4	30.1	29.8	29.5	29.5	29.5	29.5	29.6
165	13.8	14.9	18.2	22.9	24.3	27	26.8	26.5	26.2	26.2	26.2	26.2	26.4
166	26	26.9	30.2	34.9	35.5	39.1	38.9	38.6	38.4	38.3	38.3	38.3	38.4
167	28	28.9	32.2	36.9	39	41.1	40.9	40.6	40.4	40.3	40.3	40.3	40.4
168	27.6	28.5	31.8	36.5	38.5	40.7	40.6	40.3	40	40	40	39.9	40
169	17.9	18.9	22.2	26.9	29	31.1	30.9	30.5	30.3	30.2	30.2	30.2	30.3
170	12.8	13.9	17.2	21.9	23.3	26	25.8	25.5	25.2	25.2	25.2	25.2	25.4

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
171	26.4	27.3	30.6	35.3	37.2	39.5	39.4	39.1	38.8	38.8	38.7	38.7	38.8
172	13.4	14.5	17.8	22.5	23.9	26.6	26.4	26.1	25.8	25.8	25.8	25.9	26
173	14.5	15.5	18.8	23.5	24.9	27.6	27.4	27.1	26.8	26.8	26.8	26.8	27
174	18.3	19.3	22.6	27.3	29.4	31.5	31.3	30.9	30.6	30.6	30.6	30.6	30.7
175	14.5	15.6	18.9	23.6	25	27.7	27.5	27.2	26.9	26.9	26.9	26.9	27
176	14.8	15.8	19.1	23.8	25.2	27.9	27.7	27.4	27.1	27.1	27.1	27.1	27.3
177	14.9	15.9	19.2	23.9	25.3	28	27.9	27.5	27.3	27.2	27.2	27.3	27.4
178	21.5	22.5	25.8	30.5	31.3	34.6	34.4	34.1	33.9	33.8	33.8	33.8	33.9
179	13.6	14.7	18	22.7	24.1	26.7	26.6	26.2	26	25.9	26	26	26.1
180	14.9	15.9	19.2	23.9	25.3	28	27.8	27.5	27.3	27.2	27.2	27.2	27.4
181	15.2	16.3	19.6	24.2	25.6	28.3	28.2	27.8	27.6	27.5	27.5	27.6	27.7
182	23.4	24.4	27.6	32.4	33.1	36.5	36.3	36	35.8	35.7	35.7	35.7	35.8
183	15.7	16.7	20	24.7	26	28.8	28.6	28.3	28	28	28	28	28.1
184	15.4	16.4	19.7	24.4	25.7	28.5	28.4	28	27.8	27.7	27.7	27.7	27.9
185	15.7	16.8	20.1	24.7	26	28.8	28.7	28.3	28.1	28	28	28.1	28.2
186	12.9	13.9	17.2	21.9	23.4	26	25.9	25.5	25.3	25.2	25.2	25.3	25.4
187	15.9	16.9	20.2	24.9	26.2	29	28.8	28.5	28.3	28.2	28.2	28.2	28.3
188	12.2	13.2	16.5	21.2	23.5	25.4	25.2	24.8	24.6	24.5	24.6	24.6	24.8
189	30.2	31.1	34.4	39.1	39.9	42.9	43	42.9	42.6	42.6	42.6	42.5	42.6
190	16.2	17.3	20.6	25.3	26.5	29.3	29.2	28.8	28.6	28.5	28.5	28.6	28.7
191	16.8	17.8	21.1	25.8	27	29.9	29.7	29.4	29.1	29.1	29.1	29.1	29.2
192	13	14.1	17.4	22.1	23.6	26.2	26	25.7	25.5	25.4	25.4	25.5	25.6

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
193	27.5	28.4	31.7	36.4	36.9	40.5	40.4	40.1	39.9	39.8	39.8	39.8	39.9
194	16.4	17.5	20.8	25.5	26.7	29.5	29.4	29	28.8	28.7	28.7	28.8	28.9
195	13.4	14.5	17.8	22.5	23.9	26.6	26.4	26.1	25.8	25.7	25.8	25.8	26
196	20.4	21.4	24.7	29.4	31.3	33.6	33.4	33	32.8	32.7	32.7	32.7	32.8
197	22.4	23.3	26.6	31.3	33.2	35.5	35.3	35	34.8	34.7	34.7	34.7	34.7
198	17.2	18.2	21.5	26.2	27.4	30.3	30.1	29.8	29.5	29.5	29.5	29.5	29.6
199	13.2	14.3	17.6	22.3	23.7	26.3	26.2	25.8	25.6	25.5	25.6	25.6	25.8
200	21.4	22.4	25.7	30.4	32.3	34.6	34.4	34	33.8	33.7	33.7	33.7	33.8
201	15.2	16.2	19.5	24.2	25.6	28.3	28.1	27.8	27.6	27.5	27.5	27.5	27.7
202	13.7	14.8	18.1	22.7	25	26.9	26.7	26.3	26.1	26	26.1	26.1	26.2
203	29.7	30.6	33.9	38.6	39.7	42.6	42.6	42.3	42.1	42	42	42	42.1
204	19.3	20.3	23.6	28.3	29.4	32.4	32.2	31.9	31.6	31.6	31.6	31.6	31.7
205	17.3	18.3	21.6	26.3	27.5	30.4	30.2	29.9	29.7	29.6	29.6	29.6	29.7
206	21	22	25.3	30	31.9	34.2	34	33.6	33.4	33.3	33.3	33.3	33.4
207	19.9	20.9	24.2	28.9	29.9	33	32.8	32.5	32.3	32.2	32.2	32.2	32.3
208	20.2	21.2	24.5	29.2	30.2	33.3	33.1	32.8	32.5	32.5	32.5	32.5	32.6
209	20.3	21.3	24.6	29.3	30.3	33.4	33.2	32.9	32.7	32.6	32.6	32.6	32.7
210	19.1	20.1	23.4	28.1	30.1	32.3	32.1	31.7	31.5	31.4	31.4	31.4	31.5
211	29.1	30	33.3	38	39.2	42	42	41.7	41.5	41.4	41.4	41.4	41.4
212	13	14.1	17.4	22.1	24.3	26.3	26	25.7	25.4	25.4	25.4	25.5	25.6
213	23.4	24.4	27.7	32.4	33.2	36.5	36.3	36	35.8	35.7	35.7	35.7	35.8
214	17.1	18.2	21.5	26.1	27.4	30.2	30.1	29.7	29.5	29.4	29.4	29.4	29.6

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
215	17.2	18.2	21.5	26.2	27.4	30.3	30.1	29.8	29.5	29.5	29.5	29.5	29.6
216	24.5	25.5	28.8	33.5	34.3	37.6	37.4	37.2	36.9	36.8	36.8	36.8	36.9
217	26.4	27.4	30.6	35.4	36.3	39.3	39.3	39	38.8	38.7	38.7	38.7	38.8
218	18.3	19.4	22.7	27.4	29.4	31.5	31.3	31	30.7	30.6	30.6	30.7	30.8
219	20.9	22	25.2	29.9	30.9	34	33.9	33.6	33.3	33.2	33.2	33.2	33.3
220	25.8	26.7	30	34.7	35.9	38.7	38.7	38.4	38.2	38.1	38.1	38	38.1
221	25.7	26.6	29.9	34.6	35.8	38.6	38.5	38.3	38	38	37.9	37.9	38
222	25.7	26.6	29.9	34.6	35.8	38.6	38.5	38.3	38	38	37.9	37.9	38
223	18.2	19.2	22.5	27.2	29.2	31.4	31.2	30.8	30.6	30.5	30.5	30.5	30.6
224	21.9	22.9	26.2	30.9	31.8	34.9	34.8	34.5	34.2	34.2	34.1	34.1	34.2
225	25.5	26.5	29.8	34.5	35.7	38.5	38.4	38.2	37.9	37.8	37.8	37.8	37.9
226	25.2	26.2	29.5	34.2	35.3	38.2	38.1	37.8	37.6	37.5	37.5	37.5	37.6
227	29	29.9	33.2	37.9	39.5	42.1	42	41.7	41.4	41.4	41.3	41.3	41.4
228	21.2	22.2	25.5	30.2	31.2	34.3	34.1	33.8	33.6	33.5	33.5	33.5	33.6
229	15.8	16.9	20.2	24.9	26.2	29	28.8	28.5	28.2	28.1	28.1	28.2	28.3
230	25.9	26.9	30.2	34.9	36.3	39	38.9	38.6	38.3	38.2	38.2	38.2	38.3
231	29.1	30	33.3	38	40	42.2	42	41.8	41.5	41.5	41.4	41.4	41.5
232	27.1	28.1	31.3	36.1	37.6	40.2	40.1	39.8	39.5	39.4	39.4	39.4	39.5
233	25.3	26.3	29.6	34.3	35.7	38.5	38.3	38	37.8	37.7	37.7	37.7	37.7
234	26.6	27.6	30.9	35.6	37.1	39.7	39.5	39.2	39	38.9	38.9	38.9	39
235	22.5	23.5	26.8	31.5	33.2	35.7	35.5	35.1	34.9	34.8	34.8	34.8	34.9
236	18	19.1	22.4	27.1	28.3	31.1	31	30.6	30.4	30.3	30.3	30.3	30.5

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
237	27.3	28.3	31.5	36.3	38.1	40.5	40.3	40	39.8	39.7	39.7	39.6	39.7
238	22.6	23.6	26.9	31.6	32.7	35.7	35.5	35.2	35	34.9	34.9	34.9	35
239	22.3	23.3	26.6	31.3	32.4	35.4	35.2	34.9	34.7	34.6	34.6	34.6	34.7
240	26	26.9	30.2	35	36.6	39.2	39	38.7	38.4	38.4	38.3	38.3	38.4
241	22.3	23.3	26.6	31.3	32.4	35.3	35.2	34.9	34.7	34.6	34.6	34.6	34.7
242	21.8	22.8	26.1	30.8	31.9	34.8	34.7	34.4	34.2	34.1	34.1	34.1	34.2
243	23.4	24.3	27.6	32.4	34	36.6	36.4	36	35.8	35.7	35.7	35.7	35.8
244	23.8	24.7	28	32.7	34.4	36.9	36.7	36.4	36.2	36.1	36.1	36.1	36.2
245	22.9	23.9	27.2	31.9	33.3	35.9	35.8	35.5	35.3	35.2	35.2	35.2	35.3
246	24.3	25.2	28.5	33.2	35.1	37.4	37.3	36.9	36.7	36.6	36.6	36.6	36.7
247	18.8	19.8	23.1	27.8	29.1	31.9	31.7	31.4	31.2	31.1	31.1	31.1	31.2
248	25.4	26.4	29.7	34.4	36.3	38.6	38.4	38.1	37.8	37.8	37.7	37.7	37.8
249	24.6	25.5	28.8	33.5	35.5	37.7	37.5	37.2	37	36.9	36.9	36.9	36.9
250	18.3	19.4	22.7	27.3	28.7	31.4	31.3	30.9	30.7	30.6	30.6	30.6	30.7
251	24.6	25.5	28.8	33.5	35.5	37.7	37.5	37.2	37	36.9	36.9	36.9	36.9
252	24.4	25.4	28.7	33.4	35.3	37.6	37.4	37	36.8	36.7	36.7	36.7	36.8
253	24.4	25.3	28.6	33.3	35.3	37.5	37.3	37	36.7	36.7	36.6	36.6	36.7
254	21.9	22.9	26.2	30.9	32.4	34.9	34.8	34.5	34.2	34.1	34.1	34.1	34.2
255	23.7	24.7	28	32.7	34.6	36.9	36.7	36.3	36.1	36	36	36	36.1
256	21.2	22.2	25.5	30.2	32.1	34.4	34.2	33.8	33.6	33.5	33.5	33.5	33.6
257	21	22	25.3	30	31.9	34.2	34	33.6	33.4	33.3	33.3	33.3	33.4
258	14.5	15.6	18.9	23.6	25.1	27.7	27.5	27.2	26.9	26.8	26.9	26.9	27

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
259	18.3	19.4	22.7	27.4	28.7	31.4	31.3	30.9	30.7	30.6	30.6	30.6	30.7
260	18.4	19.4	22.7	27.4	28.7	31.5	31.3	31	30.7	30.6	30.7	30.7	30.8
261	23	23.9	27.2	31.9	33.9	36.1	35.9	35.6	35.3	35.2	35.2	35.2	35.3
262	12.8	13.8	17.1	21.8	24.1	26	25.8	25.4	25.2	25.1	25.2	25.2	25.4
263	20.4	21.4	24.7	29.4	31.3	33.6	33.4	33	32.8	32.7	32.7	32.7	32.8
264	21.6	22.6	25.9	30.6	32.5	34.8	34.6	34.2	34	33.9	33.9	33.9	34
265	12.6	13.7	17	21.6	23.9	25.8	25.6	25.2	25	24.9	25	25	25.2
266	15.9	16.9	20.2	24.9	27	29.1	28.9	28.5	28.3	28.2	28.2	28.2	28.4
267	12.6	13.7	17	21.7	23.9	25.8	25.6	25.2	25	24.9	25	25	25.2
268	12.4	13.5	16.8	21.5	23.7	25.6	25.4	25	24.8	24.8	24.8	24.9	25
269	19.7	20.7	24	28.7	30.6	32.9	32.7	32.3	32	32	32	32	32.1
270	12.4	13.4	16.7	21.4	23.7	25.6	25.4	25	24.8	24.7	24.8	24.8	25
271	13.5	14.6	17.9	22.6	24.2	26.7	26.5	26.2	26	25.9	25.9	26	26.1
272	19.5	20.5	23.8	28.5	30.5	32.7	32.5	32.1	31.9	31.8	31.8	31.8	31.9
273	12.3	13.4	16.7	21.4	23.6	25.6	25.4	25	24.8	24.7	24.7	24.8	24.9
274	14.7	15.8	19.1	23.8	25.9	27.9	27.7	27.4	27.1	27	27.1	27.1	27.2
275	14.3	15.3	18.6	23.3	24.8	27.4	27.2	26.9	26.7	26.6	26.6	26.7	26.8
276	17.4	18.5	21.8	26.5	28.5	30.7	30.4	30.1	29.8	29.7	29.7	29.8	29.9
277	19.1	20.1	23.4	28.1	29.7	32.2	32	31.7	31.4	31.3	31.3	31.4	31.5
278	17.8	18.9	22.2	26.9	28.9	31	30.8	30.5	30.2	30.1	30.1	30.1	30.3
279	14.6	15.6	18.9	23.6	25.8	27.8	27.6	27.2	27	26.9	26.9	27	27.1
280	14.9	15.9	19.2	23.9	25.5	28	27.8	27.5	27.2	27.2	27.2	27.2	27.4

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
281	14.4	15.4	18.7	23.4	25	27.5	27.4	27	26.8	26.7	26.7	26.8	26.9
282	14.8	15.9	19.2	23.9	25.4	28	27.8	27.4	27.2	27.1	27.2	27.2	27.3
283	15.1	16.1	19.4	24.1	25.7	28.2	28.1	27.7	27.5	27.4	27.4	27.5	27.6
284	19.3	20.3	23.6	28.3	30.3	32.4	32.2	31.9	31.6	31.5	31.5	31.5	31.7
285	15.2	16.3	19.6	24.2	25.8	28.3	28.2	27.8	27.6	27.5	27.5	27.6	27.7
286	15.3	16.4	19.7	24.4	26	28.5	28.3	28	27.7	27.7	27.7	27.7	27.8
287	19	20	23.3	28	30.1	32.2	32	31.6	31.4	31.3	31.3	31.3	31.4
288	14.7	15.7	19	23.7	25.3	27.8	27.6	27.3	27	27	27	27	27.2
289	16	17	20.3	25	26.6	29.1	29	28.6	28.4	28.3	28.3	28.3	28.5
290	15.3	16.4	19.7	24.4	25.9	28.5	28.3	27.9	27.7	27.6	27.6	27.7	27.8
291	14.4	15.5	18.8	23.5	25.1	27.6	27.4	27.1	26.8	26.8	26.8	26.8	27
292	15.8	16.8	20.1	24.8	26.4	28.9	28.7	28.4	28.1	28.1	28.1	28.1	28.2
293	14.5	15.6	18.9	23.6	25.1	27.6	27.5	27.1	26.9	26.8	26.8	26.9	27
294	17.8	18.8	22.1	26.8	28.5	30.9	30.7	30.4	30.1	30	30	30.1	30.2
295	13.5	14.5	17.8	22.5	24.7	26.7	26.5	26.1	25.9	25.8	25.8	25.9	26
296	17.8	18.9	22.2	26.8	28.6	31	30.8	30.4	30.2	30.1	30.1	30.1	30.2
297	17	18	21.3	26	27.7	30.1	29.9	29.6	29.3	29.3	29.3	29.3	29.4
298	15.7	16.8	20.1	24.7	26.4	28.8	28.7	28.3	28.1	28	28	28.1	28.2
299	15.1	16.2	19.4	24.1	25.7	28.2	28.1	27.7	27.5	27.4	27.4	27.5	27.6
300	12.6	13.6	16.9	21.6	23.8	25.8	25.6	25.2	25	24.9	24.9	25	25.2
301	18.7	19.8	23.1	27.7	29.7	31.9	31.7	31.3	31.1	31	31	31	31.1
302	16.9	18	21.2	25.9	27.6	30	29.9	29.5	29.3	29.2	29.2	29.2	29.3

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
303	13.6	14.7	18	22.7	24.9	26.8	26.6	26.3	26	25.9	26	26	26.2
304	15.6	16.7	20	24.7	26.8	28.8	28.6	28.3	28	27.9	27.9	28	28.1
305	16.8	17.8	21.1	25.8	27.6	29.9	29.7	29.4	29.1	29.1	29.1	29.1	29.2
306	15	16.1	19.4	24	25.7	28.1	28	27.6	27.4	27.3	27.3	27.4	27.5
307	16.7	17.8	21.1	25.8	27.5	29.9	29.7	29.3	29.1	29	29	29.1	29.2
308	15.8	16.9	20.2	24.9	26.5	28.9	28.8	28.4	28.2	28.1	28.1	28.2	28.3
309	15.3	16.3	19.6	24.3	26	28.4	28.2	27.9	27.6	27.6	27.6	27.6	27.8
310	15.2	16.3	19.6	24.3	26	28.4	28.2	27.9	27.6	27.5	27.6	27.6	27.7
311	15.1	16.2	19.5	24.2	26.3	28.4	28.1	27.8	27.5	27.4	27.5	27.5	27.6
312	16.7	17.8	21.1	25.7	27.8	29.9	29.7	29.3	29.1	29	29	29	29.1
313	14.4	15.5	18.8	23.5	25.2	27.6	27.4	27	26.8	26.7	26.8	26.8	26.9
314	15.2	16.3	19.5	24.2	26	28.3	28.2	27.8	27.6	27.5	27.5	27.6	27.7
315	16.1	17.2	20.5	25.2	27.2	29.3	29.1	28.7	28.5	28.4	28.4	28.5	28.6
316	16	17	20.3	25	27.1	29.2	28.9	28.6	28.3	28.2	28.3	28.3	28.4
317	13.6	14.7	18	22.7	24.4	26.8	26.6	26.3	26	26	26	26.1	26.2
318	13.8	14.9	18.2	22.9	25.1	27.1	26.8	26.5	26.2	26.2	26.2	26.2	26.4
319	15.6	16.7	20	24.7	26.8	28.8	28.6	28.3	28	27.9	27.9	28	28.1
320	15.5	16.6	19.9	24.6	26.7	28.7	28.5	28.2	27.9	27.8	27.9	27.9	28
321	15.4	16.5	19.8	24.5	26.6	28.6	28.4	28.1	27.8	27.7	27.8	27.8	27.9
322	15.3	16.3	19.6	24.3	26.4	28.5	28.3	27.9	27.7	27.6	27.6	27.6	27.8
323	15.3	16.4	19.7	24.4	26.5	28.5	28.3	28	27.7	27.6	27.7	27.7	27.8
324	15.1	16.2	19.5	24.2	26.1	28.3	28.1	27.7	27.5	27.4	27.4	27.5	27.6

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)												
	2	3	4	5	6	7	8	9	10	11	12	13	14
325	15.1	16.1	19.4	24.1	26.1	28.2	28.1	27.7	27.4	27.4	27.4	27.4	27.6
326	15.1	16.1	19.4	24.1	26.2	28.3	28.1	27.7	27.5	27.4	27.4	27.5	27.6
327	14.8	15.9	19.2	23.9	26	28.1	27.9	27.5	27.2	27.2	27.2	27.2	27.4
328	15	16	19.3	24	26.1	28.2	28	27.6	27.4	27.3	27.3	27.3	27.5
329	14.6	15.7	19	23.7	25.8	27.8	27.6	27.3	27	27	27	27	27.2
330	14.6	15.7	19	23.7	25.7	27.8	27.6	27.2	27	26.9	27	27	27.1
331	14.6	15.7	19	23.7	25.7	27.8	27.6	27.3	27	26.9	27	27	27.1
332	14.5	15.6	18.9	23.6	25.7	27.7	27.5	27.2	26.9	26.9	26.9	26.9	27.1
333	14.5	15.5	18.8	23.5	25.6	27.7	27.5	27.1	26.9	26.8	26.8	26.9	27
334	14.4	15.5	18.8	23.5	25.6	27.6	27.4	27.1	26.8	26.8	26.8	26.8	27
335	14.2	15.3	18.6	23.3	25.4	27.4	27.2	26.9	26.6	26.6	26.6	26.6	26.8
336	14.2	15.2	18.5	23.2	25.3	27.4	27.2	26.8	26.6	26.5	26.5	26.6	26.7
337	14.1	15.2	18.5	23.2	25.2	27.3	27.1	26.7	26.5	26.4	26.5	26.5	26.6
338	14	15.1	18.4	23.1	25.1	27.2	27	26.6	26.4	26.3	26.4	26.4	26.5

Table 8.5-2: Predicted noise levels (L_{A90}) from Cloonkett Wind Farm at Noise Sensitive Locations for Standardised 10m Wind Speeds of 6 m/s to 8 m/s (mitigated)

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
1	24.9	27.1	27
2	25.5	27.6	27.5
3	24.7	27.1	27
4	25.4	27.7	27.6
5	24.8	27.2	27.1
6	24.8	27.3	27.2
7	26.5	28.6	28.4
8	26.2	28.6	28.5
9	26.1	28.6	28.5
10	26.9	29.2	29.1
11	26.9	29.3	29.2
12	27.4	29.7	29.6
13	27.3	29.3	29.2
14	27.8	29.9	29.8
15	27.8	29.9	29.8
16	27.8	29.9	29.8
17	27.8	29.9	29.8
18	28.1	30.5	30.4
19	27.6	29.7	29.5
20	28.3	30.6	30.5
21	27.2	29.8	29.7
22	28.2	30.6	30.5
23	28.5	30.7	30.6
24	28.5	30.7	30.6
25	28.5	30.7	30.6
26	23.6	26.1	26
27	23.9	26.5	26.3
28	28.6	30.7	30.5
29	28.6	30.7	30.5
30	24.8	27.4	27.3
31	24.8	27.4	27.2
32	27.4	30.1	30

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
33	27.5	30.2	30.1
34	29.1	31.2	31.1
35	28.5	30.5	30.3
36	25.1	27.8	27.6
37	28.2	30.2	30
38	28.1	30	29.9
39	25.5	27.4	27.2
40	28	29.9	29.7
41	26.3	29.1	28.9
42	27.9	29.8	29.6
43	30.4	32.6	32.4
44	27.3	29.1	28.9
45	27.4	29.3	29.1
46	27	28.9	28.7
47	29.2	31.2	31
48	25.9	27.8	27.6
49	26.7	28.6	28.4
50	26.8	28.7	28.5
51	26.6	28.5	28.3
52	30.3	32.3	32.2
53	30.6	33.3	33.3
54	23.7	26.4	26.2
55	29	31.8	31.7
56	29.1	32	31.9
57	28.8	30.7	30.5
58	26.1	28	27.8
59	26.1	27.9	27.7
60	26	27.8	27.6
61	25.5	27.4	27.2
62	25.4	27.2	27
63	25.6	27.5	27.3
64	24.9	26.8	26.6
65	32.1	34.8	34.7
66	26.4	28.2	28
67	24	26.6	26.5

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
68	27.6	29.5	29.3
69	25.3	27.2	27
70	31.1	34	33.9
71	25.5	27.4	27.2
72	25.3	27.1	26.9
73	32.9	35.5	35.5
74	25.5	27.3	27.1
75	24.1	26.8	26.6
76	28.1	29.9	29.7
77	24.4	27.1	26.9
78	24.3	27	26.8
79	28.1	30	29.8
80	32	33.8	33.7
81	24.5	27.2	27.1
82	24.6	27.3	27.1
83	25.8	27.7	27.5
84	34.4	37.2	37.2
85	25.9	27.8	27.6
86	27.7	29.6	29.4
87	34.3	37.2	37.2
88	24.2	26.9	26.7
89	24	26.7	26.5
90	29.1	31	30.7
91	27.1	30	29.8
92	26	27.9	27.7
93	29.3	31.1	30.9
94	32.4	34.2	34
95	27.4	30.3	30.1
96	28.2	31.2	31.1
97	26.2	28	27.8
98	27.2	30.1	29.9
99	35.9	38.7	38.8
100	35.4	38.3	38.4
101	32.2	34	33.8
102	35.9	38.9	38.9

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
103	27.8	30.7	30.6
104	31.9	33.7	33.5
105	31.7	33.5	33.3
106	35	36.7	36.6
107	31.1	32.9	32.7
108	29.9	33	32.9
109	31	32.8	32.6
110	37.5	40.1	40.2
111	31.5	33.3	33.1
112	25	27.7	27.6
113	31.5	34.8	34.6
114	37.3	40.2	40.3
115	34.6	38.1	37.9
116	34.5	37.9	37.8
117	32	33.9	33.6
118	25.1	27.9	27.7
119	27.1	29	28.7
120	38.1	40.7	40.7
121	38.3	41.1	41.4
122	32.4	34.2	34
123	36.9	38.7	38.5
124	32.7	34.5	34.3
125	32.4	34.2	34
126	27.2	29.1	28.9
127	27.5	30.5	30.3
128	31.6	33.5	33.3
129	31.5	33.4	33.2
130	27.3	29.2	29
131	27.6	29.5	29.3
132	38.8	41	40.9
133	38.8	42.3	42.2
134	39.2	41.4	41.3
135	39.3	41.2	41
136	27.8	29.7	29.5
137	39.1	40.6	40.5

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
138	38.8	40.3	40.1
139	39.8	41.2	41.1
140	27.8	29.7	29.5
141	28	30	29.7
142	27.8	29.7	29.5
143	28	30	29.7
144	38.9	40.4	40.3
145	27.9	29.9	29.7
146	38.7	40.3	40.1
147	28	29.9	29.7
148	38.5	40.1	39.9
149	28	30	29.8
150	27.8	29.8	29.6
151	36.5	38.3	38.1
152	38	39.6	39.5
153	27.5	29.5	29.2
154	24.6	27.4	27.2
155	23.9	26.5	26.4
156	24.5	27.2	27
157	23.5	26.1	25.9
158	28.4	30.4	30.2
159	23.7	26.3	26.1
160	28.4	30.4	30.2
161	28.4	30.4	30.2
162	25.1	27	26.8
163	26.6	29.5	29.3
164	28.4	30.4	30.1
165	24.3	27	26.8
166	35.5	39.1	38.9
167	39	41.1	40.9
168	38.5	40.7	40.6
169	29	31.1	30.9
170	23.3	26	25.8
171	37.2	39.5	39.4
172	23.9	26.6	26.4

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
173	24.9	27.6	27.4
174	29.4	31.5	31.3
175	25	27.7	27.5
176	25.2	27.9	27.7
177	25.3	28	27.9
178	31.3	34.6	34.4
179	24.1	26.7	26.6
180	25.3	28	27.8
181	25.6	28.3	28.2
182	33.1	36.5	36.3
183	26	28.8	28.6
184	25.7	28.5	28.4
185	26	28.8	28.7
186	23.4	26	25.9
187	26.2	29	28.8
188	23.5	25.4	25.2
189	39.9	42.9	43
190	26.5	29.3	29.2
191	27	29.9	29.7
192	23.6	26.2	26
193	36.9	40.5	40.4
194	26.7	29.5	29.4
195	23.9	26.6	26.4
196	31.3	33.6	33.4
197	33.2	35.5	35.3
198	27.4	30.3	30.1
199	23.7	26.3	26.2
200	32.3	34.6	34.4
201	25.6	28.3	28.1
202	25	26.9	26.7
203	39.7	42.6	42.6
204	29.4	32.4	32.2
205	27.5	30.4	30.2
206	31.9	34.2	34
207	29.9	33	32.8

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
208	30.2	33.3	33.1
209	30.3	33.4	33.2
210	30.1	32.3	32.1
211	39.2	42	42
212	24.3	26.3	26
213	33.2	36.5	36.3
214	27.4	30.2	30.1
215	27.4	30.3	30.1
216	34.3	37.6	37.4
217	36.3	39.3	39.3
218	29.4	31.5	31.3
219	30.9	34	33.9
220	35.9	38.7	38.7
221	35.8	38.6	38.5
222	35.8	38.6	38.5
223	29.2	31.4	31.2
224	31.8	34.9	34.8
225	35.7	38.5	38.4
226	35.3	38.2	38.1
227	39.5	42.1	42
228	31.2	34.3	34.1
229	26.2	29	28.8
230	36.3	39	38.9
231	40	42.2	42
232	37.6	40.2	40.1
233	35.7	38.5	38.3
234	37.1	39.7	39.5
235	33.2	35.7	35.5
236	28.3	31.1	31
237	38.1	40.5	40.3
238	32.7	35.7	35.5
239	32.4	35.4	35.2
240	36.6	39.2	39
241	32.4	35.3	35.2
242	31.9	34.8	34.7

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
243	34	36.6	36.4
244	34.4	36.9	36.7
245	33.3	35.9	35.8
246	35.1	37.4	37.3
247	29.1	31.9	31.7
248	36.3	38.6	38.4
249	35.5	37.7	37.5
250	28.7	31.4	31.3
251	35.5	37.7	37.5
252	35.3	37.6	37.4
253	35.3	37.5	37.3
254	32.4	34.9	34.8
255	34.6	36.9	36.7
256	32.1	34.4	34.2
257	31.9	34.2	34
258	25.1	27.7	27.5
259	28.7	31.4	31.3
260	28.7	31.5	31.3
261	33.9	36.1	35.9
262	24.1	26	25.8
263	31.3	33.6	33.4
264	32.5	34.8	34.6
265	23.9	25.8	25.6
266	27	29.1	28.9
267	23.9	25.8	25.6
268	23.7	25.6	25.4
269	30.6	32.9	32.7
270	23.7	25.6	25.4
271	24.2	26.7	26.5
272	30.5	32.7	32.5
273	23.6	25.6	25.4
274	25.9	27.9	27.7
275	24.8	27.4	27.2
276	28.5	30.7	30.4
277	29.7	32.2	32

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
278	28.9	31	30.8
279	25.8	27.8	27.6
280	25.5	28	27.8
281	25	27.5	27.4
282	25.4	28	27.8
283	25.7	28.2	28.1
284	30.3	32.4	32.2
285	25.8	28.3	28.2
286	26	28.5	28.3
287	30.1	32.2	32
288	25.3	27.8	27.6
289	26.6	29.1	29
290	25.9	28.5	28.3
291	25.1	27.6	27.4
292	26.4	28.9	28.7
293	25.1	27.6	27.5
294	28.5	30.9	30.7
295	24.7	26.7	26.5
296	28.6	31	30.8
297	27.7	30.1	29.9
298	26.4	28.8	28.7
299	25.7	28.2	28.1
300	23.8	25.8	25.6
301	29.7	31.9	31.7
302	27.6	30	29.9
303	24.9	26.8	26.6
304	26.8	28.8	28.6
305	27.6	29.9	29.7
306	25.7	28.1	28
307	27.5	29.9	29.7
308	26.5	28.9	28.8
309	26	28.4	28.2
310	26	28.4	28.2
311	26.3	28.4	28.1
312	27.8	29.9	29.7

Receptor ID	Predicted Noise Level (dB L _{A90}) at Standardised 10m Height Wind Speeds (m/s)		
	6	7	8
313	25.2	27.6	27.4
314	26	28.3	28.2
315	27.2	29.3	29.1
316	27.1	29.2	28.9
317	24.4	26.8	26.6
318	25.1	27.1	26.8
319	26.8	28.8	28.6
320	26.7	28.7	28.5
321	26.6	28.6	28.4
322	26.4	28.5	28.3
323	26.5	28.5	28.3
324	26.1	28.3	28.1
325	26.1	28.2	28.1
326	26.2	28.3	28.1
327	26	28.1	27.9
328	26.1	28.2	28
329	25.8	27.8	27.6
330	25.7	27.8	27.6
331	25.7	27.8	27.6
332	25.7	27.7	27.5
333	25.6	27.7	27.5
334	25.6	27.6	27.4
335	25.4	27.4	27.2
336	25.3	27.4	27.2
337	25.2	27.3	27.1
338	25.1	27.2	27



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