

WHITWORTH POWER

Noise Assessment

Prepared for: AMP Energy Services Ltd

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1.0 Introduction

AMP Energy Services Limited (AMP) has appointed SLR Consulting Limited (SLR) to undertake a noise compliance assessment for the gas fired power plant at Whitworth Street, Manchester, M11 2NE, herein referred to as 'the Site'. The assessment is required to discharge Condition 6 of the application Site decision notice (Ref: 122250/FO/2018). Condition 6 is reproduced below:

"Noise from the operation of the development including any externally mounted equipment shall not exceed the levels specified in the SLR Consulting Noise Impact Assessment report reference: 404.08071.00001 Version No:1 dated January 2019 as approved by the City Council as local planning authority. Prior to occupation of the development post-completion testing shall be undertaken and a verification report submitted to the LPA for written approval. The verification report shall validate that the development conforms to the predicted noise levels contained in the approved Noise Impact Assessment. Any instances of non-conformity shall be detailed along with measures required to ensure compliance with the approved noise levels and any agreed measures shall be implemented prior to occupation of the development."

This Report is structured as follows:

- Guidance: Whilst the condition does not reference BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS4142) the specific sound levels presented in the report quoted in condition 6 '404.08071.00001 Version No:1 dated January 2019' herein referred to as the 'SLR Report' were calculated in accordance with BS4142. An introduction to the standard is provided;
- Site Description and Assumed Operational Noise Limits;
- Noise Survey;
- Assessment of Compliance; and
- Conclusion.

Whilst reasonable effort has been made to ensure that this report is easy to understand, it is technical in nature; to assist the reader, a glossary of terminology is included in Appendix 01.

2.0 Assessment Guidance

2.1 British Standard 4142:2014+A1:2019

British Standard 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS4142) is intended to be used to assess the potential adverse impact of sound, of an industrial and/or commercial nature, at nearby noise-sensitive receptor locations within the context of the existing sound environment.

Where the specific sound contains tonality, impulsivity and/or other sound characteristics, penalties should be applied depending on the perceptibility. For tonality a correction of either 0, 2, 4 or 6 dB should be added and for impulsivity a correction of either 0, 3, 6 or 9 dB should be added. If the sound contains specific sound features which are neither tonal nor impulsive, a penalty of 3 dB should be added.

In addition, if the sound contains identifiable operational and non-operational periods, that are readily distinguishable against the existing sound environment, a further penalty of 3 dB may be applied.

The assessment of impact contained in BS4142 is undertaken by comparing the sound rating level, i.e. the specific sound level of the source plus any penalties, to the measured representative background sound level

immediately outside the noise-sensitive receptor location. Consideration is then given to the context of the existing sound environment at the noise-sensitive receptor location to assess the potential impact.

Once an initial estimate of the impact is determined, by subtracting the measured background sound level from the rating sound level, BS4142 states that the following should be considered:

- typically, the greater the difference, the greater the magnitude of the impact;
- a difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- a difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
- the lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. It is an indication that the specific sound source has a low impact, depending on the context.

BS4142 notes that:

“Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.”

BS4142 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

To account for the acoustic character of proposed sound sources, BS4142 provides the following with respect to the application of penalties to account for *“the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention”*.

- **Tonality** – *“For sound ranging from not tonal to predominantly tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible;*
- **Impulsivity** – *A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible;*
- **Intermittency** – *When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied; and*
- **Other Sound Characteristics** – *Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.”*

Finally, BS4142 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

3.0 Site Description and Operational Noise Limits

3.1 Site Description

The Site is situated on a parcel of land off Whitworth Street, Manchester.

The Site itself consists of 2 no. gas engines and is shown in Figure 3-1.

Figure 3-1
Site Location



3.2 Operational Noise Limits

The predicted noise levels in the SLR Report are shown in Table 3-1. It is understood that the quoted specific noise levels are the approved noise limits from the Site at each Receptor.

Night time noise levels at the St Francis Primary School have not been predicted on the basis that this receptor is not noise sensitive during the night time.

Table 3-1
Predicted Sound Levels of Two Engines, free-field dB

Location	Period	Predicted Sound Level, $L_{Aeq,T}$
Ashton Old Road	Daytime	36.1
	Night-Time	35.4
St Francis Primary School	Daytime	28.9
	Night-Time	-
Brinsop Square	Daytime	28.0
	Night-Time	29.2

The predicted noise levels are shown graphically in Figures 2-2 (daytime) and 2-3 (night-time).

Figure 3-2
Daytime Specific Sound Levels

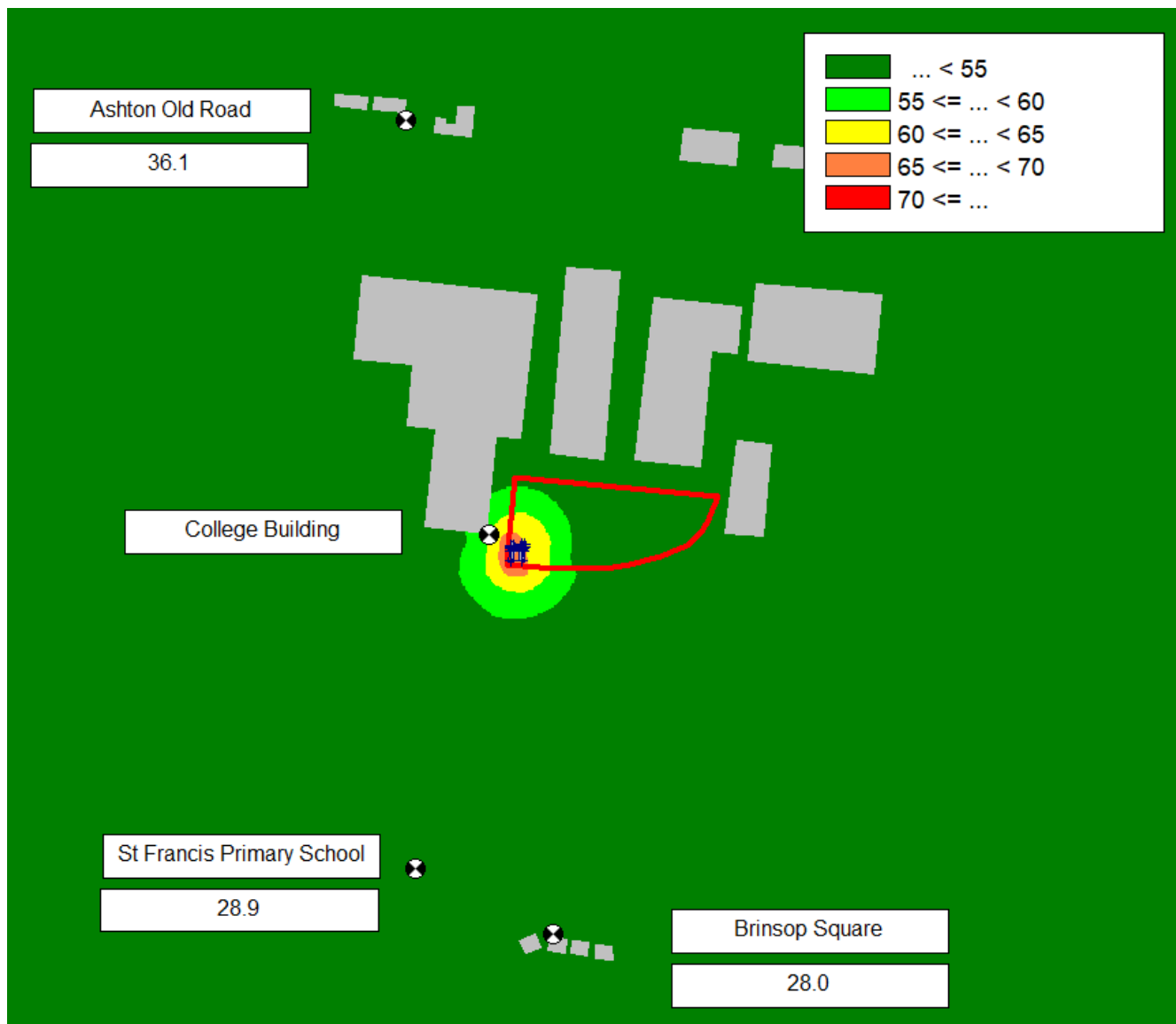


Figure 3-3
Night-Time Specific Sound Levels



4.0 Noise Survey

A noise survey was completed on Thursday the 6th of January and Friday the 7th of January 2022.

4.1 Weather Conditions

During the survey the weather conditions were considered adequate for ascertaining the specific noise level of the Site. The weather report for the local area is presented in Figure 4-1.

Figure 4-1
Weather Screenshot

Today at								Friday at		
16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	00:00	01:00	02:00
Chance of precipitation										
50%	10%	10%	10%	10%	10%	10%	10%	20%	20%	30%
Temperature °C										
5°	5°	5°	6°	5°	4°	4°	4°	4°	3°	3°
Feels like temperature (°C)										
0°	1°	2°	2°	2°	1°	1°	0°	0°	-1°	-1°
Wind direction and speed mph										
↙ SSW 15	↙ SSW 14	↙ SSW 12	↙ SW 11	↙ SW 10	↙ SW 9	↙ SW 10	↙ SW 11	↙ SW 11	↙ SW 12	↙ SW 11
Wind gust (mph)										
35	32	28	27	24	21	23	23	22	24	23
Visibility description										
G	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG
Humidity										
90%	92%	90%	83%	83%	84%	82%	84%	82%	81%	82%

4.2 Equipment

The monitoring equipment used during the survey is detailed in Table 4-1. All measurement instrumentation was calibrated before and after the measurements. The calibration chain is traceable via the United Kingdom Accreditation Service to National Standards held at the National Physical Laboratory. No significant drift was observed.

Table 4-1
Survey Equipment

Location	Equipment	Serial Number /s
Ashton Old Road	Rion NL-52 Type 1 Sound Level Meters	710361, and 710362
	Rion NC-74 Acoustic Calibrator	34336013
Brinsop Square (representative location)	Rion NL-52 Type 1 Sound Level Meters	710361, and 710362
	Rion NC-74 Acoustic Calibrator	34336013
Site Boundary	Rion NL-52 Type 1 Sound Level Meter	331823
	Rion NC-74 Acoustic Calibrator	34336013

4.3 Monitoring Protocol

At the monitoring locations the microphone was placed at 1.5 m and 4 m above the ground in free-field conditions, i.e. at least 3.5 m from the nearest vertical, reflecting surface, with the following noise level indices being logged every 1-minute:

- $L_{Aeq,T}$: The A-weighted equivalent continuous noise level over the measurement period, T .
- $L_{eq,T}$: The linear equivalent continuous noise level over the measurement period.
- L_{A90} : The A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe background noise.
- L_{A10} : The A-weighted noise level exceeded for 10% of the measurement period. This parameter is often used to describe road traffic noise.
- L_{Amax} : The maximum A-weighted noise level during the measurement period

4.4 Monitoring Locations

Noise levels were measured at the following locations:

- Ashton Old Road;
- Brinsop Square (representative location); and
- Site Boundary.

The monitoring locations described above are shown on Figure 4-2 below.

Figure 4-2
Monitoring Locations



At each location noise levels were measured as follows:

- Non-Operational noise levels were measured:
 - between 23:30 and 00:00 at Ashton Old Road.
 - between 00:45 and 01:15 at Brinsop Square (representative location).
 - Both the above periods at the Site Boundary location.
- Operational noise levels were measured as follows:
 - between 00:00 and 00:30 at Ashton Old Road.
 - between 01:15 and 01:45 at Brinsop Square (representative location).
 - Both the above periods at the Site Boundary location.

4.5 Survey Results

The measured ambient, background, and maximum noise survey results from the survey are shown in Table 4-2 below. The full survey results can be seen in Appendix 02 of this Report.

Table 4-2
Summary of Measured Noise Levels

Receptor	Plant Status	Microphone Height, m	$L_{Aeq,T}$	L_{A90}	L_{Amax}
Ashton Old Road	Non-operational	1.5	61.7	49.2	77.4
		4.0	63.4	51.6	78.9
	Operational	1.5	61.7	48.1	80.9
		4.0	63.4	50.0	80.9
Brinsop Square (representative location)	Non-operational	1.5	46.0	41.6	75.8
		4.0	46.0	42.2	74.6
	Operational	1.5	42.7	40.5	62.6
		4.0	43.3	41.0	60.1
Site Boundary	Non-operational	1.5	49.0	43.3	76.1
	Operational	1.5	59.9	59.9	61.6

4.6 Soundscape

4.6.1 Location 1

At Location 1 the soundscape consisted of road traffic noise on Ashton Old Road and distant train noise. At the time that the Engines were turned on (00:00), there was no discernible difference in the noise climate.

4.6.2 Location 2

At Location 2 the soundscape consisted of distant road traffic noise. At the time that the Engines were turned on (01:15), there was no discernible difference in the noise climate.

5.0 Assessment of Compliance

5.1 Measurement

To undertake the assessment of compliance the specific sound level from the Site at the receptor location needs to be determined.

This level is calculated by logarithmically subtracting the measured non-operational L_{Aeq} level (residual level) from the measured operational L_{Aeq} level as shown below.

- Specific sound level from the Site = $10 \log_{10} ((10^{L_{Aeq \text{ operational}/10}}) - (10^{L_{Aeq \text{ non-operational}/10}))$

Table 5-1
Calculated Specific Noise Level dB

Location	Height (m)	L_{Aeq} Operational	L_{Aeq} Non-Operational	L_{Aeq} Specific Sound Level
Ashton Old Road	1.5	61.7	61.7	-
	4.0	63.4	63.4	-
Brinsnop Square (representative location)	1.5	42.7	49.5	-
	4.0	43.3	49.1	-

It can be seen from Table 5-1 that it is not possible to determine the specific sound of the Site at the residential locations from measurement alone as the operation of the Site did not elevate the measured ambient noise levels. This supports the soundscape observations made in Section 4.6 that when the Engines were turned on there was no discernible change in the noise climate.

As it has not been possible to determine the specific sound level of the Engines from measurement alone, Section 5.2 presents a calculation of the Engine noise based upon the measurements made at the Site Boundary.

5.2 Calculation

It can be seen from Table 4-2 that at the Site Boundary (at a position approximately 38 m from the nearest Engine), when the engines were operational the measured ambient sound level increased by 10.9 dB(A). The specific sound level of the engines at the measurement position, with the baseline ambient removed, equates to 59.5 dB(A).

Using the following equation, the sound power level of the Site can be calculated:

- $20 \times \log_{10} (\text{Distance between source and measurement position}) + 8$

The resultant sound power level of the Site equals 99.1 dB(A).

5.2.1 Geometric Divergence

Using the following equation¹, the sound reduction due to geometric divergence at Ashton Old Road, and at Brinsop Square, can be calculated:

- Equation: $99.1 \text{ dB(A)} - ((20 \times \text{Log}_{10} (\text{Distance between source and receptor}) + 8))$

Ashton Old Road is approximately 260 m from the Site, whilst Brinsop Square is approximately 230 m from the Site.

Using the equation, the sound reduction due to geometric convergence is as follows:

- Ashton Old Road Receptor: 56.2 dB(A).
- Brinsop Square Receptor: 43.8 dB(A).

5.2.2 Atmospheric Absorption

Using the following equation, the specific sound level at Ashton Old Road, and at Brinsop Square, can be corrected to account for atmospheric absorption²:

- $(1.9 \times \text{Distance between source and receptor}) / 1000$

Ashton Old Road is approximately 260 m from the Site, whilst Brinsop Square is approximately 230 m from the Site.

Using the equation, the sound reduction due to geometric convergence is as follows:

- Ashton Old Road Receptor: 4.9 dB(A).
- Brinsop Square Receptor: 4.4 dB(A).

¹ ISO 9613-2 Equation 7. Assuming hemispherical radiation.

² ISO 9613-2 Equation 8. Assumes atmospheric attenuation coefficient of 1.9 (the lowest 500Hz value, used as A-weighted data has been provided).

5.2.3 Ground Effect

Using the following equation, the specific sound level at Ashton Old Road, and at Brinsop Square, can be corrected to account for ground effect³.

- $4.8 - (2 \times 4^4 / \text{Distance between source and receptor}) (17 + (300 / \text{Distance between source and receptor}))$

Ashton Old Road is approximately 260 m from the Site, whilst Brinsop Square is approximately 230 m from the Site.

Using the equation, the sound reduction due to ground effect is as follows:

- Ashton Old Road Receptor: 3.7 dB(A).
- Brinsop Square Receptor: 3.5 dB(A).

5.2.4 Screening

To account for screening of noise between the Site and the nearest NSR a correction of 10 dB(A)⁵ has then been applied.

5.2.5 Calculated Specific Sound Level

Considering geometric convergence, atmospheric absorption, ground effect, and screening, the resultant specific sound level at each Receptor, based on the measured noise level at the boundary location is as follows:

- Ashton Old Road Receptor: 34.3 dB(A).
- Brinsop Square Receptor: 37.4 dB(A).

³ ISO 9613-2 Equation 10. Assumes soft / porous ground.

⁴ This value is the mean height of propagation above ground. 4m has been chosen as the source height and receptor heights are expected to be no higher.

⁵ See Page 130 of BS5228:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*.

6.0 Discussion and Conclusion

6.1.1 Ashton Old Road

The calculated specific sound level of 34.3 dB(A) is within 1.8 dB(A) of the highest specific sound level modelled within the SLR Report.

During the non-operational survey at Ashton Old Road the baseline ambient noise level was 61.7 dB(A) and 63.4 dB(A). An Engine specific sound level of 34.3 dB(A) would not be audible above a baseline ambient noise level and would not increase the ambient sound level. This supports the soundscape observations made in Section 4.6 that when the Engines were turned on there was no discernible change in the noise climate.

With reference to Condition 6 of application Site decision notice (122250/FO/2018), the Site is compliant.

6.1.2 Brinsop Square

The calculated specific sound level of 37.4 dB(A) is 9.4 dB(A) higher than the lowest specific sound level modelled within the SLR Report. However, when the Engines were turned on there was no discernible change in the noise climate. If the specific sound level was as high as 37.4 dB(A) it would be expected that this would have been heard by the surveyor.

Furthermore, a specific sound level of 37.4 dB(A) logarithmically added to a baseline ambient sound level of 46.0 dB(A) would increase the overall ambient sound level to 46.6 dB(A). However, during the operational survey the measured ambient sound level fell to 43.3 dB(A) and 42.7 dB(A) respectively.

To conclude, SLR consider that with reference to Condition 6 of application Site decision notice (122250/FO/2018), the Site is compliant as the Engines were not audible at the locations representative of Brinsop Square.

APPENDIX 01

Glossary of Terminology

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table 01-1
Sound Levels Commonly Found in the Environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	Threshold of Pain

Acoustic Terminology

dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure ($2 \times 10^{-5} \text{Pa}$).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
L_{Aeq}	L_{Aeq} is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L_{90}	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for $n\%$ of the time. Hence, L_{90} is the 'average minimum level' and is often used to describe the background noise.
L_{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

APPENDIX 02

Survey Results

Table 02-01
Ashton Old Road Measurements at 1.5 m

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
06/01/2022 23:30	60.4	49.9	65.0	68.7
06/01/2022 23:31	61.9	50.8	67.3	74.3
06/01/2022 23:32	57.5	48.6	62.3	67.1
06/01/2022 23:33	61.2	48.4	65.8	74.3
06/01/2022 23:34	60.4	50.8	64.5	71.2
06/01/2022 23:35	65.7	50.4	70.6	76.1
06/01/2022 23:36	59.1	47.7	63.9	71.7
06/01/2022 23:37	58.3	49.6	62.2	67.5
06/01/2022 23:38	61.9	48.4	66.6	73.1
06/01/2022 23:39	62.3	51.6	67.8	72.7
06/01/2022 23:40	54.3	47.2	58.8	64.8
06/01/2022 23:41	61.4	49.0	66.3	70.7
06/01/2022 23:42	63.9	50.9	68.0	73.7
06/01/2022 23:43	58.6	47.4	61.0	72.3
06/01/2022 23:44	60.9	45.8	65.2	70.7
06/01/2022 23:45	62.2	46.7	67.9	74.7
06/01/2022 23:46	65.7	55.5	69.8	74.9
06/01/2022 23:47	61.7	49.4	66.8	72.8
06/01/2022 23:48	59.0	48.9	63.8	71.8
06/01/2022 23:49	55.4	45.7	56.8	69.3
06/01/2022 23:50	65.9	52.2	70.4	75.4
06/01/2022 23:51	61.0	50.1	65.1	69.1
06/01/2022 23:52	52.6	46.1	53.1	67.2
06/01/2022 23:53	65.0	54.0	68.3	72.2
06/01/2022 23:54	60.9	48.2	65.2	71.0
06/01/2022 23:55	59.8	49.5	62.1	72.3
06/01/2022 23:56	58.5	46.4	60.6	73.0
06/01/2022 23:57	62.0	48.4	66.6	72.7
06/01/2022 23:58	63.8	52.2	67.7	77.4
06/01/2022 23:59	57.0	51.0	60.4	65.4
07/01/2022 00:00	60.1	47.4	65.2	72.1
07/01/2022 00:01	63.8	49.9	66.3	78.4

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
07/01/2022 00:02	58.4	47.4	63.5	69.8
07/01/2022 00:03	61.5	47.9	63.2	77.2
07/01/2022 00:04	62.2	46.8	68.1	70.8
07/01/2022 00:05	62.1	53.4	66.2	71.2
07/01/2022 00:06	64.9	50.3	69.9	74.9
07/01/2022 00:07	63.4	50.3	69.0	74.7
07/01/2022 00:08	63.6	53.2	68.0	72.6
07/01/2022 00:09	66.0	54.1	67.8	79.5
07/01/2022 00:10	62.4	50.7	67.4	73.8
07/01/2022 00:11	60.4	49.1	65.5	70.0
07/01/2022 00:12	50.4	46.4	54.6	60.1
07/01/2022 00:13	60.0	46.8	65.8	72.7
07/01/2022 00:14	58.1	46.0	63.0	70.0
07/01/2022 00:15	56.7	47.0	61.5	65.5
07/01/2022 00:16	59.3	47.3	63.0	71.8
07/01/2022 00:17	55.6	48.5	60.7	65.8
07/01/2022 00:18	62.2	49.2	66.4	74.8
07/01/2022 00:19	60.7	48.7	65.5	70.6
07/01/2022 00:20	59.6	48.3	64.4	73.7
07/01/2022 00:21	64.5	51.9	67.8	77.3
07/01/2022 00:22	64.1	50.6	69.1	73.0
07/01/2022 00:23	66.0	51.0	68.6	80.9
07/01/2022 00:24	57.5	45.8	56.7	73.6
07/01/2022 00:25	58.8	47.4	64.5	71.8
07/01/2022 00:26	61.2	47.5	65.9	69.9
07/01/2022 00:27	62.9	47.7	68.7	73.8
07/01/2022 00:28	57.7	45.5	59.2	71.6
07/01/2022 00:29	56.1	44.9	62.6	66.7

Table 02-02
Ashton Old Road Measurements at 1.5m

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
06/01/2022 23:30	62.5	52.0	66.8	70.2

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
06/01/2022 23:31	63.9	53.6	69.1	75.3
06/01/2022 23:32	59.0	49.4	63.6	68.2
06/01/2022 23:33	62.6	49.1	66.9	73.9
06/01/2022 23:34	62.3	53.3	66.5	71.5
06/01/2022 23:35	67.3	52.8	72.4	76.9
06/01/2022 23:36	60.9	49.4	65.8	72.6
06/01/2022 23:37	60.1	51.4	63.8	67.8
06/01/2022 23:38	63.9	50.1	68.6	74.6
06/01/2022 23:39	64.2	54.7	69.8	73.2
06/01/2022 23:40	56.5	48.8	61.0	66.4
06/01/2022 23:41	63.2	52.4	67.9	71.9
06/01/2022 23:42	65.6	54.1	69.4	75.0
06/01/2022 23:43	60.3	49.8	63.4	73.7
06/01/2022 23:44	62.4	46.8	66.4	71.3
06/01/2022 23:45	64.2	48.4	69.8	76.9
06/01/2022 23:46	67.1	56.9	71.0	77.2
06/01/2022 23:47	63.4	51.8	67.7	73.8
06/01/2022 23:48	61.3	51.2	66.6	72.7
06/01/2022 23:49	55.7	46.6	57.0	69.7
06/01/2022 23:50	67.6	55.0	72.2	76.2
06/01/2022 23:51	63.0	52.5	67.2	70.7
06/01/2022 23:52	53.9	47.4	55.2	67.4
06/01/2022 23:53	66.9	55.1	70.1	73.6
06/01/2022 23:54	62.6	49.2	67.0	71.0
06/01/2022 23:55	61.9	52.7	65.1	75.7
06/01/2022 23:56	60.1	47.6	62.7	74.5
06/01/2022 23:57	63.9	50.0	68.7	73.9
06/01/2022 23:58	64.9	53.8	68.0	78.9
06/01/2022 23:59	58.3	52.8	62.2	66.3
07/01/2022 00:00	61.5	48.4	67.4	73.2
07/01/2022 00:01	64.2	51.3	67.2	77.6
07/01/2022 00:02	59.6	49.1	64.1	69.5
07/01/2022 00:03	63.2	49.0	65.8	76.8
07/01/2022 00:04	63.9	47.5	69.6	72.5
07/01/2022 00:05	63.8	55.2	67.9	71.8

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
07/01/2022 00:06	66.5	52.1	71.7	75.2
07/01/2022 00:07	64.9	52.6	70.6	74.5
07/01/2022 00:08	65.6	56.2	69.4	74.6
07/01/2022 00:09	67.5	56.5	69.3	80.5
07/01/2022 00:10	64.1	53.3	68.4	74.2
07/01/2022 00:11	62.3	51.1	67.1	72.5
07/01/2022 00:12	53.0	47.5	57.2	64.1
07/01/2022 00:13	61.9	47.4	68.1	74.0
07/01/2022 00:14	59.7	47.0	64.2	70.8
07/01/2022 00:15	58.5	47.8	63.4	66.2
07/01/2022 00:16	61.3	48.7	65.4	73.8
07/01/2022 00:17	57.4	50.1	62.2	66.8
07/01/2022 00:18	64.3	51.4	68.6	76.4
07/01/2022 00:19	62.5	50.8	66.8	71.1
07/01/2022 00:20	61.2	49.9	66.1	74.2
07/01/2022 00:21	66.1	54.3	69.5	77.2
07/01/2022 00:22	66.1	52.6	70.5	76.4
07/01/2022 00:23	66.6	53.4	69.7	80.9
07/01/2022 00:24	59.0	46.4	59.2	74.4
07/01/2022 00:25	60.6	48.0	66.4	72.7
07/01/2022 00:26	63.2	49.0	67.2	72.2
07/01/2022 00:27	64.8	51.3	70.7	75.9
07/01/2022 00:28	59.6	46.2	62.8	73.8
07/01/2022 00:29	58.2	45.7	64.5	68.3

Table 02-03
Brinsnop Measurements at 1.5m

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
07/01/2022 00:45	45.1	42.0	47.0	52.2
07/01/2022 00:46	42.9	41.9	44.1	45.5
07/01/2022 00:47	44.1	41.8	45.8	48.6
07/01/2022 00:48	43.7	42.6	44.6	47.4
07/01/2022 00:49	56.9*	44.1	61.7	68.0
07/01/2022 00:50	59.7*	42.6	61.8	75.8
07/01/2022 00:51	42.6	40.8	44.2	47.5

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
07/01/2022 00:52	42.9	41.6	44.5	46.4
07/01/2022 00:53	47.3	41.7	51.2	58.7
07/01/2022 00:54	56.4*	42.6	59.5	71.7
07/01/2022 00:55	48.7	45.1	51.8	56.2
07/01/2022 00:56	42.8	40.7	44.1	46.5
07/01/2022 00:57	43.2	41.3	44.2	46.2
07/01/2022 00:58	43.6	41.9	45.1	48.1
07/01/2022 00:59	45.2	43.6	46.7	48.2
07/01/2022 01:00	43.5	42.1	45.0	46.8
07/01/2022 01:01	43.6	41.9	45.0	51.1
07/01/2022 01:02	42.6	41.3	44.0	45.3
07/01/2022 01:03	43.4	41.8	45.0	47.4
07/01/2022 01:04	44.7	41.5	46.3	49.9
07/01/2022 01:05	42.7	40.7	44.1	45.8
07/01/2022 01:06	42.1	41.0	43.3	45.5
07/01/2022 01:07	42.6	41.4	43.7	45.4
07/01/2022 01:08	41.8	40.3	43.0	44.9
07/01/2022 01:09	41.8	41.0	42.7	44.3
07/01/2022 01:10	42.1	40.7	43.5	45.8
07/01/2022 01:11	41.7	40.0	43.2	44.0
07/01/2022 01:12	44.0	40.8	46.2	53.0
07/01/2022 01:13	52.0	41.0	56.9	64.2
07/01/2022 01:14	42.0	39.7	42.7	49.9
07/01/2022 01:15	43.9	40.6	46.8	50.7
07/01/2022 01:16	42.6	41.2	44.2	47.1
07/01/2022 01:17	42.8	41.3	44.1	46.5
07/01/2022 01:18	43.0	40.7	44.4	46.4
07/01/2022 01:19	42.9	41.9	43.9	45.3
07/01/2022 01:20	46.3	42.7	48.2	54.7
07/01/2022 01:21	46.9	43.2	49.9	56.0
07/01/2022 01:22	43.1	41.3	44.9	46.5
07/01/2022 01:23	42.4	40.7	43.9	56.3
07/01/2022 01:24	42.9	40.4	42.2	62.6
07/01/2022 01:25	41.0	39.8	41.9	43.5
07/01/2022 01:26	42.8	41.5	44.4	47.8

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
07/01/2022 01:27	43.5	40.3	46.0	50.0
07/01/2022 01:28	43.9	40.5	47.1	52.2
07/01/2022 01:29	42.6	40.3	44.6	46.9
07/01/2022 01:30	43.4	41.4	45.4	49.1
07/01/2022 01:31	42.9	40.2	44.9	53.6
07/01/2022 01:32	40.8	39.0	41.9	46.8
07/01/2022 01:33	40.8	39.4	42.5	44.0
07/01/2022 01:34	41.5	40.1	42.6	44.9
07/01/2022 01:35	42.7	40.5	44.3	46.9
07/01/2022 01:36	40.4	39.4	41.3	43.2
07/01/2022 01:37	40.8	39.2	42.6	44.5
07/01/2022 01:38	41.2	40.2	42.0	44.0
07/01/2022 01:39	41.4	40.6	42.2	44.2
07/01/2022 01:40	42.6	41.5	43.4	44.8
07/01/2022 01:41	40.7	39.9	41.3	42.6
07/01/2022 01:42	40.3	39.6	41.1	42.3
07/01/2022 01:43	41.1	39.4	43.0	44.3
07/01/2022 01:44	41.6	39.0	43.7	51.1
07/01/2022 01:45	41.7	40.1	43.3	45.7
07/01/2022 01:46	42.3	41.1	43.2	49.4
07/01/2022 01:47	46.9	40.8	44.0	64.1

*Car Pass By removed from dataset

Table 02-04
Brinsnop Measurements at 4m

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
07/01/2022 00:45	45.8	42.7	47.6	53.5
07/01/2022 00:46	43.5	42.6	44.5	48.2
07/01/2022 00:47	45.0	42.5	47.0	50.0
07/01/2022 00:48	44.4	43.1	45.5	48.0
07/01/2022 00:49	55.6*	44.8	60.6	65.7
07/01/2022 00:50	59.3*	43.0	62.0	74.6
07/01/2022 00:51	43.3	41.4	44.8	47.8
07/01/2022 00:52	43.6	42.1	45.0	48.5

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
07/01/2022 00:53	46.0	42.3	49.2	55.0
07/01/2022 00:54	55.8*	43.3	59.2	70.6
07/01/2022 00:55	48.6	45.5	51.3	55.4
07/01/2022 00:56	43.4	41.5	44.5	47.8
07/01/2022 00:57	43.7	42.2	44.8	46.7
07/01/2022 00:58	44.0	42.1	45.5	47.3
07/01/2022 00:59	45.9	44.2	47.3	49.7
07/01/2022 01:00	44.2	42.9	45.4	47.0
07/01/2022 01:01	44.2	42.4	45.4	57.7
07/01/2022 01:02	43.6	42.1	44.9	47.1
07/01/2022 01:03	44.2	42.4	45.8	48.8
07/01/2022 01:04	45.7	43.2	47.9	50.5
07/01/2022 01:05	43.4	41.4	44.7	46.9
07/01/2022 01:06	43.0	41.5	44.1	46.4
07/01/2022 01:07	43.0	41.8	44.2	45.6
07/01/2022 01:08	42.5	40.9	43.4	45.6
07/01/2022 01:09	42.8	41.7	44.0	47.3
07/01/2022 01:10	43.0	41.4	44.6	46.2
07/01/2022 01:11	42.3	40.8	43.7	45.4
07/01/2022 01:12	44.7	41.6	47.1	54.1
07/01/2022 01:13	51.2	41.6	55.6	63.0
07/01/2022 01:14	42.2	40.3	43.5	48.1
07/01/2022 01:15	44.1	41.3	46.7	48.7
07/01/2022 01:16	43.4	41.7	44.8	47.3
07/01/2022 01:17	43.0	41.5	44.0	45.8
07/01/2022 01:18	43.5	41.0	45.0	47.5
07/01/2022 01:19	43.6	42.2	44.9	47.4
07/01/2022 01:20	47.3	43.9	49.2	58.3
07/01/2022 01:21	46.9	44.1	49.0	54.6
07/01/2022 01:22	43.6	42.1	45.2	46.2
07/01/2022 01:23	42.9	41.4	44.8	50.4
07/01/2022 01:24	42.6	41.0	42.5	60.1
07/01/2022 01:25	41.7	40.4	42.6	44.7
07/01/2022 01:26	43.1	42.2	43.8	45.8
07/01/2022 01:27	43.7	40.9	46.1	48.9

Start Time	$L_{Aeq,1min}$	$L_{A90,1min}$	$L_{A10,1min}$	L_{AFMax}
07/01/2022 01:28	44.6	41.0	47.9	52.0
07/01/2022 01:29	43.2	41.3	44.9	48.1
07/01/2022 01:30	43.9	41.9	45.6	47.9
07/01/2022 01:31	43.5	40.9	45.6	50.3
07/01/2022 01:32	41.4	39.6	42.8	48.5
07/01/2022 01:33	41.8	40.4	43.3	44.9
07/01/2022 01:34	42.2	40.8	43.4	44.3
07/01/2022 01:35	43.4	41.0	44.9	48.6
07/01/2022 01:36	41.2	40.1	42.1	44.4
07/01/2022 01:37	41.3	39.8	43.2	45.5
07/01/2022 01:38	41.8	40.8	43.0	44.9
07/01/2022 01:39	41.9	41.0	43.0	45.1
07/01/2022 01:40	43.2	42.0	44.3	45.7
07/01/2022 01:41	41.3	40.4	42.3	43.8
07/01/2022 01:42	41.1	40.3	42.0	43.1
07/01/2022 01:43	42.0	40.1	43.9	45.9
07/01/2022 01:44	42.6	39.5	45.3	52.5
07/01/2022 01:45	42.3	40.5	44.2	46.1
07/01/2022 01:46	43.1	41.8	44.3	49.1
07/01/2022 01:47	60.0	42.4	56.8	80.6
07/01/2022 01:48	48.3	41.9	49.9	63.0

- Car Pass By Removed from Dataset

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