TRUCK NOISE COMPLIANCE ASSESSMENT
THIRD QUARTER
VISY PULP AND PAPER PTY LIMITED
TUMUT

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BENBOW ENVIRONMENTAL

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Benbow
ENVIRONMENTAL

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1. INTRODUCTION

This report provides the details of the traffic noise assessment conducted for Visy Pulp and Paper as part of a Development Consent Condition 3.9. This is the third traffic noise assessment conducted.

The primary aims of this report are outlined as follows:

- Measure the existing road traffic noise at residential locations along the major transport routes;
- Undertake traffic logging to ascertain the contribution to traffic noise levels from the mill;
- Calculate the noise contribution provided by heavy vehicles related to Visy Pulp and Paper operations;
- Compare measured noise levels with relevant RTA and NSW Environment Protection Authority (NSW EPA) criteria; and
- Provide recommendations for possible noise reduction techniques, where necessary.

Existing traffic noise levels have been measured using noise data loggers at six (6) residential locations over a minimum period of seven (7) days. Noise logging could not be undertaken at location R6 as the resident was not at home during logger establishment.

Visy Pulp and Paper weight bridge records have been provided and utilised in combination with noise logger data in order to calculate the Visy-related traffic noise contribution.

2. ROAD TRAFFIC NOISE CRITERIA

The applicable criteria for Visy Pulp and Paper road traffic noise were outlined by Benbow Environmental in 2007 (report n. 17001_Truck Noise) as part of the noise impact assessment for the site's operations and related generation of road traffic noise.

The traffic noise criteria were referenced from the NSW EPA document "Environmental Criteria for Road Traffic Noise" (ECRTN) ISBN 0 7313 0203 6 EPA 99/3.

From 1 July 2011 the ECRTN was replaced by the "NSW Road Noise Policy", therefore calculations for road traffic noise have been carried out in accordance with the new policy.

The criteria examine two time periods (day and night) described by using the $L_{Aeq(period)}$ noise descriptor.

The applicable criteria are displayed below in Table 2-1 and explanation of the terminology is provided in Attachment 2.

Table 2-1: Road Traffic Noise Criteria

	Day (7:00am – 10:00pm)	Night (10:00pm – 7:00am)
$L_{Aeq\ (period)}$ [dB(A)]	$L_{Aeq\ (15\ hour)} = 60$	$L_{Aeq\ (9\ hour)} = 55$

Where the existing measured noise level is within 2dB of the above criterion, a 2dB allowance may be applied for the additional traffic. Where the existing measured noise level is already at the criteria and a further increase is predicted, then feasible and reasonable mitigation measures are needed.

Maximum noise levels generated at night time may result in sleep disturbance. There are guidelines provided for general reference in the Road Noise Policy document for maximum noise levels at the external façade of the residence.

The sleep disturbance assessment is more complex. The stationary industrial noise policy applied to sleep disturbance is readily exceeded by cars passing along roadways that have residences typically within 30m of the roadway and therefore cannot be effectively applied.

Trucks exceed this level further, so a voluntary management plan was presented in Attachment 3 of the 2007 Truck Noise report to reduce the L_{Amax} or $L_{A1\ (1\ min)}$ noise levels that may be experienced, as a part of best management practices.

3. ROAD NETWORK AND MONITORING LOCATIONS

All heavy vehicles entering and leaving the Visy Pulp and Paper site would drive along Snowy Mountains Highway either eastbound or westbound. Traffic counters were not considered in this assessment.

Several residences located along the Snowy Mountains Hwy, Batlow Rd, Wee Jasper Rd and Gocup Rd are potentially affected by road traffic noise.

Noise monitoring has been carried out at six (6) residential locations throughout, at least, a one week period utilizing type1 environmental noise loggers over 15 minute statistical intervals.

Table 3-1 presents the list of all monitored residential locations. The following figures below show an aerial view of all the considered locations.

Table 3-1: Noise Monitoring Residential Locations

Receiver	Address	Approx. distance from the road [m]
R1 – Brentwood	1518 Snowy Mountains Highway, Gadara, NSW	75
R2 – Glengarry	1393 Snowy Mountains Highway, Gadara, NSW	217
R3 – Beale	1006 Snowy Mountains Highway, Gadara, NSW	50
R4 – Batlow	379 Batlow Road (corner Gadara Ln), Gilmore, NSW	30
R5 – Wee Jasper	214 Wee Jasper Rd, Bombowlee	7
R6* – Gocup Rd	923 Gocup Rd, Minjary	28
R7 - Minjary	1575 Gocup Rd, Minjary	36

Note: * indicates that noise monitoring was not undertaken at this location.

Figure 3-1: Aerial View - Residences and Traffic Monitoring Locations

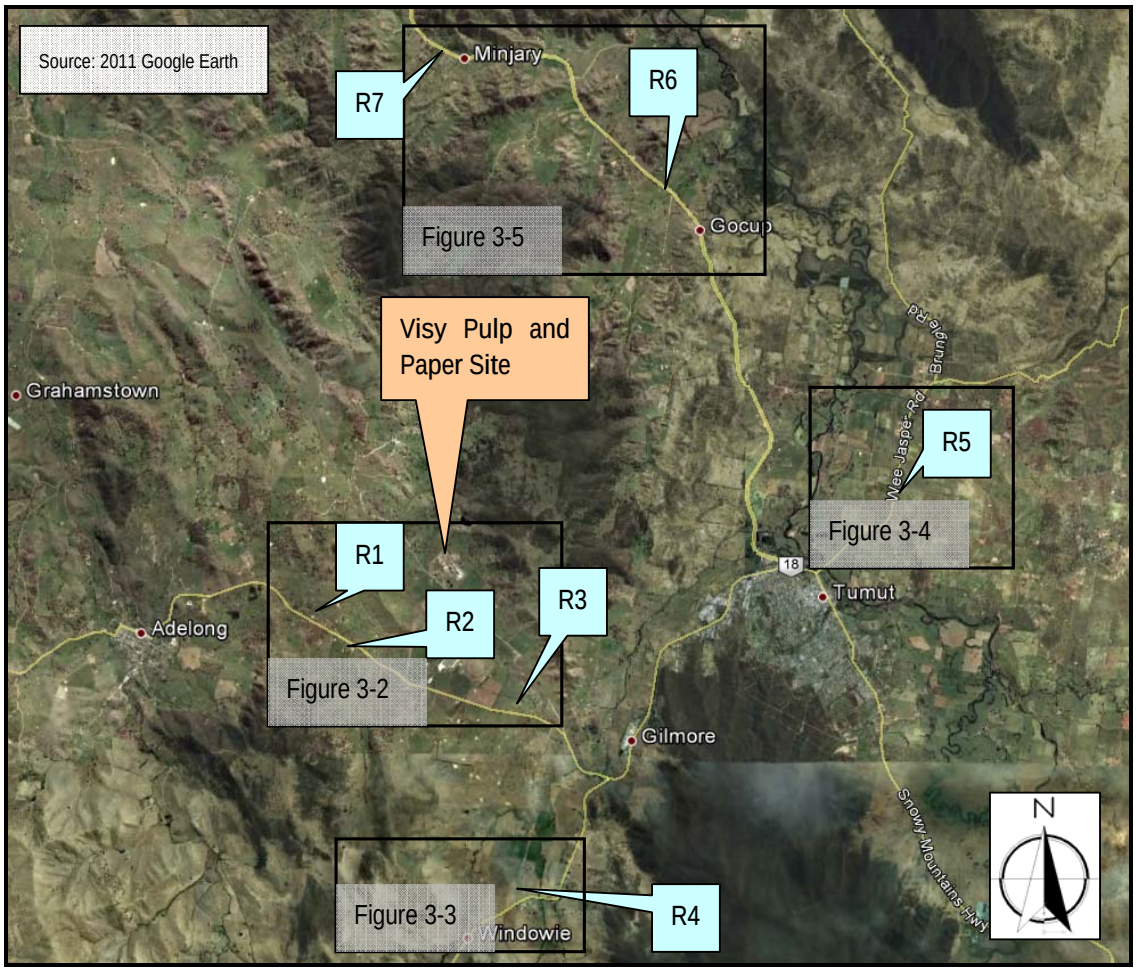


Figure 3-2: Snowy Mountain Hwy - Residences and Traffic Counter Locations

Figure 3-3: Batlow Rd - Residence Locations

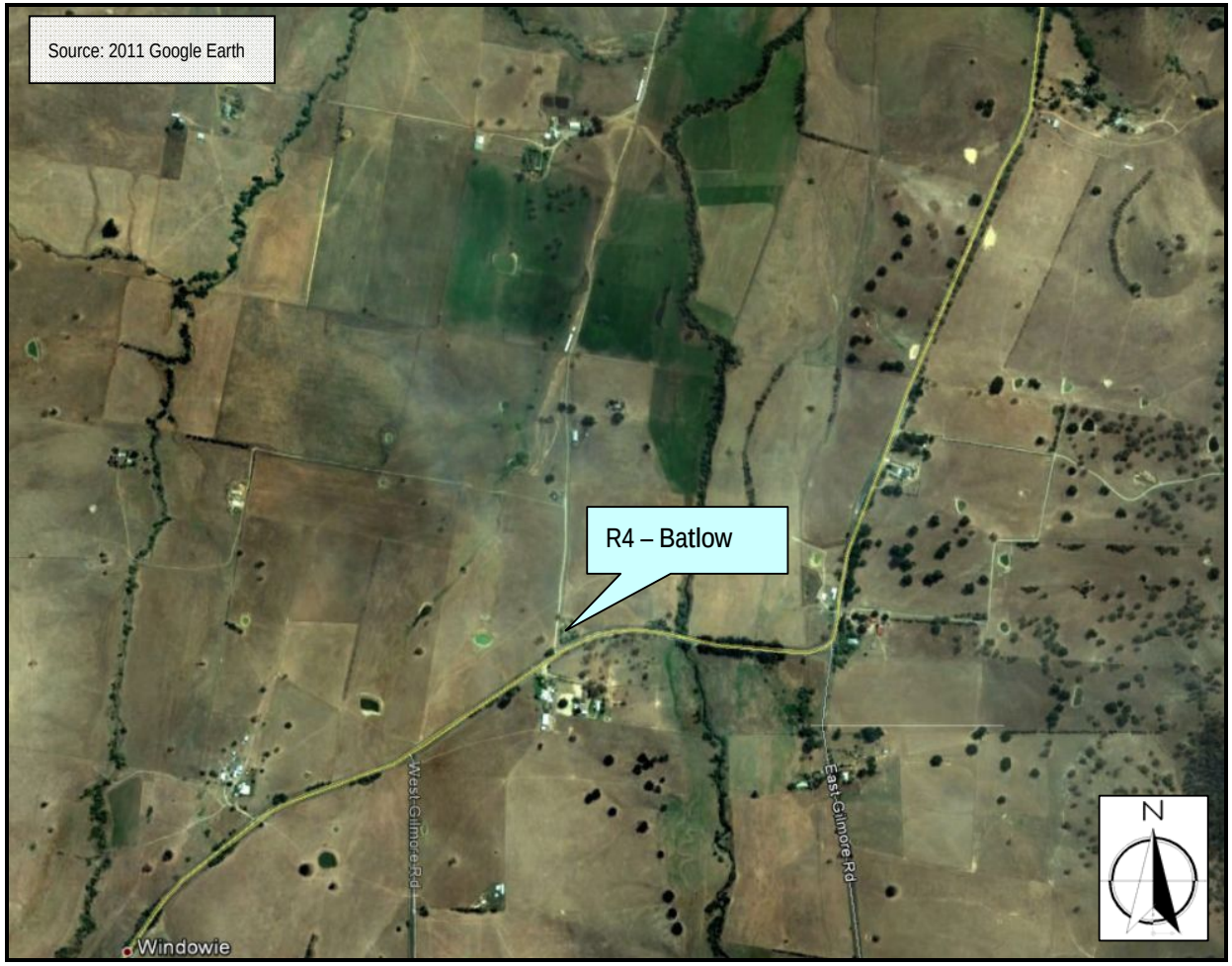


Figure 3-4: Wee Jasper - Residences and Traffic Counter Locations

Figure 3-5: Gocup Rd - Residence Locations

4. ROAD TRAFFIC NOISE LEVELS

4.1 METHODOLOGY

The unattended noise measurements were carried out using Acoustic Research Laboratories statistical Environmental Noise Loggers type Ngara and EL-215.

The instrument sets were calibrated by a NATA accredited laboratory within two years of the measurement period. The instrument sets comply with AS 1259. The instruments were set on A-weighted, fast response and logged noise levels over fifteen minute statistical intervals. Calibration Certificates have been included in the Attachments.

The microphones were positioned at 1.2 metres above ground level and were fitted with windsocks. To ensure accuracy and reliability in the results, field reference checks were applied both before and after the measurement period with an acoustic calibrator. There were no significant variances observed in the reference signal between the pre-measurement and post-measurement calibrations.

A discussion of the QA/QC procedures applied by Benbow Environmental (BE) in relation to sound level meters and the measurement of ambient noise levels has been included in the Attachments section of this report.

In assessing the background noise levels, any data affected by rain has been discarded. The weather data was sourced from Visy Weather Station on the Havilah property near the mill site.

4.2 EXISTING MEASURED TRAFFIC NOISE LEVELS

Noise levels have been monitored continuously for at least one (1) week between Wednesday 11th of April 2012 and Tuesday 1st May 2012 utilising environmental noise loggers measuring 15 minute statistical intervals. Daily noise logger graphs have been included in Attachments.

The $L_{Aeq\ (15\ hour)}$ and $L_{Aeq\ (9\ hour)}$ noise descriptors have been calculated accordingly with the EPA's *NSW Road Noise Policy (Appendix B3)* and the noise levels have been rounded to the nearest integer.

Noise loggers were located at six (6) of the seven (7) aforementioned residential locations in line with the front facades of the residences. The measured traffic noise levels are presented from Table 4-1 to Table 4-6. The daily logger graphs have been provided in the attachments.

Table 4-1: Measured Traffic Noise Levels at R1, dB(A)		
Date	$L_{Aeq(15\ hour)}$	$L_{Aeq(9\ hour)}$
11/04/2012	45	38
12/04/2012	49	42
13/04/2012	50	42
14/04/2012	49	43
15/04/2012	46	39
16/04/2012	52	45
17/04/2012	47	41
18/04/2012	50	44
19/04/2012	52	45
20/04/2012	54	40
21/04/2012	48	40
22/04/2012	48	39
23/04/2012	50	41
24/04/2012	54	45
25/04/2012	50	43
26/04/2012	48	42
27/04/2012	47	43
Logarithmic Average	50	42

Table 4-2: Measured Traffic Noise Levels at R2, dB(A)		
Date	$L_{Aeq(15\ hour)}$	$L_{Aeq(9\ hour)}$
11/04/2012	47	45
12/04/2012	46	45
13/04/2012	47	46
14/04/2012	48	42
15/04/2012	45	42
16/04/2012	51	44
17/04/2012	48	46
18/04/2012	51	45
19/04/2012	53	44
20/04/2012	45	42
21/04/2012	45	41
22/04/2012	45	41
23/04/2012	46	44
Logarithmic Average	**48**	**44**

Table 4-3: Measured Traffic Noise Levels at R3, dB(A)

Date	$L_{Aeq(15\ hour)}$	$L_{Aeq(9\ hour)}$
11/04/2012	56	55
12/04/2012	58	55
13/04/2012	56	55
14/04/2012	53	52
15/04/2012	53	50
16/04/2012	62	54
17/04/2012	56	54
18/04/2012	56	53
19/04/2012	57	52
20/04/2012	56	52
21/04/2012	54	51
22/04/2012	52	49
23/04/2012	58	53
24/04/2012	57	52
25/04/2012	53	49
26/04/2012	55	51
27/04/2012	56	53
28/04/2012	54	49
29/04/2012	52	49
30/04/2012	56	53
1/05/2012	56	55
Logarithmic Average	56	53

Table 4-4: Measured Traffic Noise Levels at R4, dB(A)

Date	$L_{Aeq(15\ hour)}$	$L_{Aeq(9\ hour)}$
11/04/2012	54	49
12/04/2012	56	54
13/04/2012	56	53
14/04/2012	52	49
15/04/2012	51	45
16/04/2012	56	53
17/04/2012	56	54
18/04/2012	56	52
19/04/2012	58	51
20/04/2012	58	52
21/04/2012	58	49
22/04/2012	54	48
23/04/2012	55	53
Logarithmic Average	56	52

Table 4-5: Measured Traffic Noise Levels at R5, dB(A)		
Date	$L_{Aeq(15\ hour)}$	$L_{Aeq(9\ hour)}$
12/04/2012	66	57
13/04/2012	66	63
14/04/2012	63	57
15/04/2012	62	52
16/04/2012	66	62
17/04/2012	66	63
18/04/2012	67	63
19/04/2012	67	62
20/04/2012	-	52
Logarithmic Average	66	61

Table 4-6: Measured Traffic Noise Levels at R7, dB(A)		
Date	$L_{Aeq(15\ hour)}$	$L_{Aeq(9\ hour)}$
12/04/2012	58	53
13/04/2012	58	54
14/04/2012	57	53
15/04/2012	58	53
16/04/2012	58	56
17/04/2012	59	55
18/04/2012	58	55
19/04/2012	58	55
20/04/2012	-	54
Logarithmic Average	58	54

4.3 SUMMARY OF MEASUREMENT RESULTS

The table below summarises the key noise monitoring results detailed within section 4.2 and states the status of compliance for all considered residential receiver locations.

Table 4-7: Summary of the Measured Traffic Noise Levels

Location	$L_{Aeq\ (15\ hour)}$ Criteria 60 dB(A)	$L_{Aeq\ (9\ hour)}$ Criteria 55 dB(A)	Compliance
R1 – Brentwood	50	42	Yes
R2 – Glengarry	48	44	Yes
R3 – Beale	56	53	Yes
R4 – Batlow	56	52	Yes
R5 – Wee Jasper	**66**	**61**	**No**
R6 – Gocup Rd	-	-	-
R7 – Minjary	58	54	Yes

Note: Cell in bold indicates that the level exceeds the noise criteria
- indicates that noise monitoring was not undertaken

Comments

The measured noise levels comply with the current noise criteria at receivers R1, R2, R3, R4 and R7. Compliance was not possible to determine at location R6 as noise monitoring was not undertaken at this location. Non-compliance has been recorded at location R5 throughout both the daytime and night time periods. An exceedance of six (6) dB was measured at this location for both time-periods.

It is important to mention that the unattended noise monitoring is influenced by extraneous noises such as wild life, people and traffic not related to Visy Pulp and Paper. Therefore, an additional analysis has been carried out for receiver R5 in order to determine if the noise exceedances at this location are attributable to Visy truck movements.

A comparison with the previous noise assessment carried out in November 2011 (110068_Truck Noise November 2011_Rev1) indicates that the noise levels have decreased for most of the receiver locations, with the exception of R3 (night-time), R5 night-time and R7 (day time) where noise readings remained the same. In addition, a minor increase of 1 dB was observed at receiver R5 for the day time period.

4.4 NOISE ANALYSIS AT RECEIVER R5

As the recorded noise levels are not only representative of noise generated by heavy vehicles but also include car movements and wildlife (e.g. birds and crickets), the traffic noise contribution from Visy-related trucks is expected to be lower than the actual L_{Aeq} measured.

Measured noise levels undertaken at locations R1, R2, R3, R4 and R7 achieved compliance including extraneous noise sources and therefore further analyses is considered unnecessary.

Visy Pulp and Paper provided Benbow Environmental with the following truck access data from the weight bridge:

- Entry Date and Time;
- Exit Date and Time;
- Access Route;
- Return Route;
- Weight (nett, gross, tare); and
- Supplier and transported product.

This information was utilized for determining the number of Visy truck movements travelling along Wee Jasper Road which represents the number of trucks passing by receiver R5.

Table 4-8 shows an example of the number of Visy trucks per hour on the 13th May 2012 travelling along Wee Jasper road and also shows the measured $L_{Aeq, 1\ hour}$ at Receiver R5.

Table 4-8: Visy Trucks Movements on 13th April 2012 Travelling Along Wee Jasper Road.

DATE	TIME	VISY TRUCKS IN	VISY TRUCKS OUT	TOTAL VISY TRUCKS	MEASURED L_{AEQ} 1 HOUR
13/04/2012	1:00	1	1	2	55
13/04/2012	2:00	0	0	0	54
13/04/2012	3:00	1	0	1	56
13/04/2012	4:00	0	2	2	58
13/04/2012	5:00	0	0	0	65
13/04/2012	6:00	0	0	0	65
13/04/2012	7:00	9	2	11	68
13/04/2012	8:00	0	6	6	66
13/04/2012	9:00	5	5	10	68
13/04/2012	10:00	5	6	11	66
13/04/2012	11:00	6	4	10	69
13/04/2012	12:00	3	5	8	67
13/04/2012	13:00	5	7	12	65
13/04/2012	14:00	5	2	7	65
13/04/2012	15:00	8	5	13	66
13/04/2012	16:00	3	9	12	65
13/04/2012	17:00	4	4	8	66
13/04/2012	18:00	1	2	3	65
13/04/2012	19:00	0	2	2	65
13/04/2012	20:00	3	0	3	62
13/04/2012	21:00	1	4	5	62
13/04/2012	22:00	1	1	2	58
13/04/2012	23:00	0	1	1	57
14/04/2012	0:00	1	0	1	58

Note: the time column indicates the final time of the considered hour period. E.g. 14:00 represents a time period between 13:00 and 14:00.

Comments

Table 4-8 above shows that between 4:00am and 6:00am the measured $L_{Aeq,\ 1\ hour}$ is 65 dB(A) when no Visy trucks travel along Wee Jasper Road. On the other hand the same 65 dB(A) noise levels were measured between 12:00pm to 13:00pm and 15:00pm to 16:00pm when 12 Visy trucks travelled along Wee Jasper Road per hour. Consequently, a greater number of Visy trucks does not strictly reflect a higher $L_{Aeq,\ 1\ hour}$ measured by the unattended noise monitoring. For instance, the noise level measured between 11:00am and 12:00pm considering 8 Visy trucks was 67 $L_{Aeq,\ 1\ hour}$; however, a level of 66 dB(A) was measured between 14:00pm to 15:00pm considering 13 trucks. All these observations allow one to conclude that Visy trucks may not be the main noise contributors at location R5 as numerous cars and trucks unrelated to Visy also travel along this road.

The CoRTN model (Calculation of Road Traffic Noise) algorithms are not valid for low traffic volumes and therefore are not suitable for this study.

Calculation of road traffic noise contribution from Visy trucks has been undertaken using a method that takes into account sound exposure levels and calculates the L_{Aeq} due to the time of exposure to the truck noise.

The following noise descriptors have been calculated:

- $L_{Aeq\ (15\ hour)}$; and
- $L_{Aeq\ (9\ hour)}$.

The method used to calculate sound exposure levels is explained below and is based on procedures referenced in AS 1055.1 and reference texts on assessing the environmental impact of roads and traffic.

AS 1055.1 Clause 3.6 defines L_{AE} as being:

> *"the sound exposure level of a discrete noise event is the instantaneous A-weighted sound pressure integrated over the specified time duration at the noise event and referenced to a duration of 1 sec".*

AS 1055.1 Clause 6.4.5 explains how the sound exposure level can be used:

> *"where a noise environment is the result of a number of identifiable noise events, the time weighted average A-weighted sound pressure level may be calculated from the sound exposure levels of the individual events occurring within a time period from the following equation:"*

$$L_{Aeq,T} = 10\log_{10}\frac{1}{T}\sum_{n=1}^{n}10^{0.1SEL}$$

The sound exposure level has been obtained from noise measurements carried out by Benbow Environmental during this assessment. The noise logger positioned at R5 was set up to measure audio files. This data was analyzed after logger retrieval and a representative SEL for Visy trucks was obtained.

The results of the truck noise calculations are shown in the following table:

Table 4-9: Calculated Visy Trucks Noise Contribution Levels at R5

Date	Visy Trucks Day	Visy Trucks Night	Estimated Visy Contribution $L_{Aeq(15\ hour)}$ Criteria 60 dB(A)	Estimated Visy Contribution $L_{Aeq(9\ hour)}$ Criteria 55 dB(A)	Compliance Day	Compliance Night
12/04/2012	124	15	59.8	52.9	Yes	Yes
13/04/2012	114	16	59.5	53.2	Yes	Yes
14/04/2012	38	15	54.7	52.9	Yes	Yes
15/04/2012	0	0	0	0	Yes	Yes
16/04/2012	93	12	58.6	51.9	Yes	Yes
17/04/2012	109	15	59.3	52.9	Yes	Yes
18/04/2012	103	21	59.0	54.3	Yes	Yes
19/04/2012	105	16	59.1	53.2	Yes	Yes
20/04/2012	111	12	59.4	51.9	Yes	Yes

Comments

Contribution from Visy trucks has been calculated to comply with the criteria for every day between and including the 12th April 2012 and 20th April 2012.

The western façade of this property is located approximately 7 m from the closest edge of the road. For this reason the trucks passing by at Wee Jasper Road are clearly audible at this location. Compliance with the criteria can be explained as trucks are considered to be intermittent noise events for durations below 30 seconds and although noise levels associated with trucks passing by significantly exceed 60 dB(A) and 55 dB(A) for day and night time respectively, the total noise contribution must be calculated over 15 hr and 9 hr respectively.

4.5 PHOTOGRAPHS

Figure 4-1: Unattended Measurements at Location R1

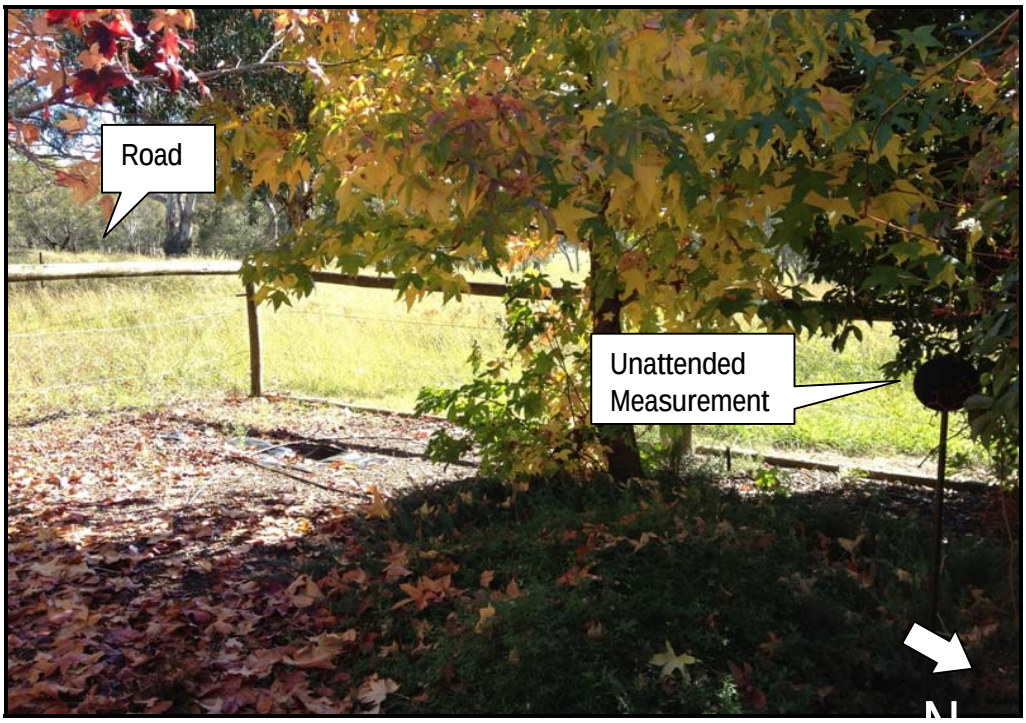


Figure 4-2: Unattended Measurements at Location R2

Figure 4-3: Unattended Measurements at Location R3

Figure 4-4: Unattended Measurements at Location R4

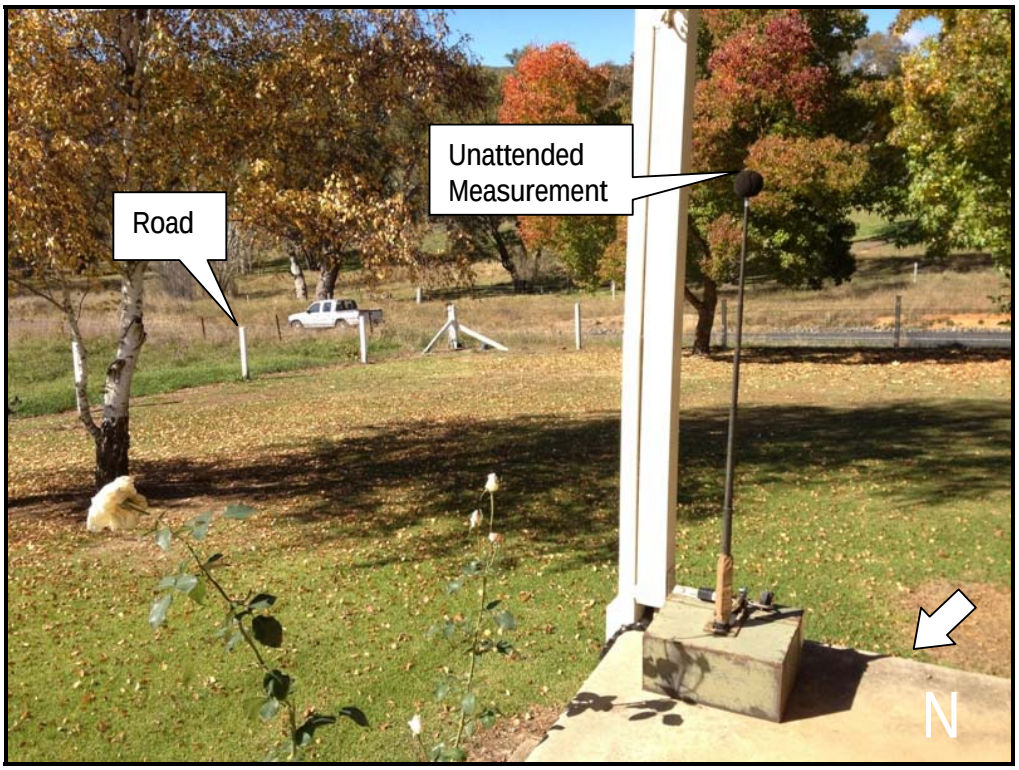
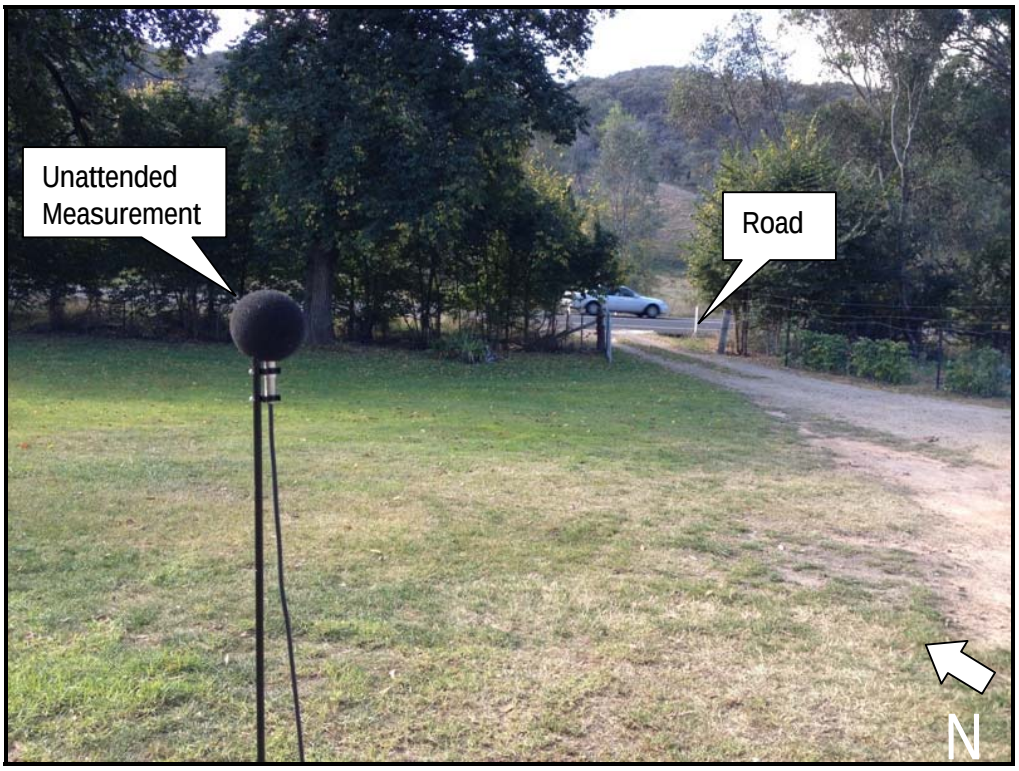


Figure 4-5: Unattended Measurements at Location R5

Figure 4-6: Unattended Measurements at Location R7



5. CONCLUSIONS

The traffic noise study was conducted at six (6) residential locations.

Unattended noise monitoring was not undertaken at location R6 as the resident was not at home during logger establishment.

Compliance is readily achieved for locations R1, R2, R3, R4 and R7.

Noise levels at location R5 were found to be higher than the noise limits even when there were no trucks from Visy passing through Wee Jasper Rd. Therefore, the traffic noise contribution from Visy at this receiver was calculated and found to comply with the traffic noise criteria.

Benbow Environmental recommends continued noise monitoring at all seven (7) receivers in order to assess compliance with the established noise criteria for off-site Visy trucks. Special attention should be considered at location R5 due to the close proximity between this location and Wee Jasper Rd.

The current impact of truck noise from Visy Pulp and Paper is not considered to be extensive or excessive.

This concludes the report.

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Acoustical Engineer	Acoustical Engineer	Principal Consultant

6. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use by Visy Pulp and Paper Pty Ltd, as per our agreement for providing environmental assessment services. Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that required by law) in relation to the information contained within this document.

Visy Pulp and Paper Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. No responsibility is accepted for the use of any part of the report in any other context or for any other purpose.

Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

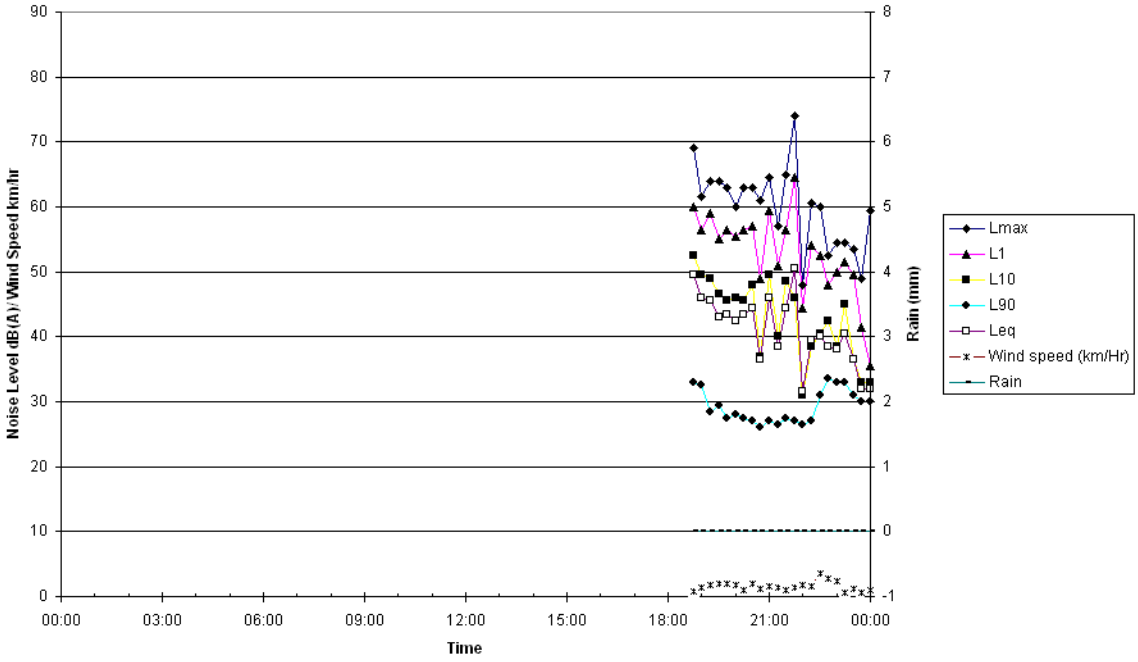
ATTACHMENTS

Terminology

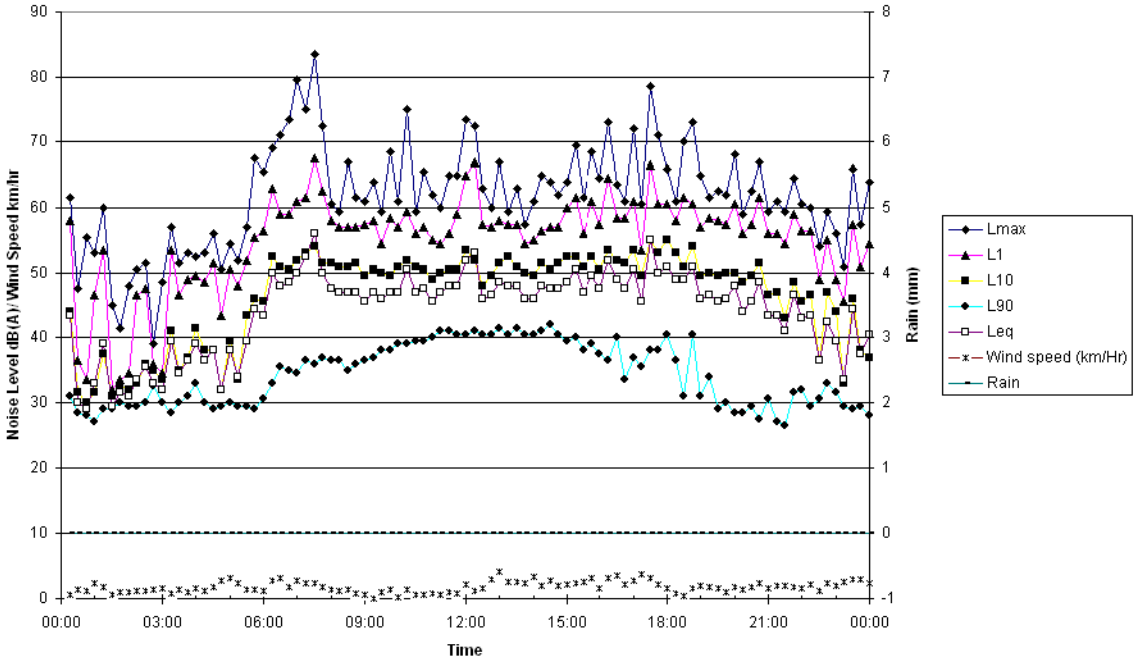
This section provides an explanation of the terms used throughout the report. In order to characterise the noise levels measured over a period of time the following noise descriptors are used:

- L_{A1}
  The L_{A1} is the level of noise exceeded for 1% of the time and is, therefore, the average peak level of noise experienced during the measurement period.
- L_{A10}
  The L_{A10} is the level of noise exceeded for 10% of the time and is, therefore, the maximum level of noise experienced during the measurement period.
- L_{Aeq}
  The L_{Aeq} is the equivalent continuous level of noise and is a single number that is equivalent to the fluctuations of noise level that are occurring based on the energy contained within the noise signal. The L_{Aeq} is determined by an integration of the noise level with respect to time.
- L_{A90}
  The L_{A90} is the level of noise exceeded for 90% of the sample time and is therefore the minimum level of noise experienced during the measurement period. The L_{A90} is referred to as the background noise level.
- Daytime and Night Time Periods
  For the criteria outlined in the NSW EPA Environmental Noise Control Manual, daytime is defined as from 7.00am to 10.00pm, Monday to Saturday, and 8am to 10pm on Sunday and Public Holidays. Night time is defined as 10pm to 7am, Monday to Friday, and 10pm to 8am on Sundays and Public Holidays.
- Sound Pressure Level (abbreviated SPL)
  Is the instantaneous measurement of pressure variations in the ambient air compared to a reference pressure. A precision sound level meter measures SPL and measurements are expressed as dB(A).
- Tonal Noise
  Noise containing a prominent frequency and characterised by a definite pitch.
- Low frequency noise
  Containing major components within the low frequency range (20Hz – 250 Hz) of the frequency spectrum.
- Impulsive noise
  Noise having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
- Fluctuating noise
  Noise that varies continuously and to an appreciable extent over the period of observation.
- Intermittent noise
  The level suddenly drops to that of the background noise several times during the period of observation.
- Adjustment for duration
  Applied where a single – event noise is continuous for a period of less than two and a half hours in any 24-hour period.

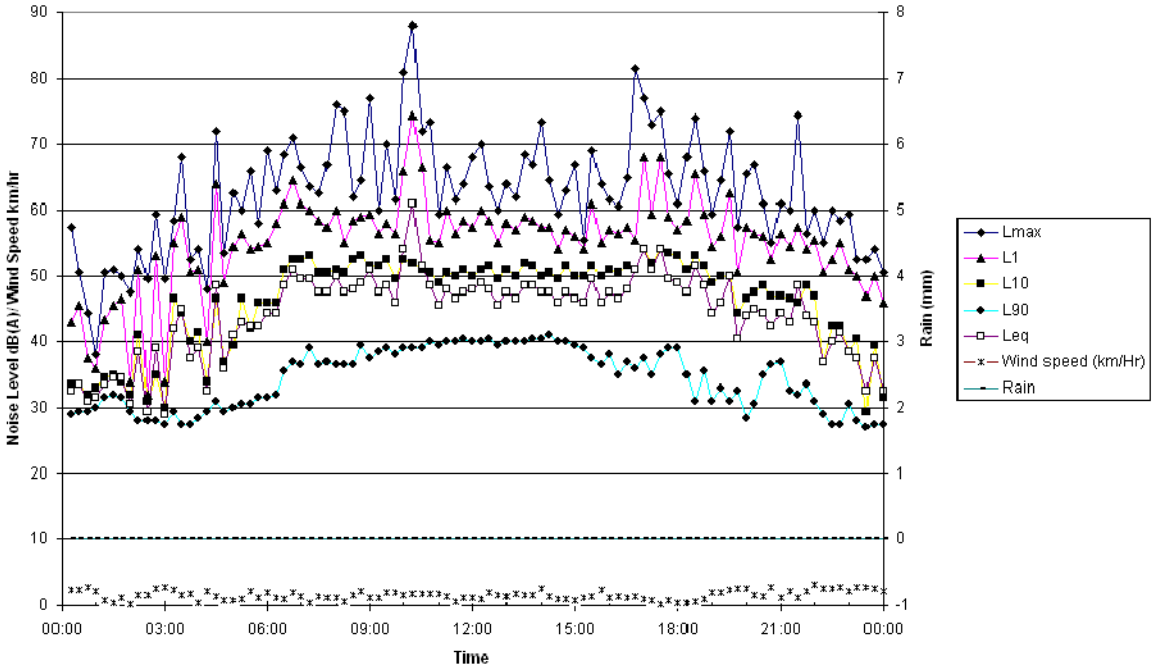
Measured Noise Levels
R1 - Brentwood - Wednesday 11/04/2012



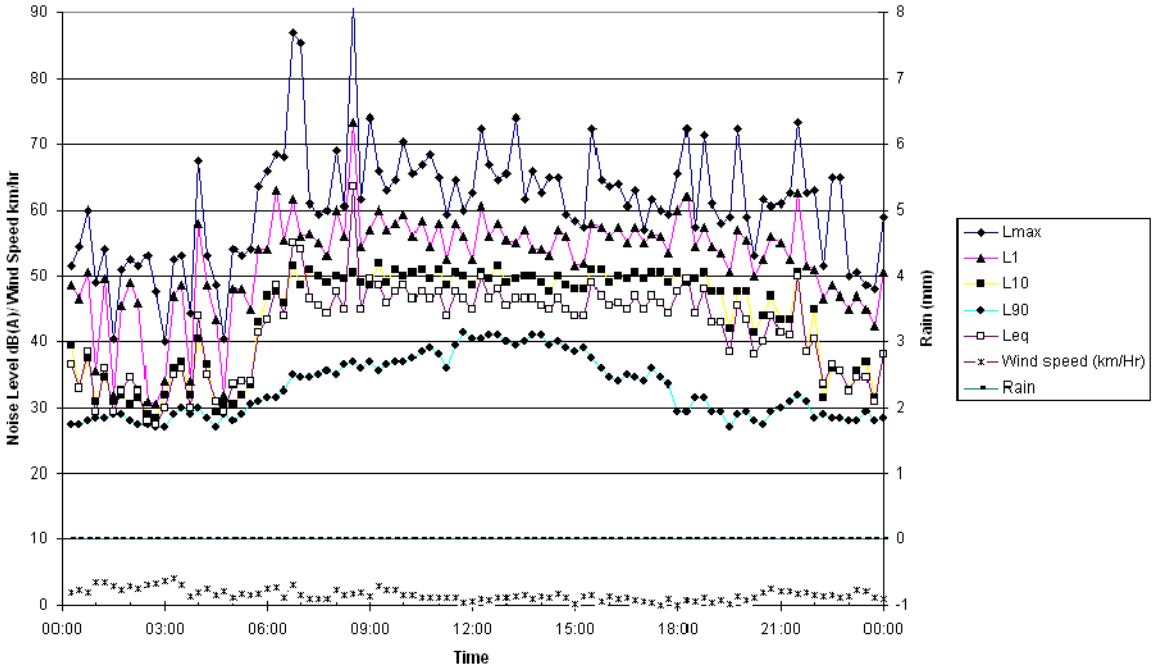
Measured Noise Levels
R1 - Brentwood - Thursday 12/04/2012



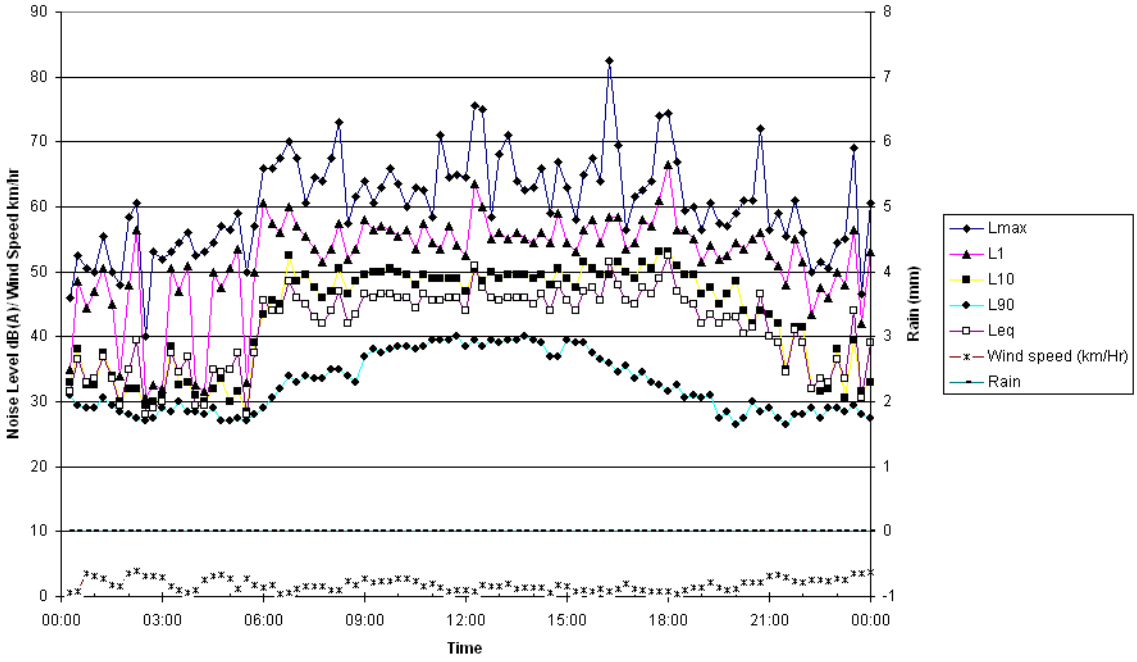
Measured Noise Levels
R1 - Brentwood - Friday 13/04/2012



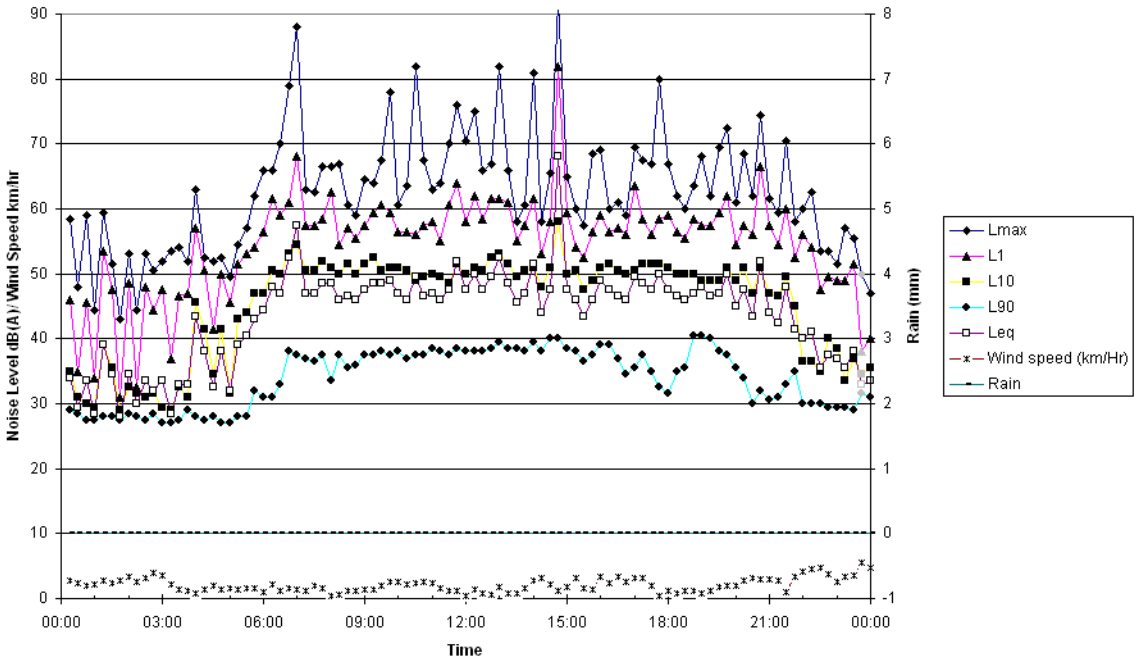
Measured Noise Levels
R1 - Brentwood - Saturday 14/04/2012



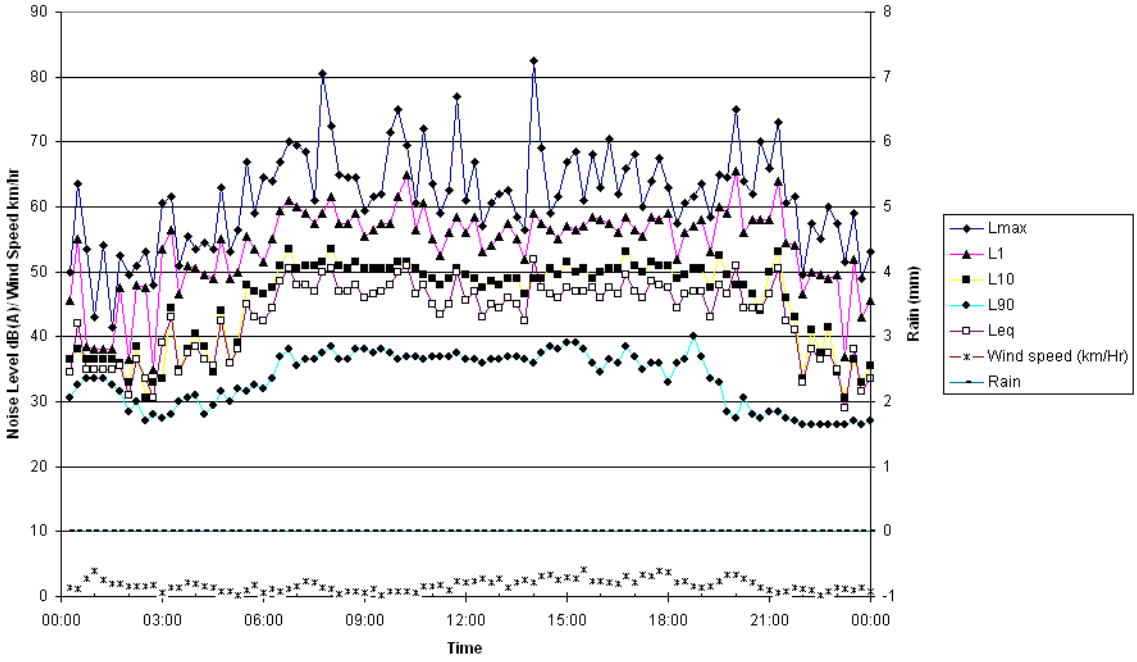
Measured Noise Levels
R1 - Brentwood - Sunday 15/04/2012



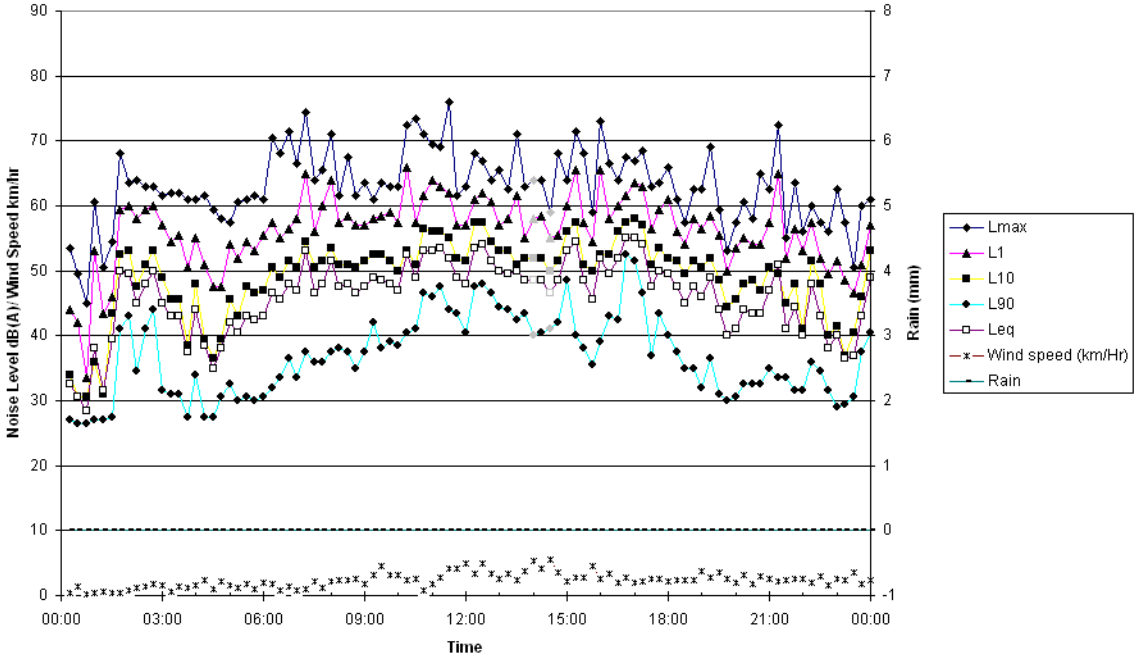
Measured Noise Levels
R1 - Brentwood - Monday 16/04/2012



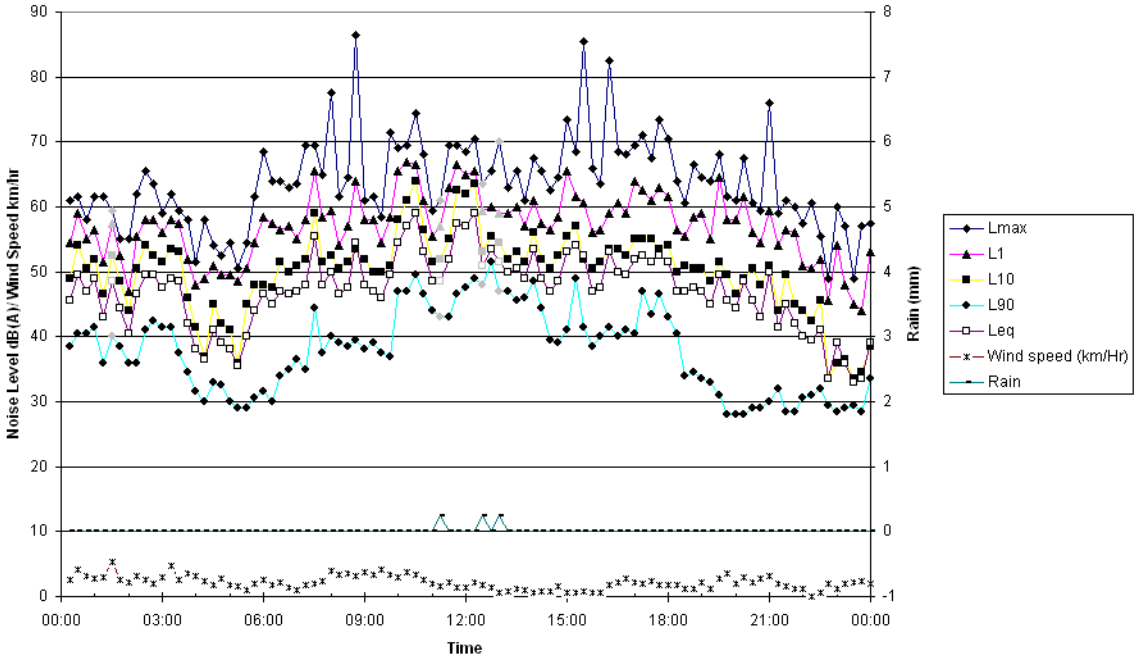
Measured Noise Levels
R1 - Brentwood - Tuesday 17/04/2012



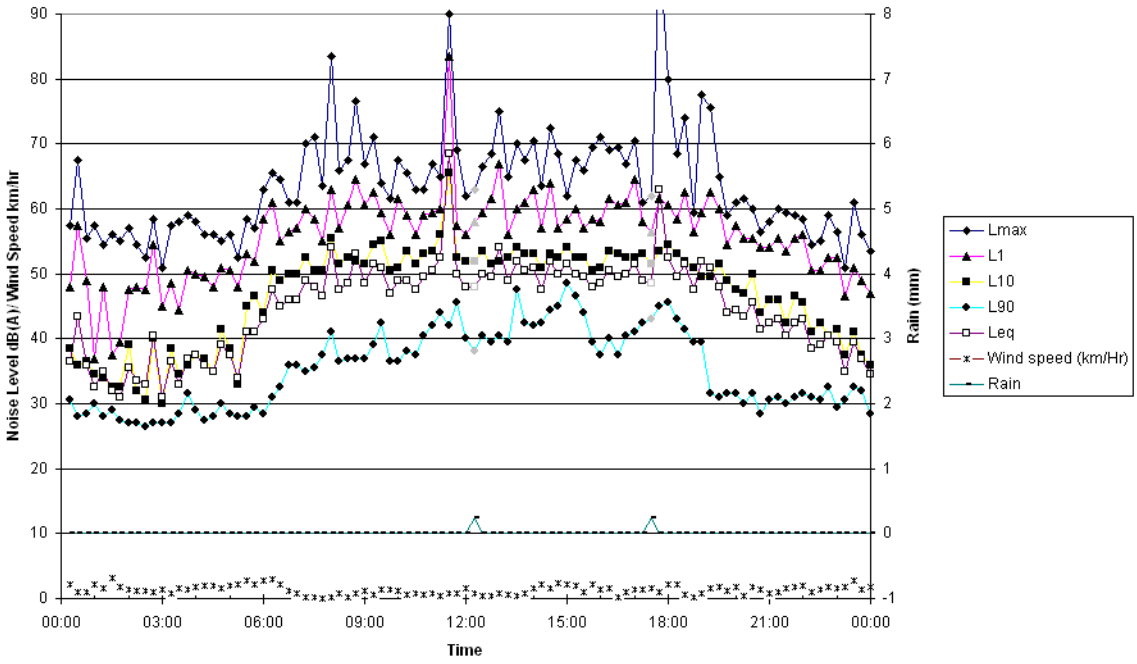
Measured Noise Levels
R1 - Brentwood - Wednesday 18/04/2012



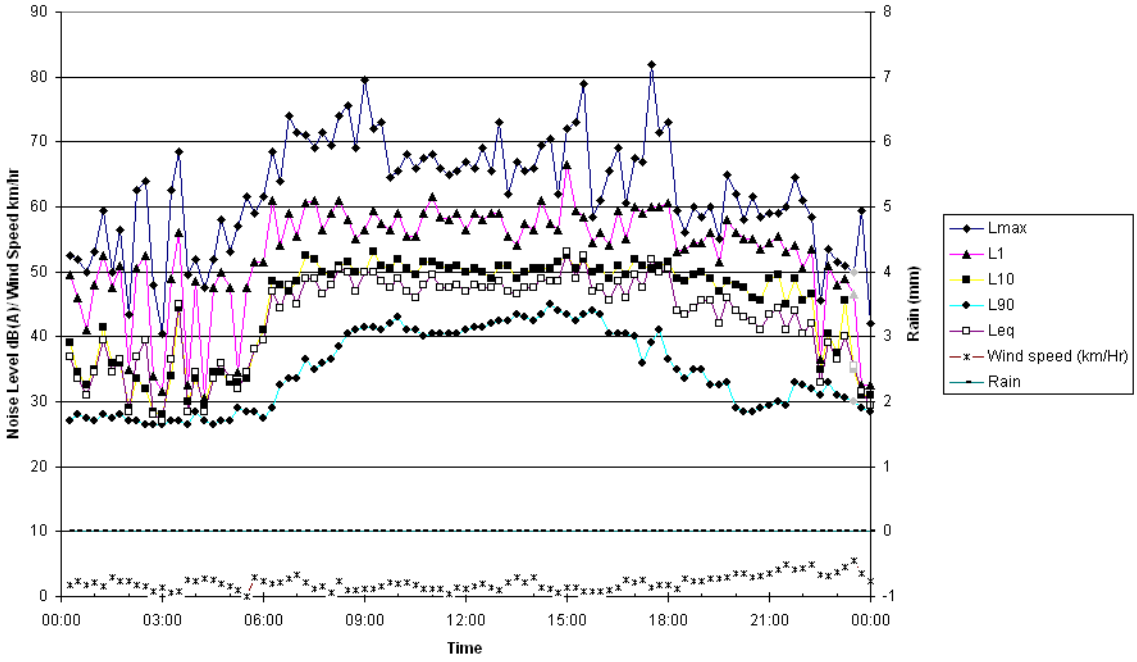
Measured Noise Levels
R1 - Brentwood - Thursday 19/04/2012



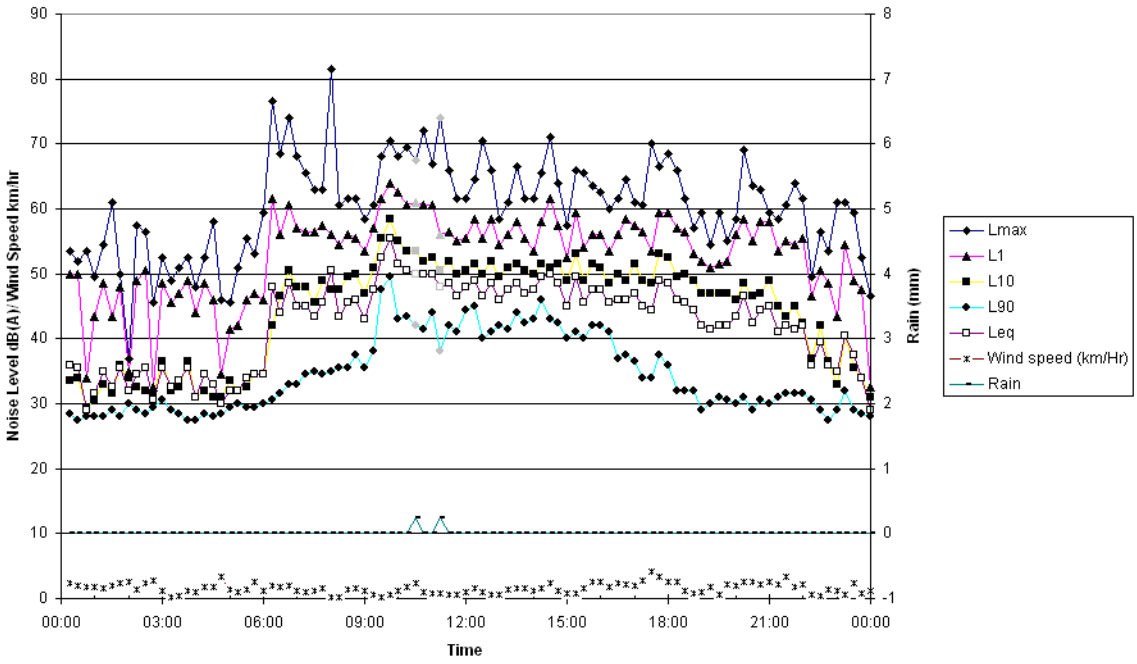
Measured Noise Levels
R1 - Brentwood - Friday 20/04/2012



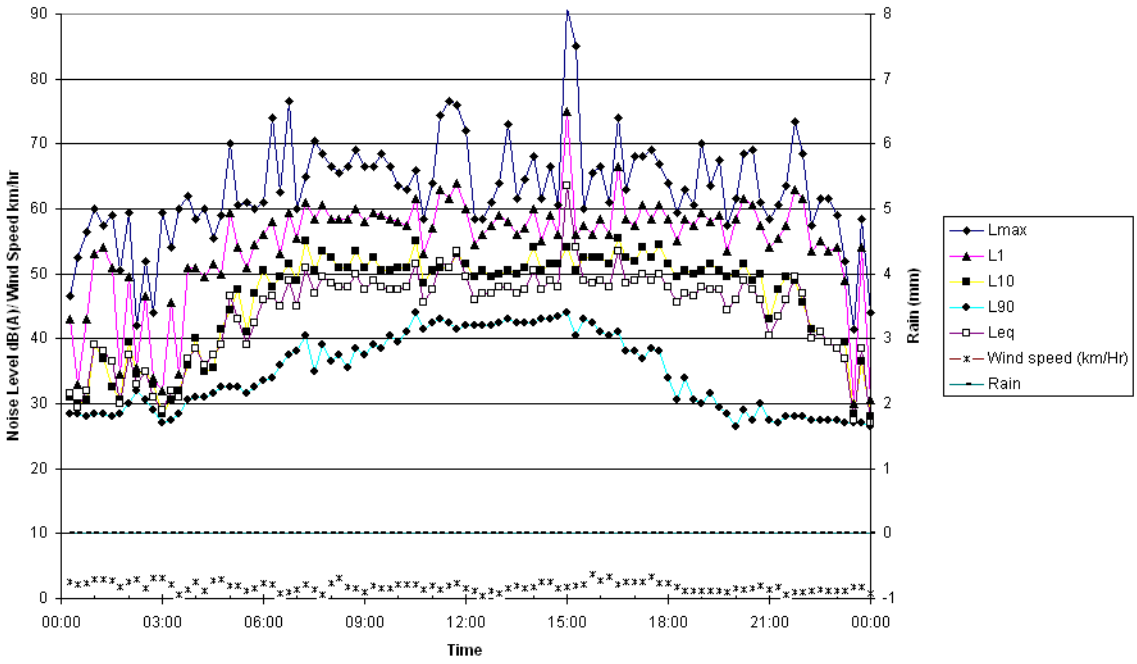
Measured Noise Levels
R1 - Brentwood - Saturday 21/04/2012



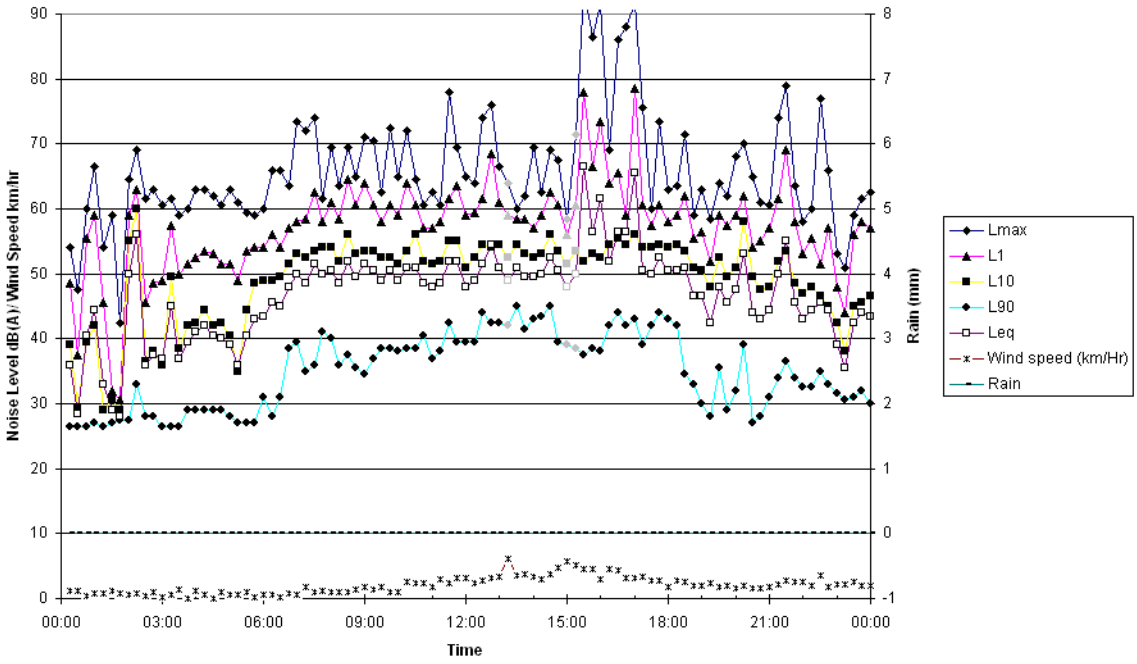
Measured Noise Levels
R1 - Brentwood - Sunday 22/04/2012



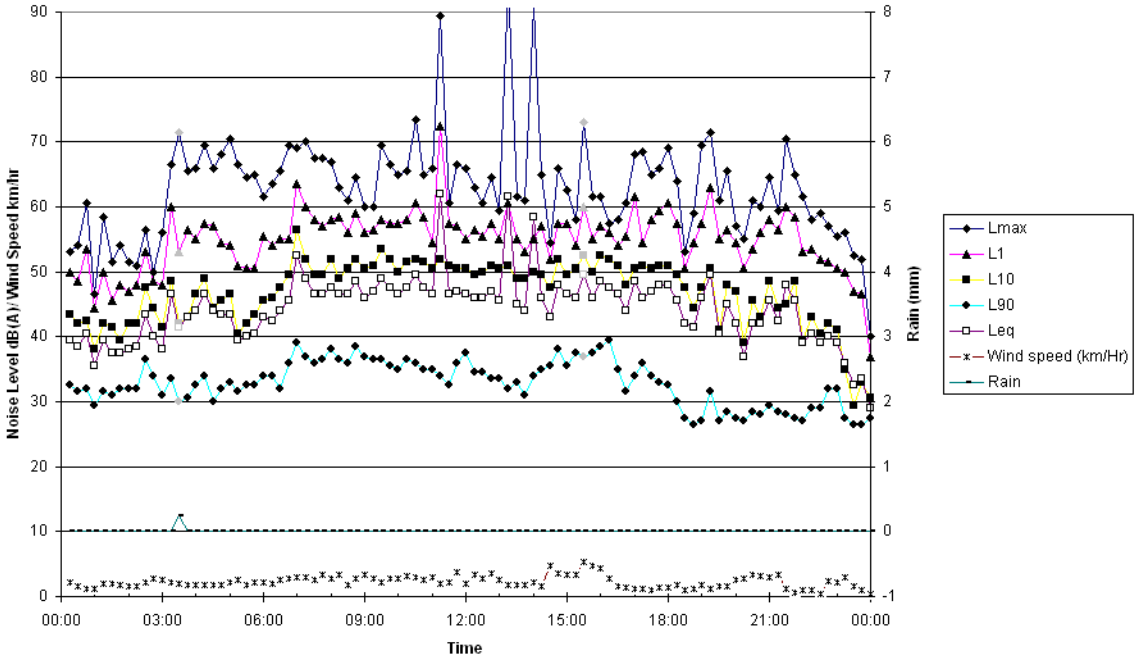
Measured Noise Levels
R1 - Brentwood - Monday 23/04/2012



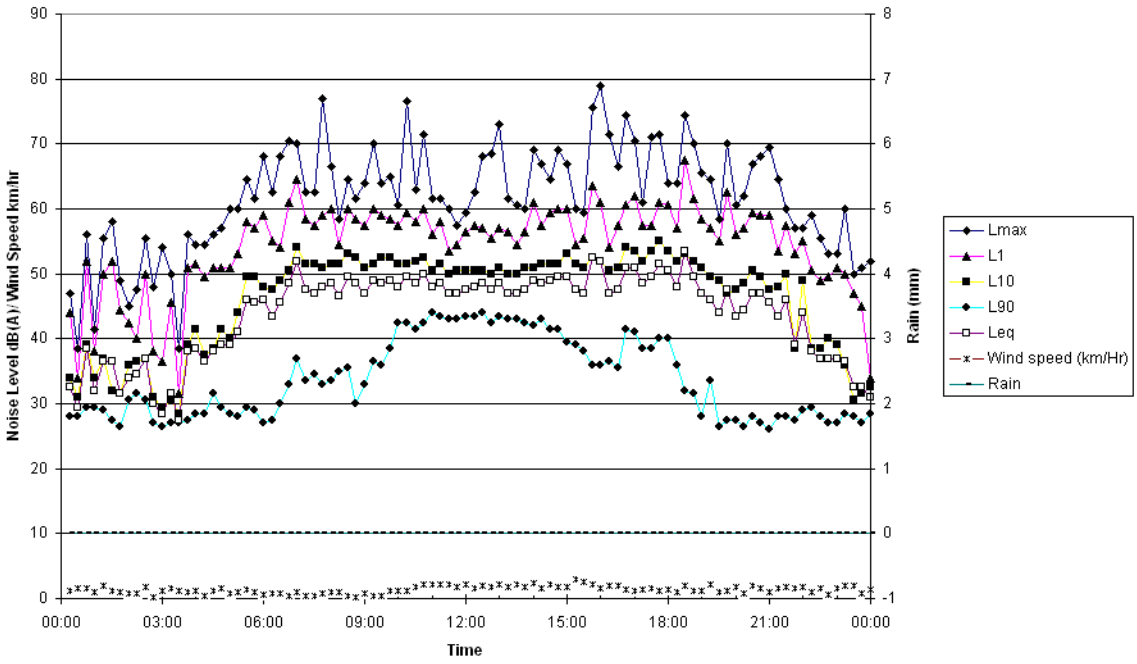
Measured Noise Levels
R1 - Brentwood - Tuesday 24/04/2012



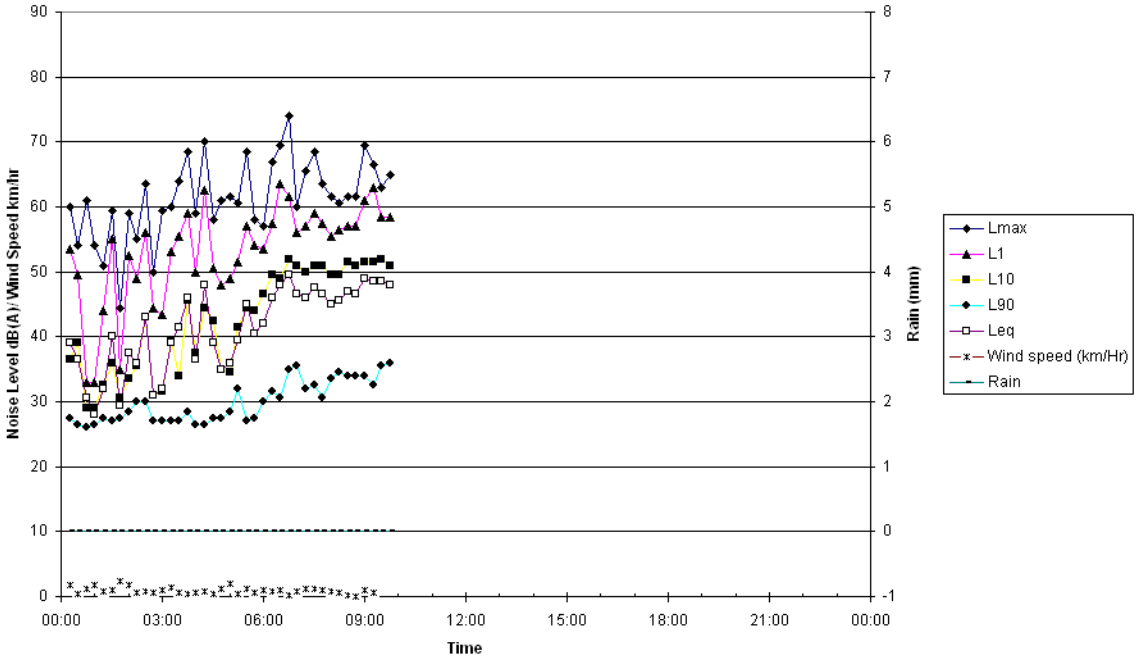
Measured Noise Levels
R1 - Brentwood - Wednesday 25/04/2012



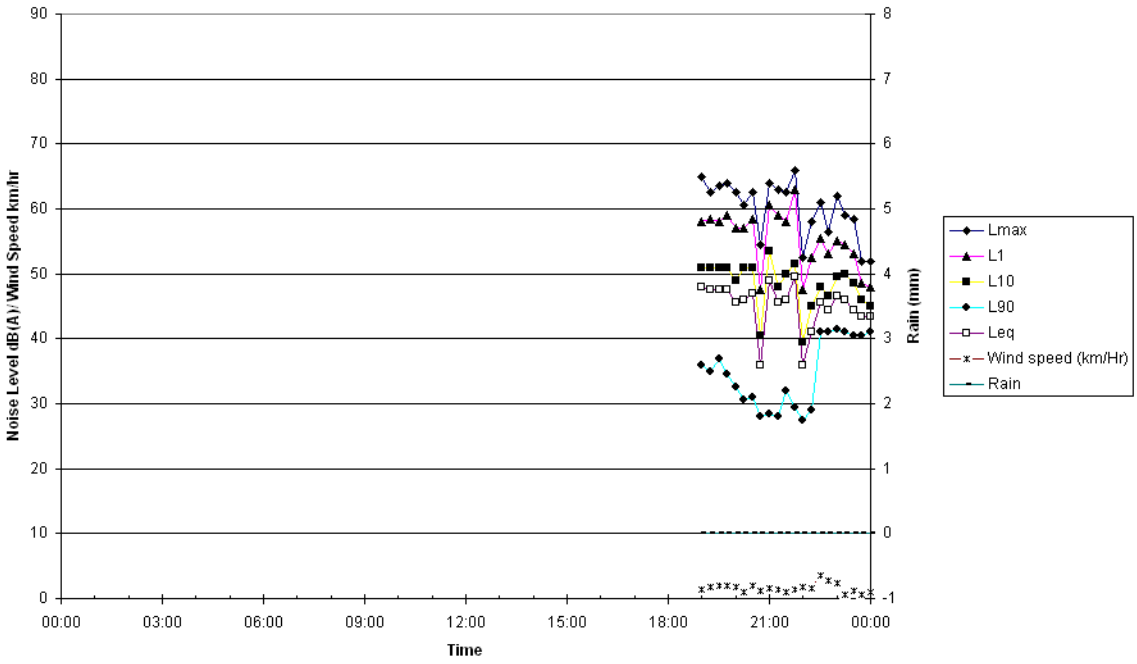
Measured Noise Levels
R1 - Brentwood - Thursday 26/04/2012



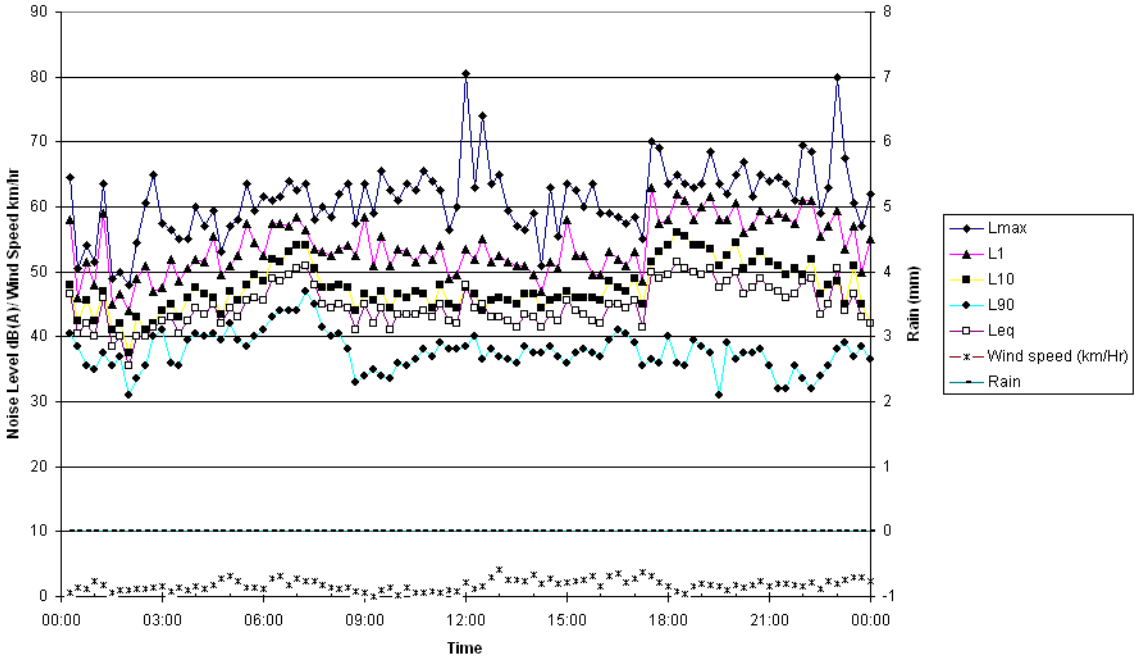
Measured Noise Levels
R1 - Brentwood - Friday 27/04/2012



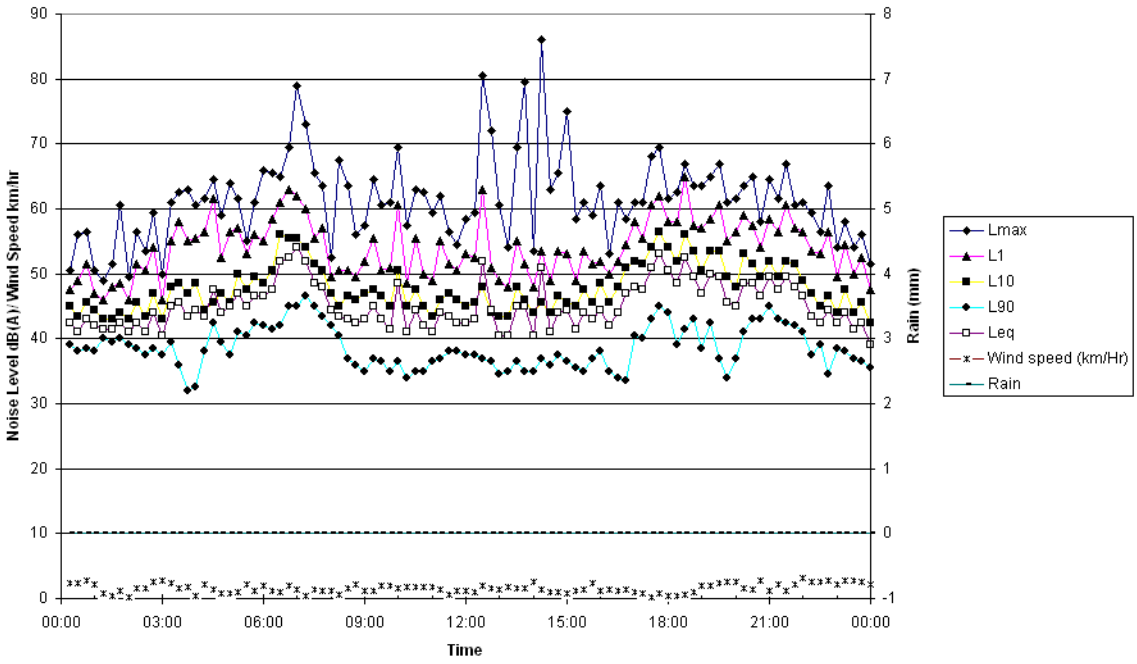
Measured Noise Levels
R2 - Glengarry - Wednesday 11/04/2012



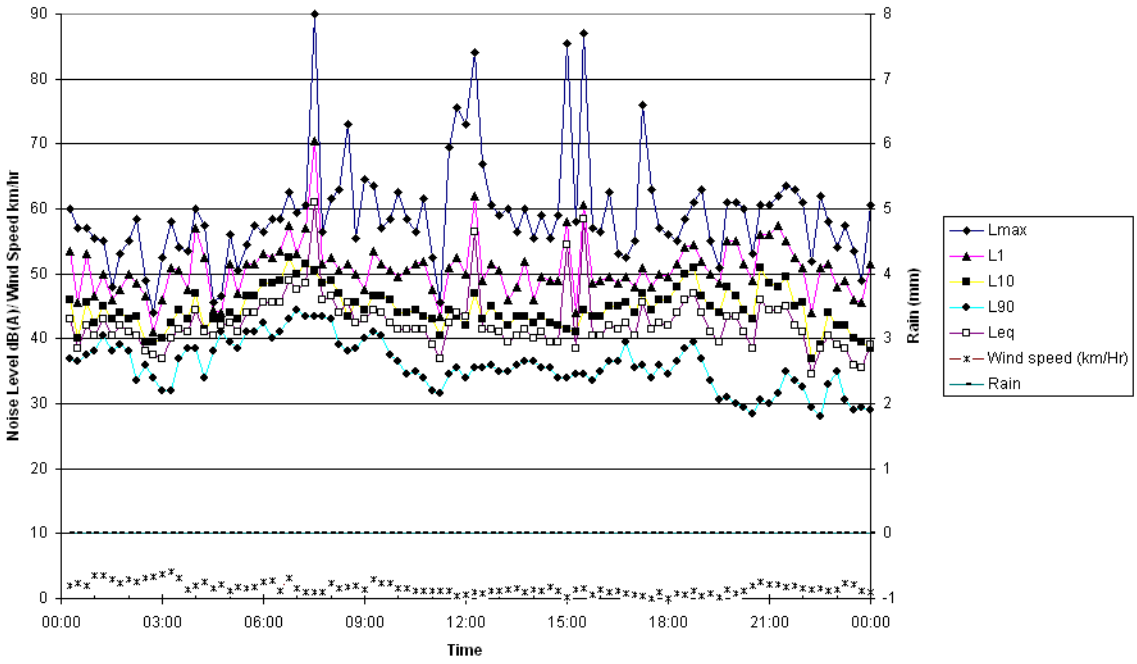
Measured Noise Levels
R2 - Glengarry - Thursday 12/04/2012



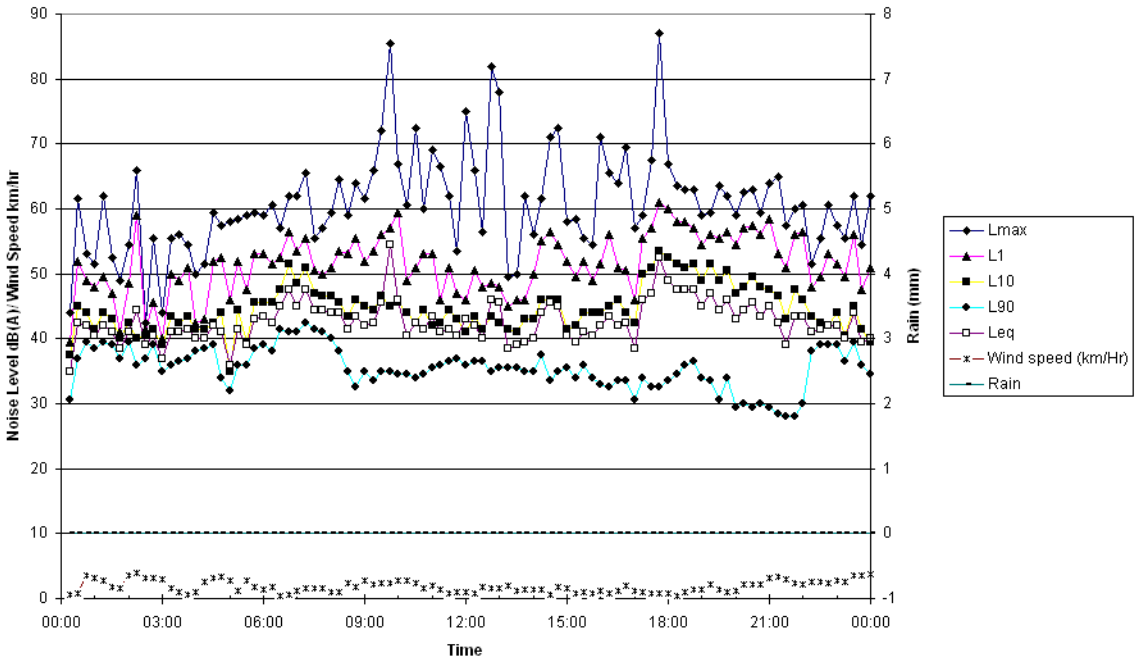
Measured Noise Levels
R2 - Glengarry - Friday 13/04/2012



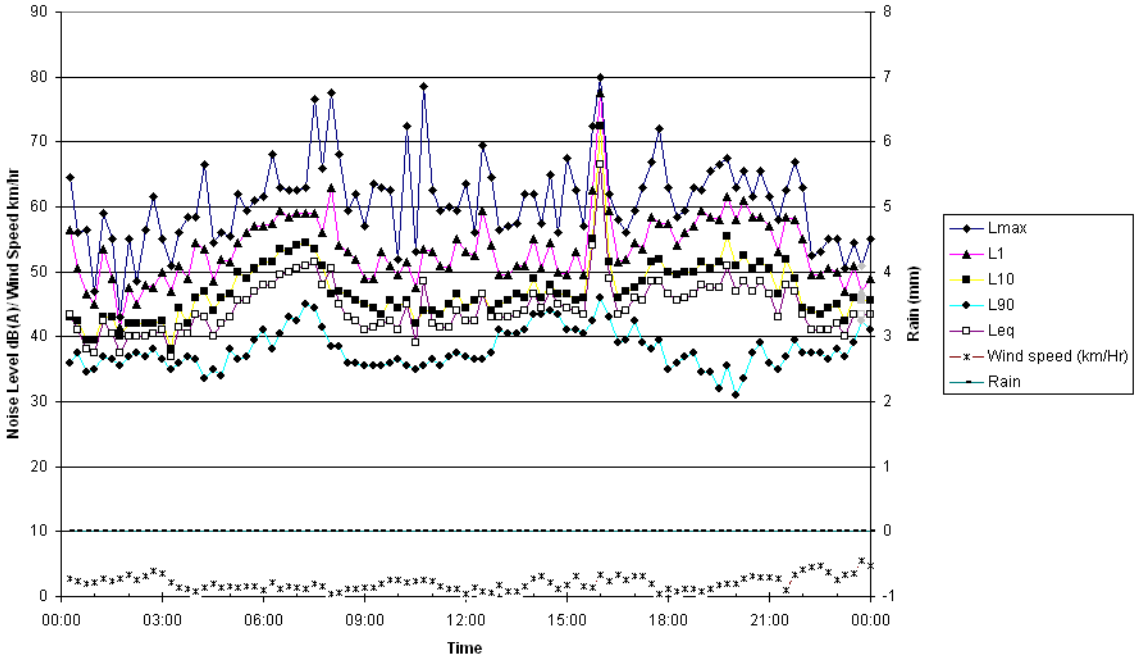
Measured Noise Levels
R2 - Glengarry - Saturday 14/04/2012



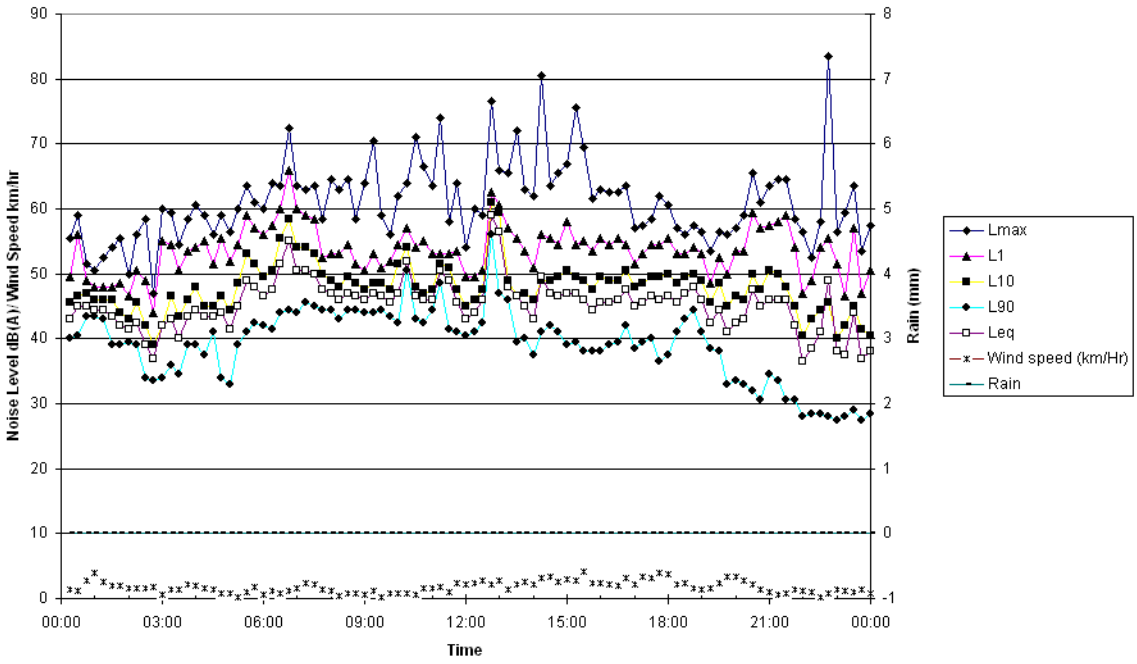
Measured Noise Levels
R2 - Glengarry - Sunday 15/04/2012



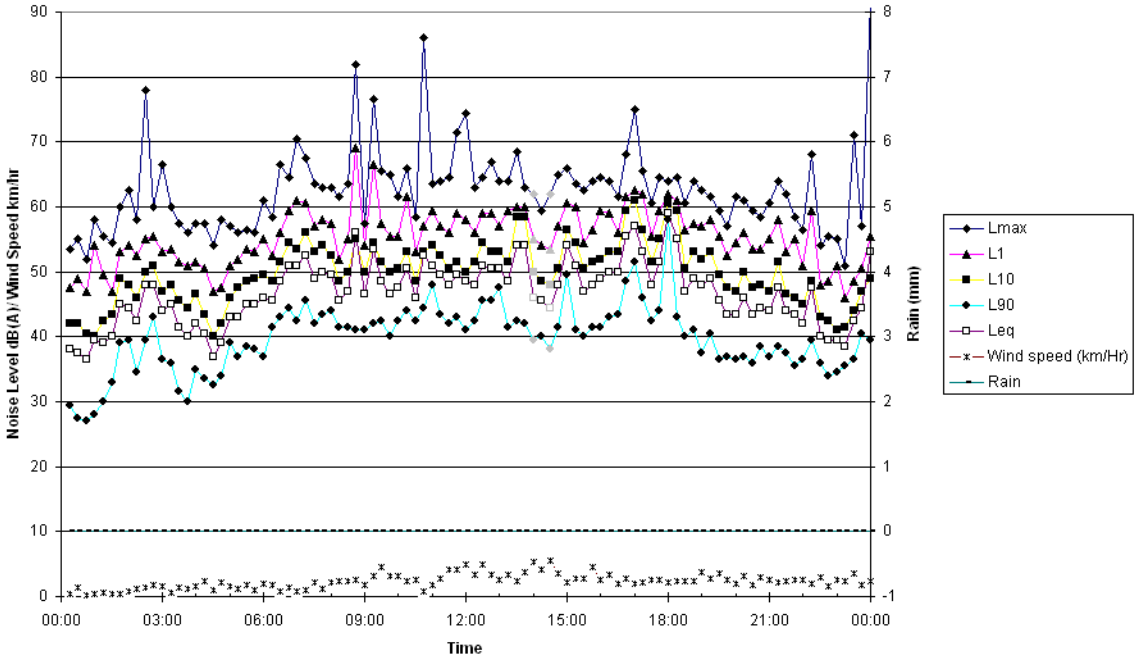
Measured Noise Levels
R2 - Glengarry - Monday 16/04/2012



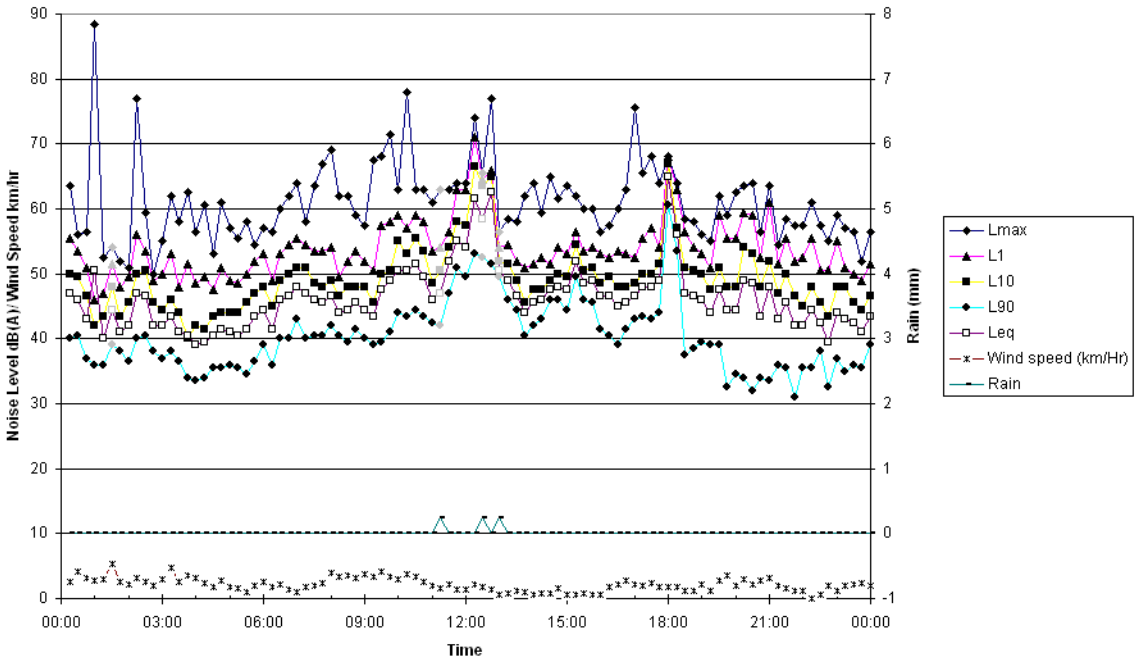
Measured Noise Levels
R2 - Glengarry - Tuesday 17/04/2012



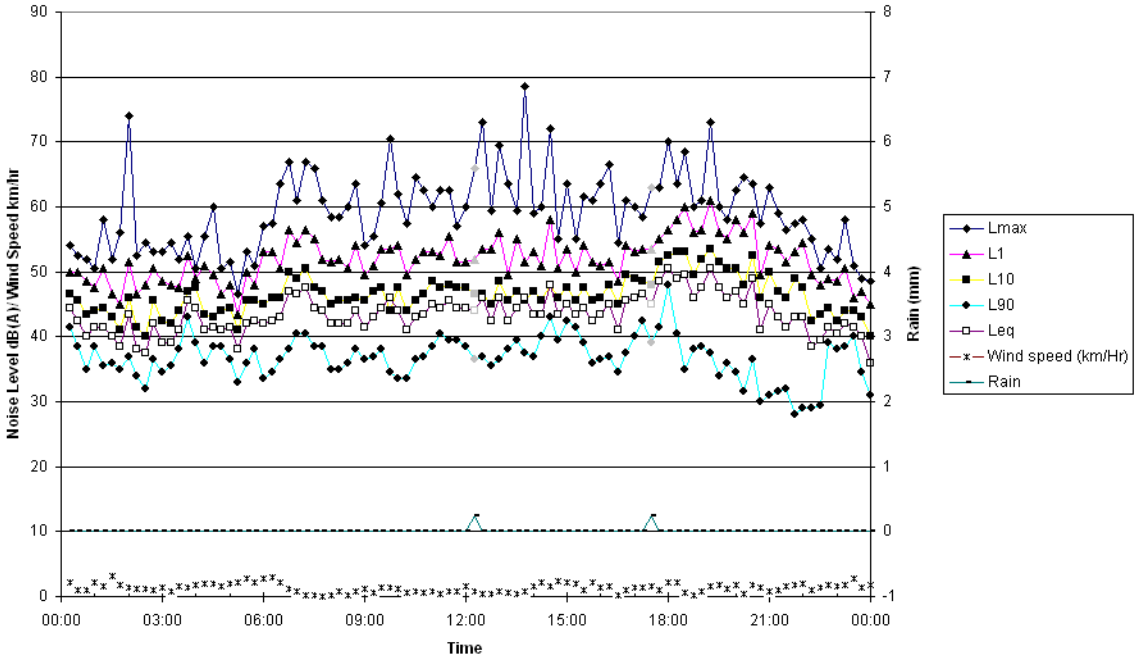
Measured Noise Levels
R2 - Glengarry - Wednesday 18/04/2012



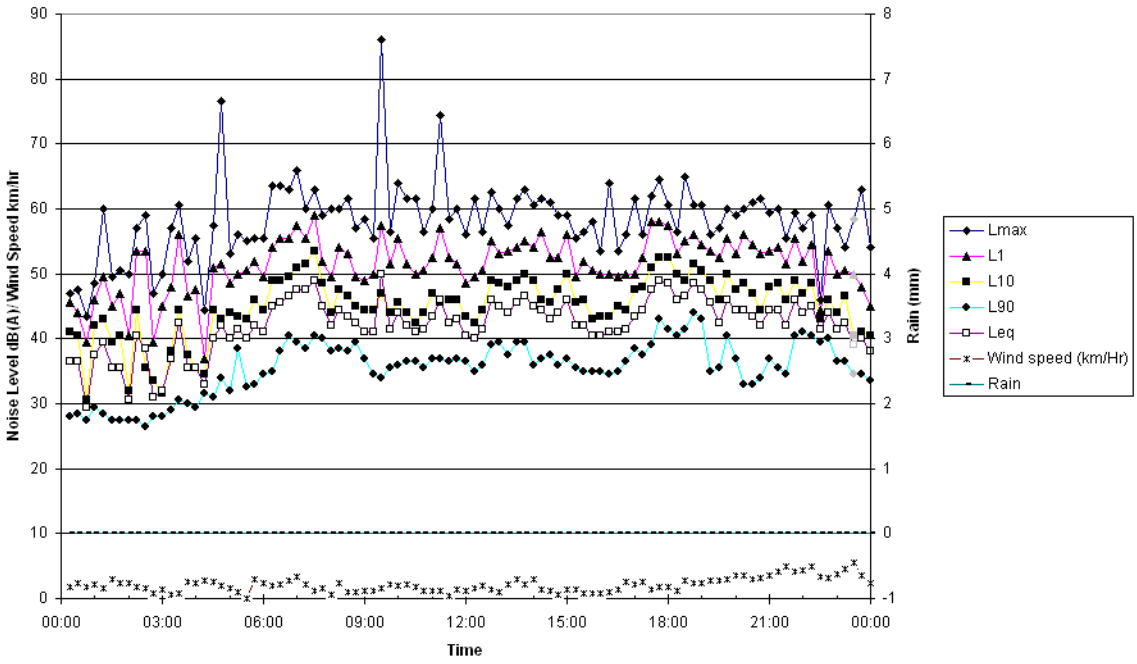
Measured Noise Levels
R2 - Glengarry - Thursday 19/04/2012



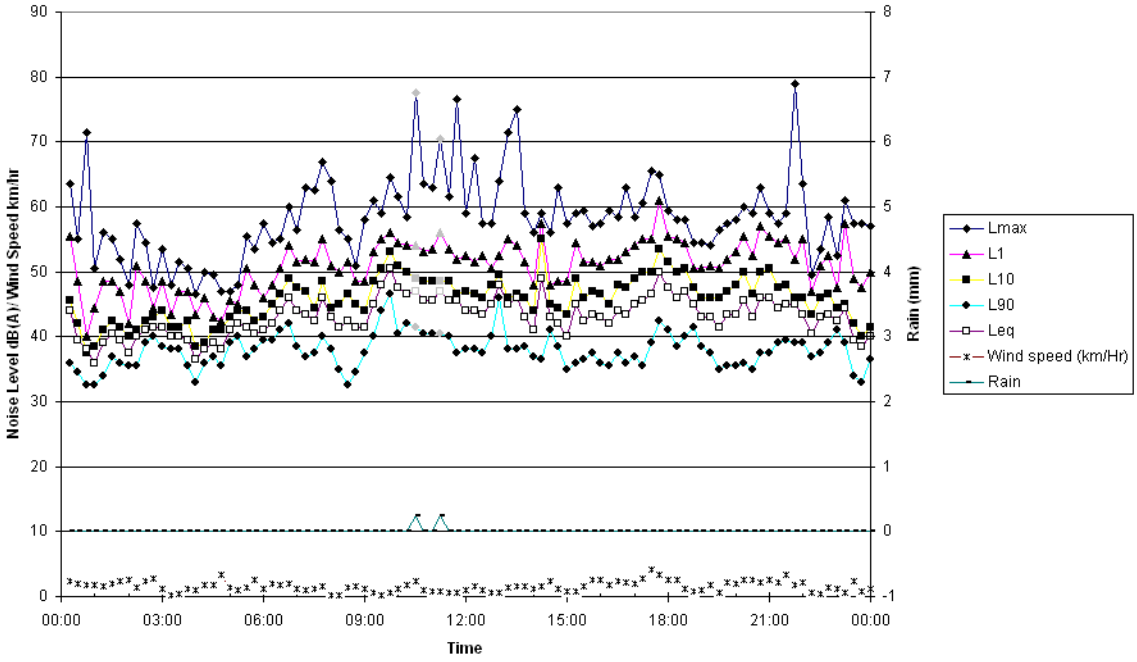
Measured Noise Levels
R2 - Glengarry - Friday 20/04/2012



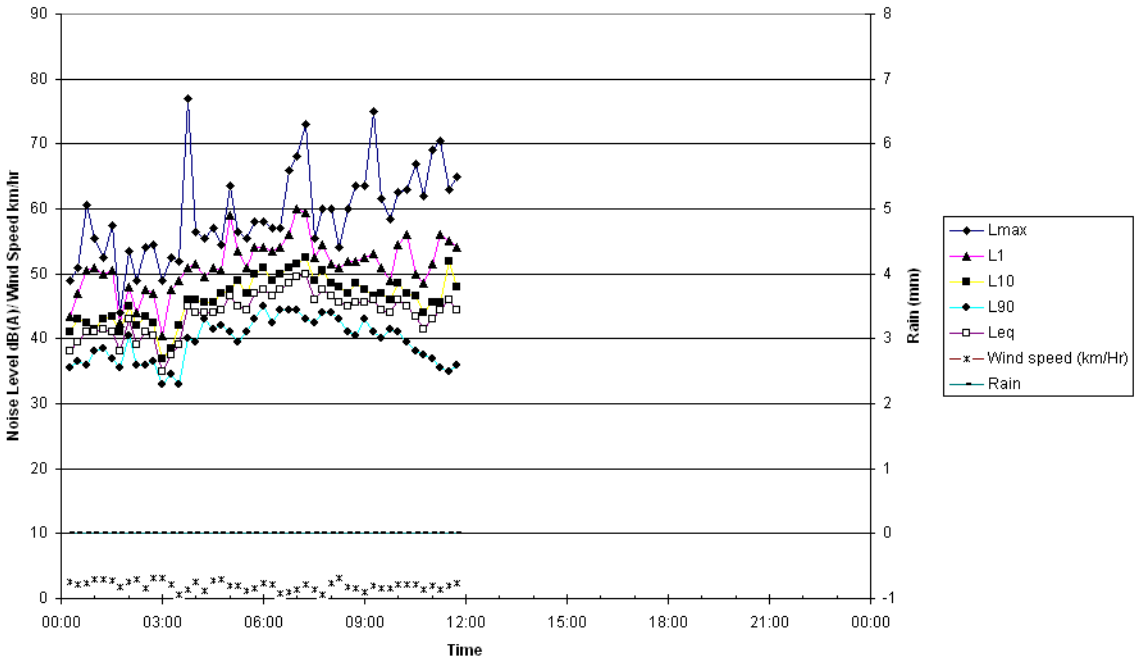
Measured Noise Levels
R2 - Glengarry - Saturday 21/04/2012



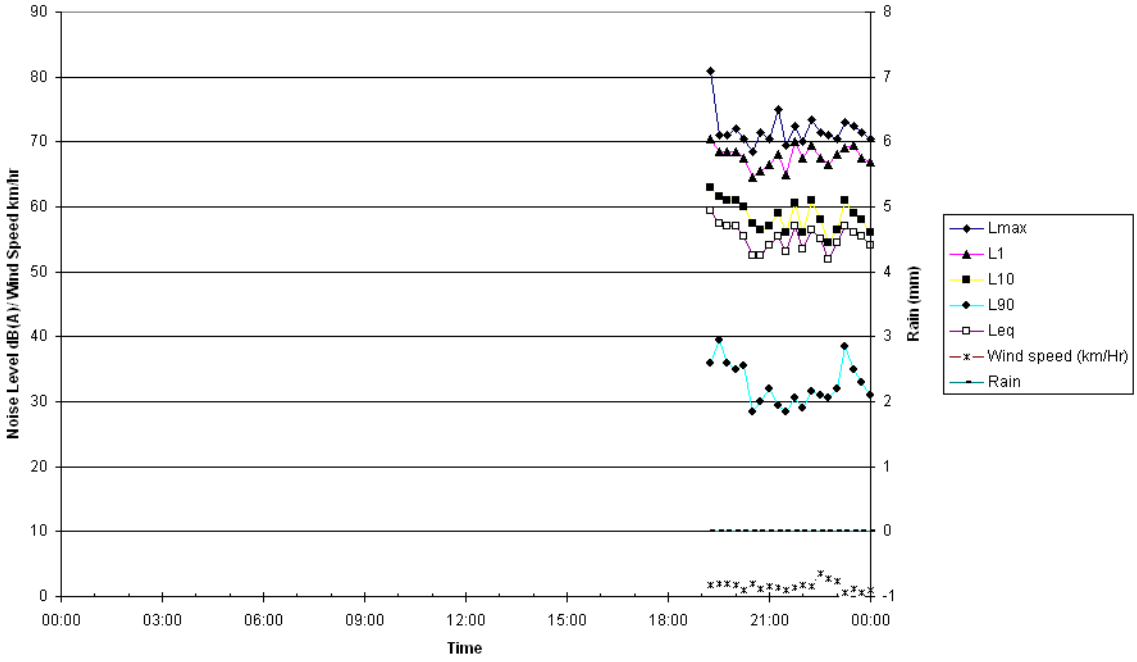
Measured Noise Levels
R2 - Glengarry - Sunday 22/04/2012



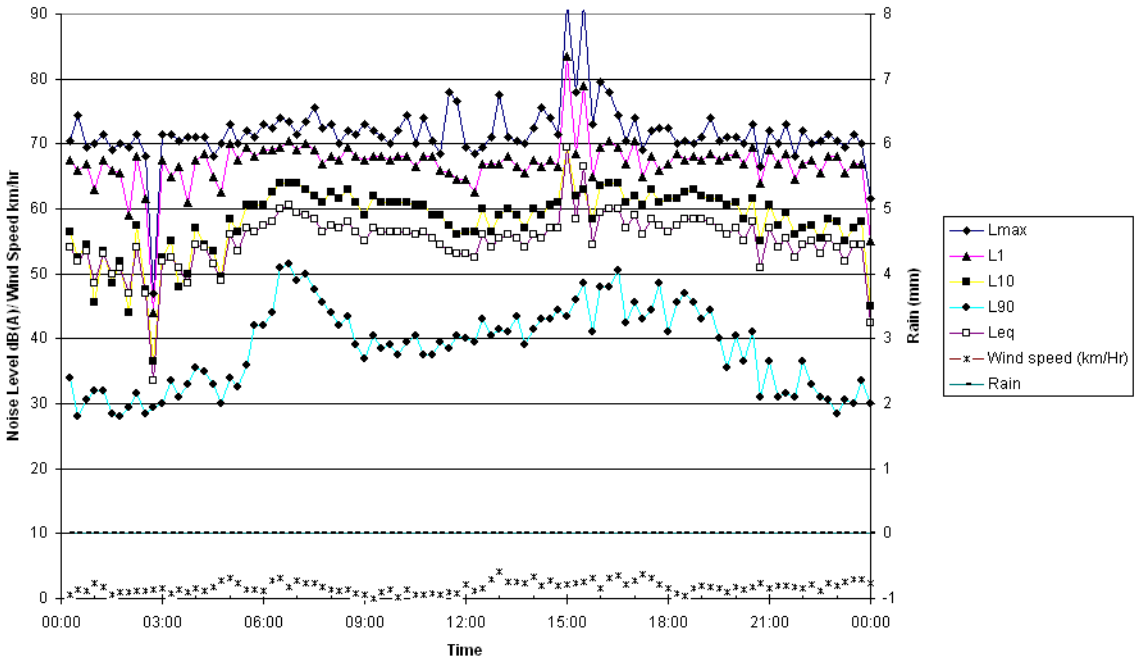
Measured Noise Levels
R2 - Glengarry - Monday 23/04/2012



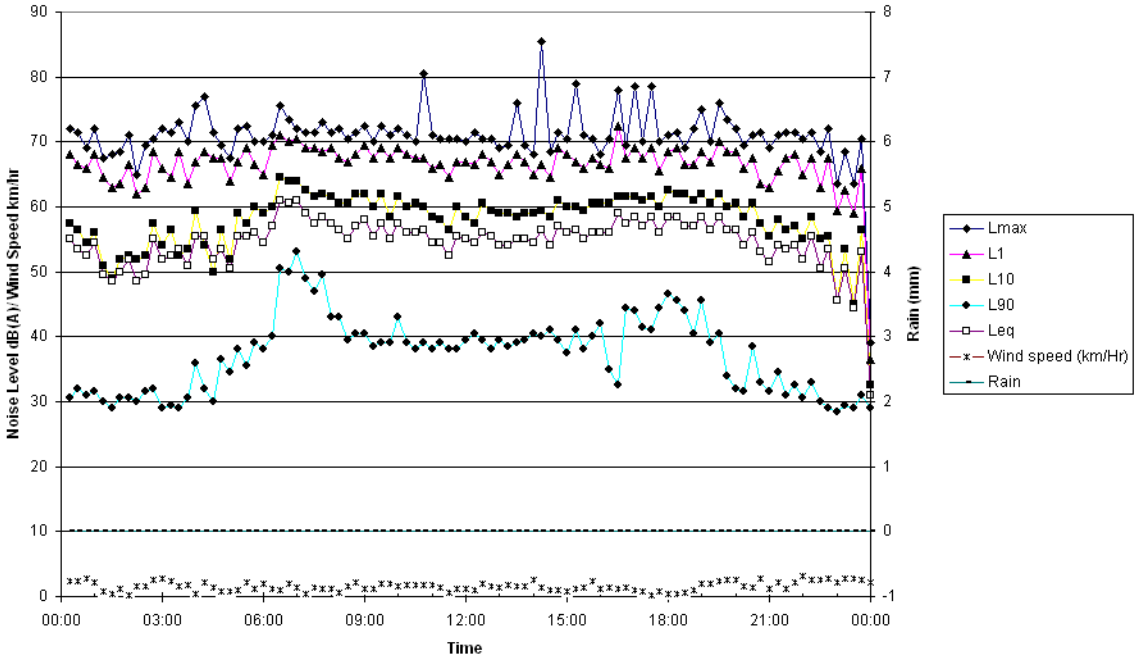
Measured Noise Levels
R3 - Beale - Wednesday 11/04/2012



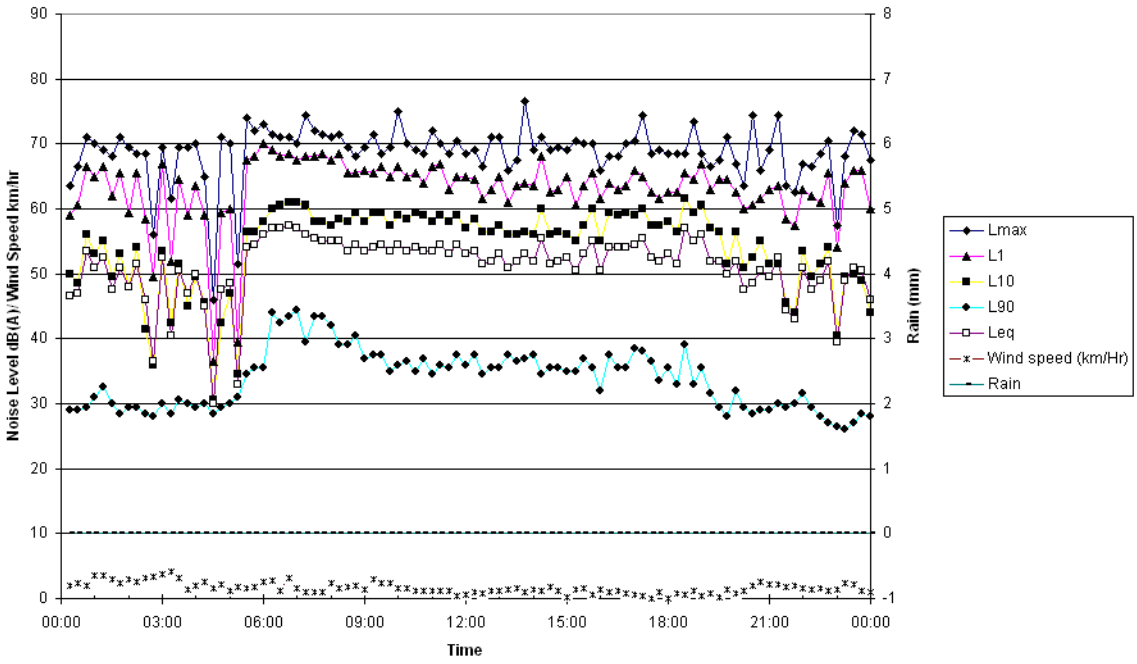
Measured Noise Levels
R3 - Beale - Thursday 12/04/2012



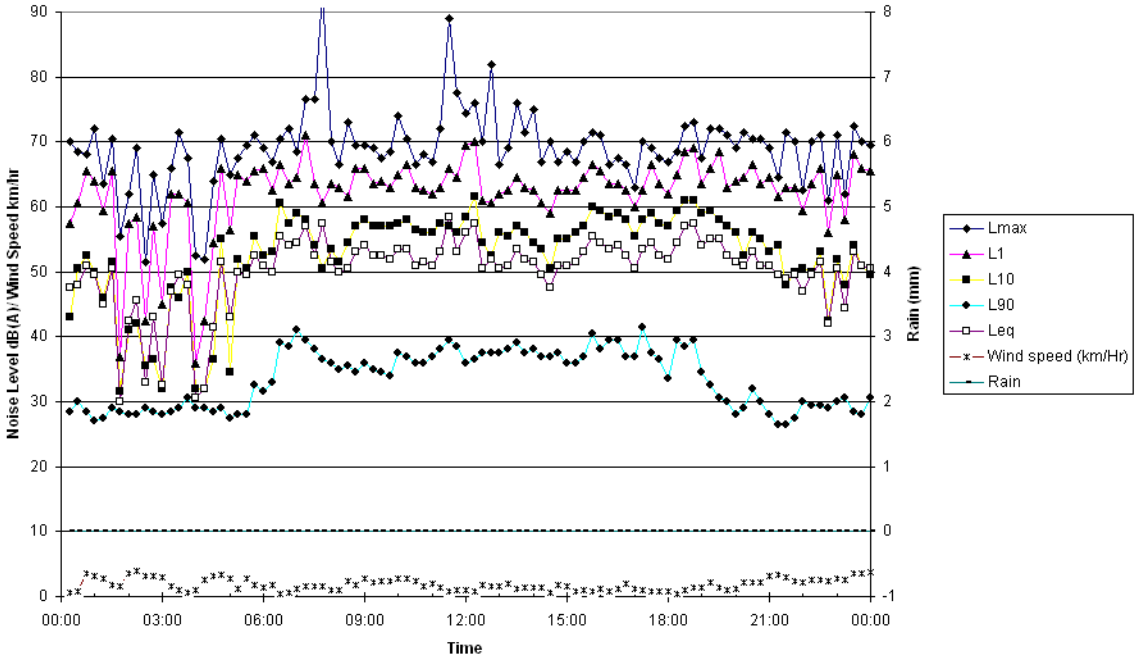
Measured Noise Levels
R3 - Beale - Friday 13/04/2012



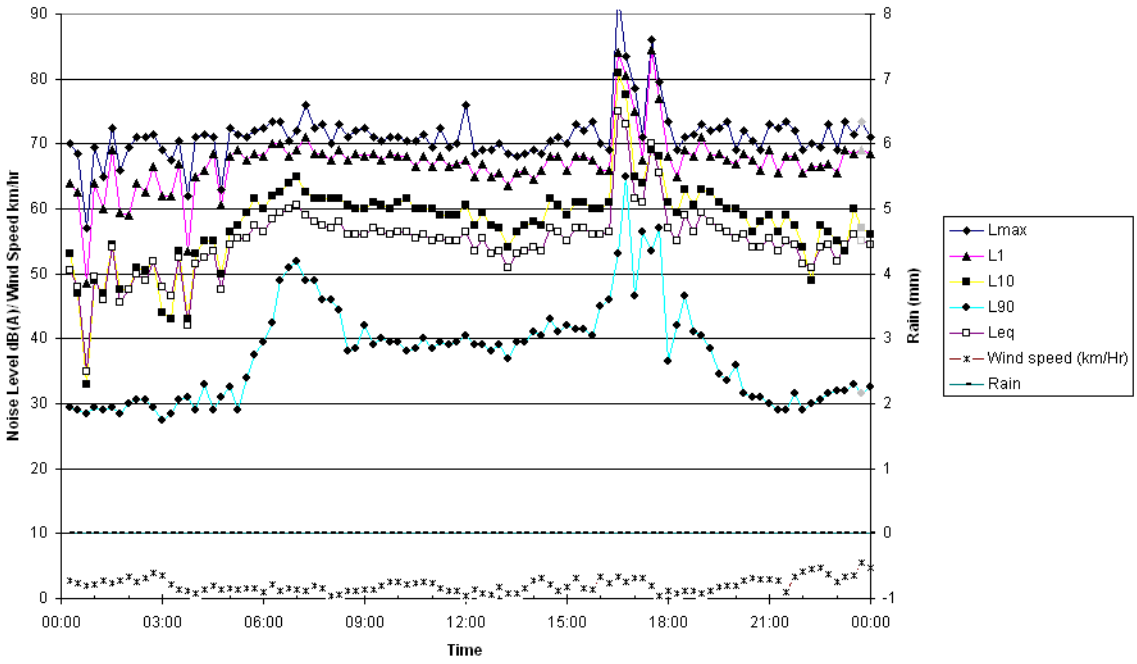
Measured Noise Levels
R3 - Beale - Saturday 14/04/2012



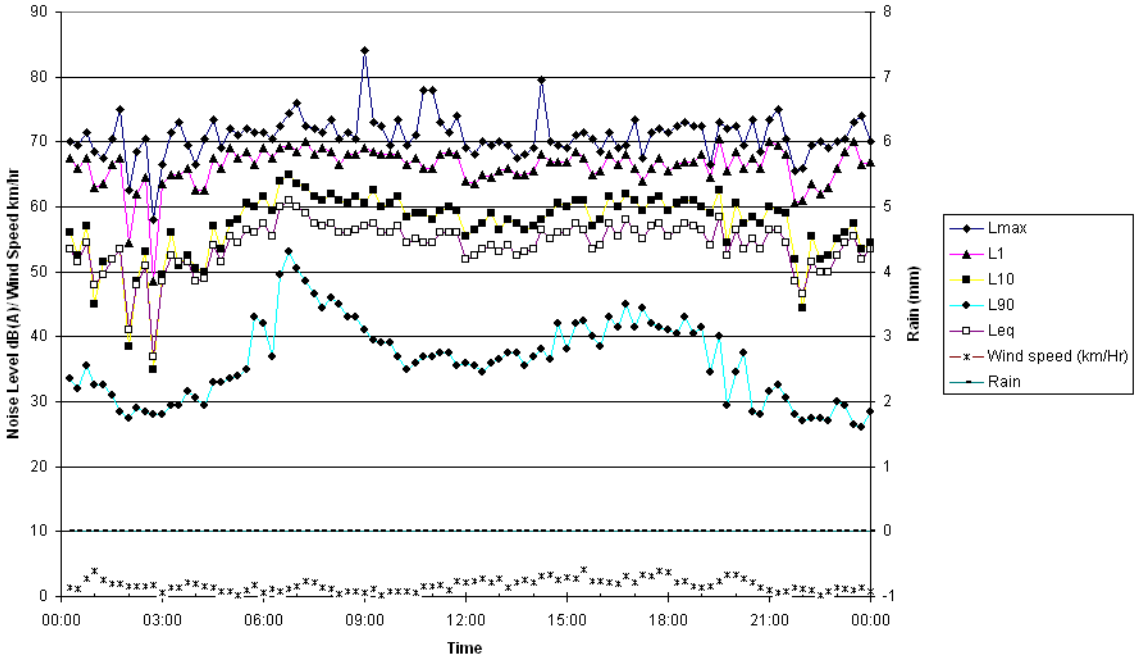
Measured Noise Levels
R3 - Beale - Sunday 15/04/2012



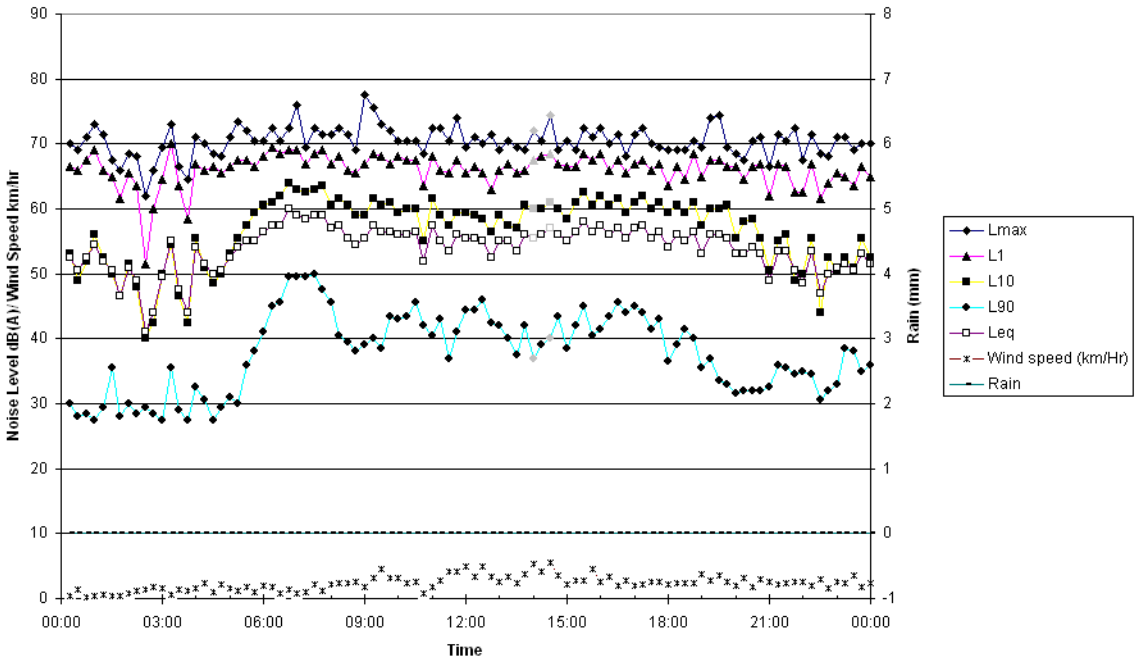
Measured Noise Levels
R3 - Beale - Monday 16/04/2012



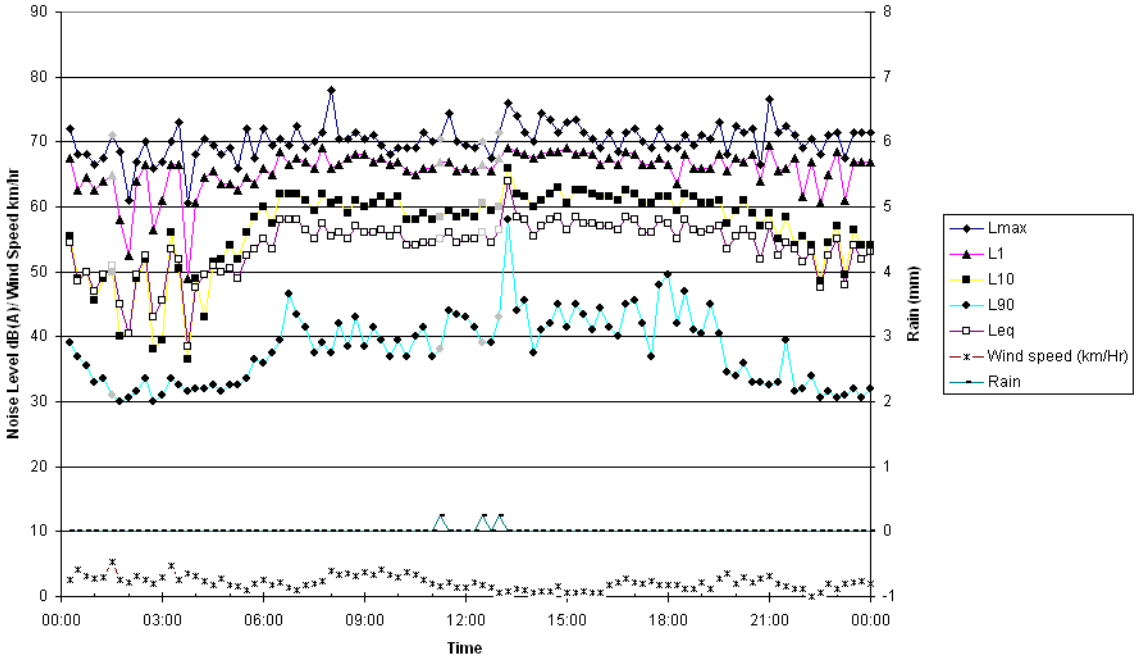
Measured Noise Levels
R3 - Beale - Tuesday 17/04/2012



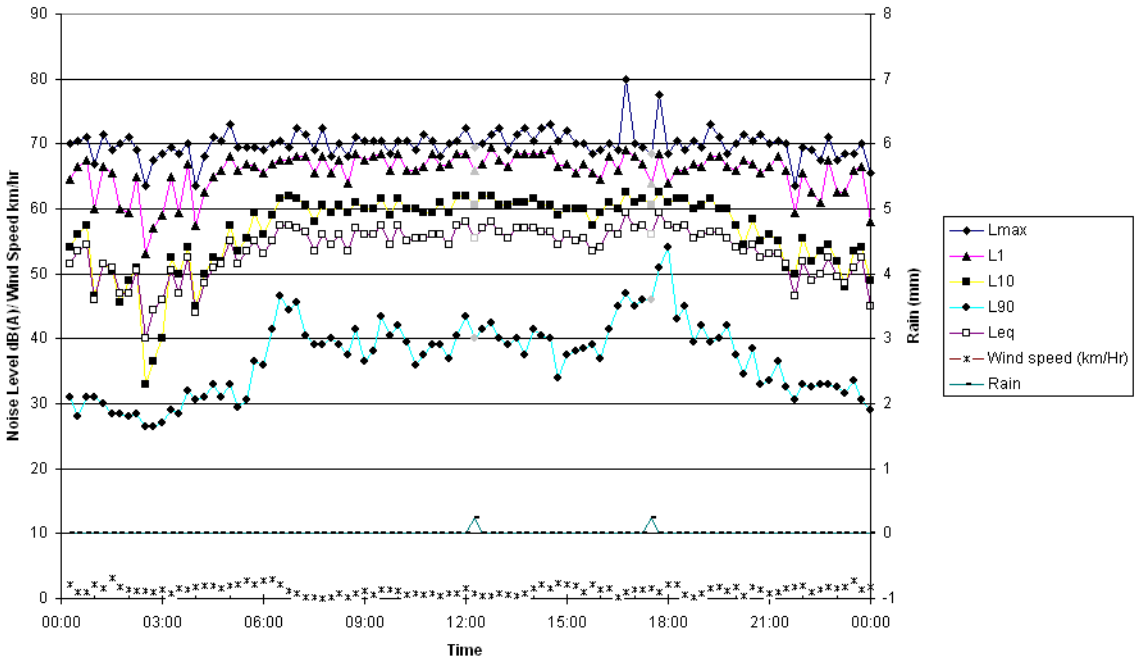
Measured Noise Levels
R3 - Beale - Wednesday 18/04/2012



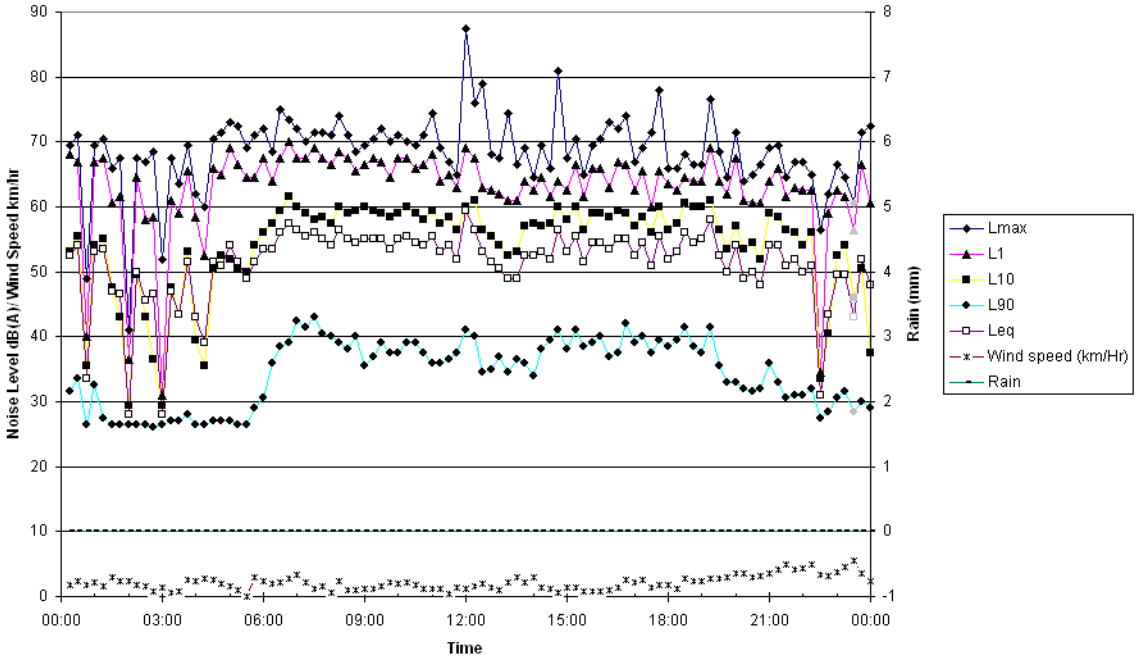
Measured Noise Levels
R3 - Beale - Thursday 19/04/2012



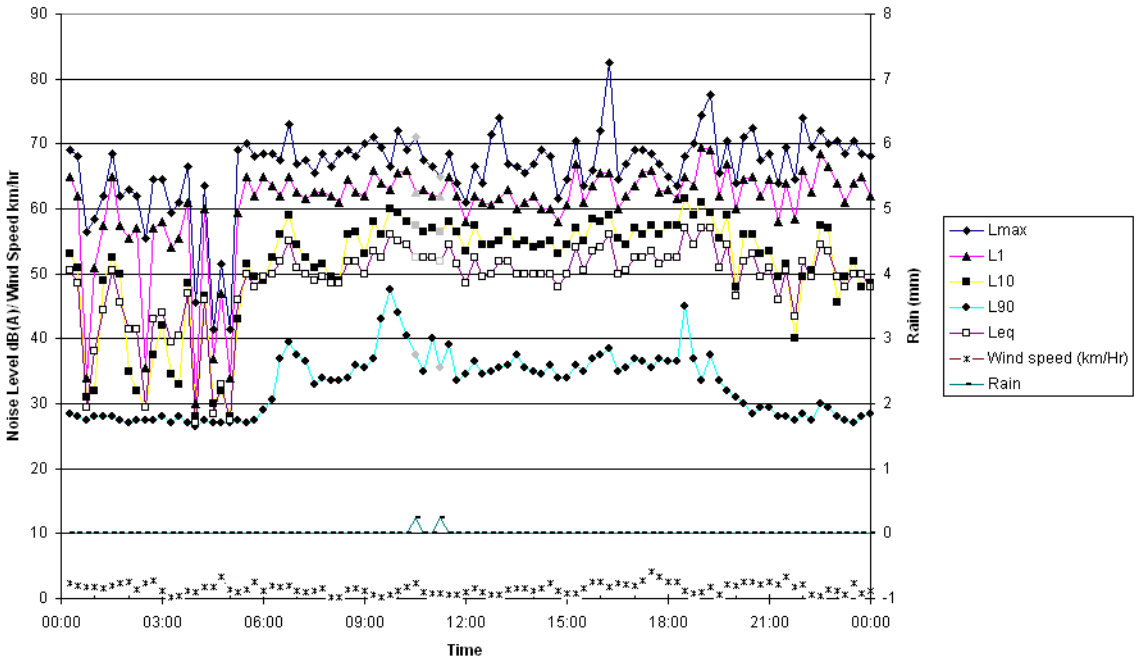
Measured Noise Levels
R3 - Beale - Friday 20/04/2012



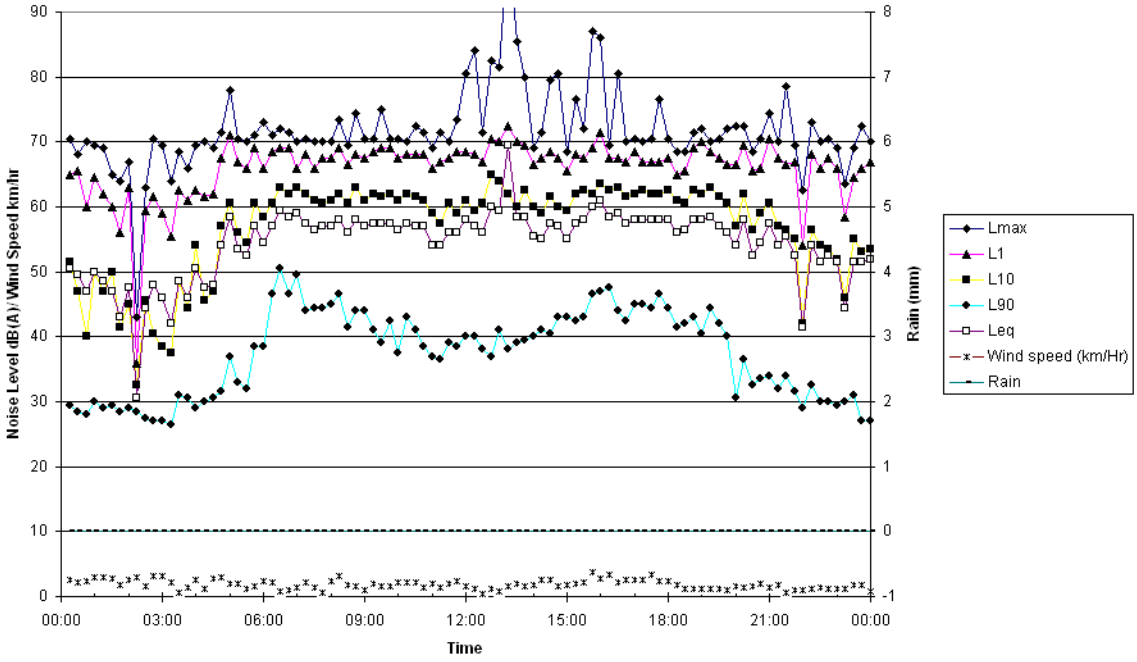
Measured Noise Levels
R3 - Beale - Saturday 21/04/2012



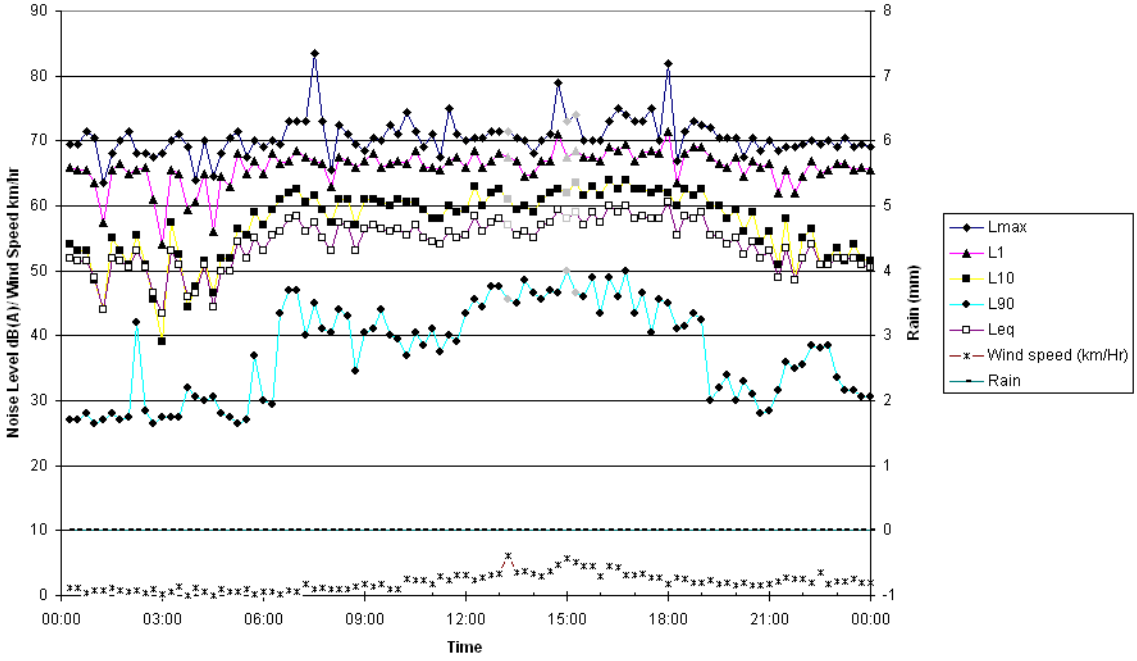
Measured Noise Levels
R3 - Beale - Sunday 22/04/2012



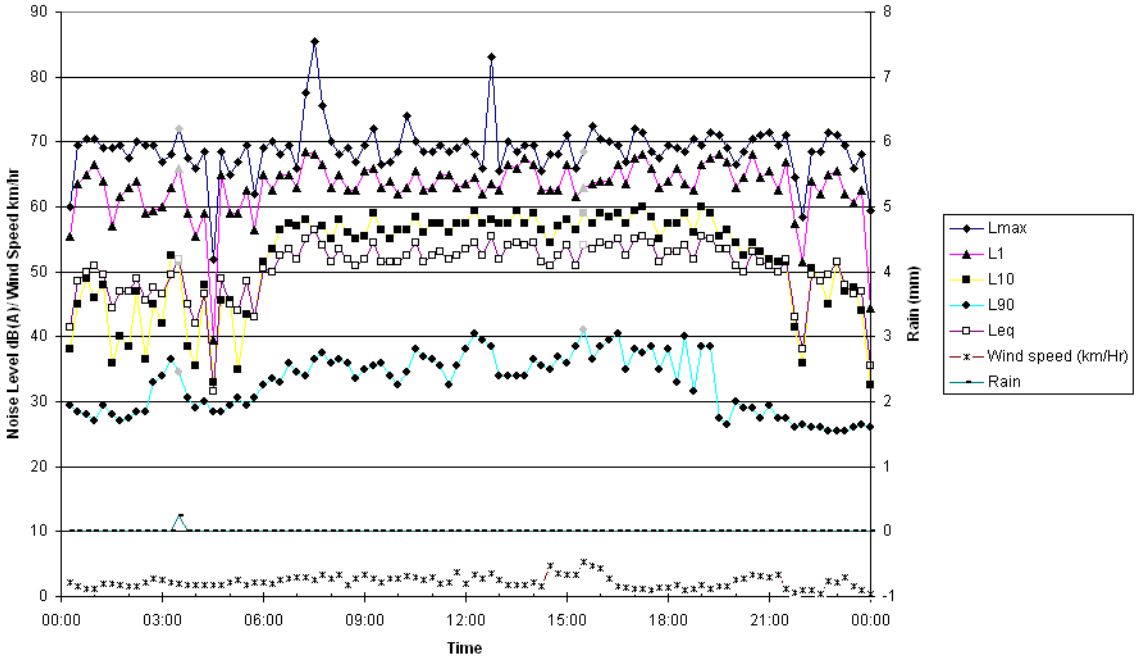
Measured Noise Levels
R3 - Beale - Monday 23/04/2012



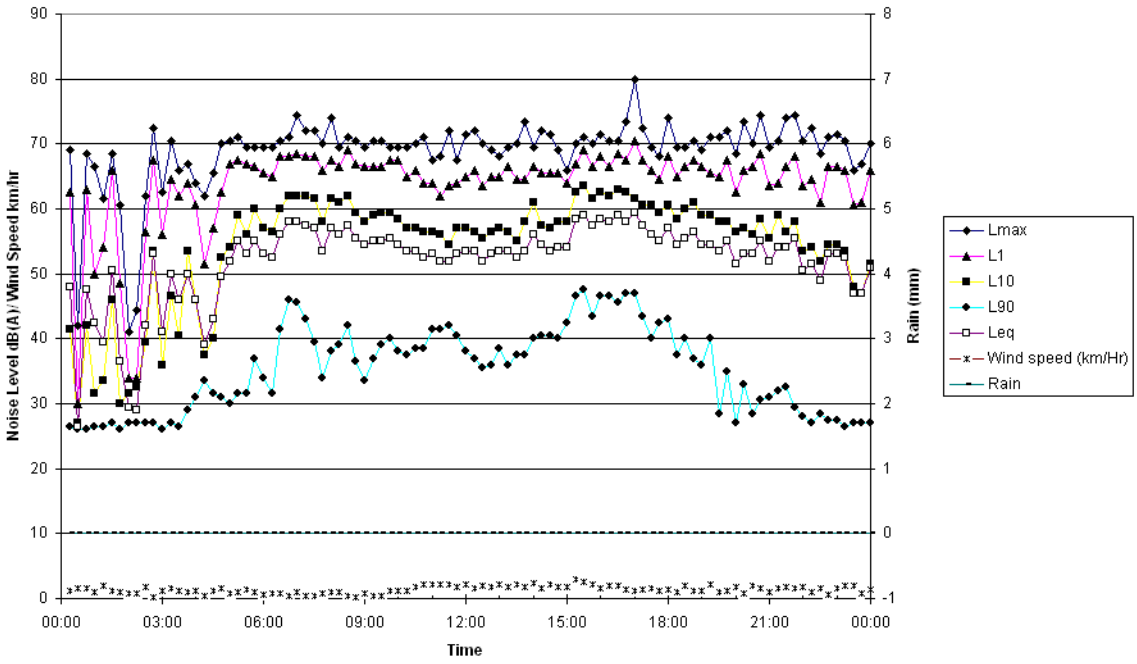
Measured Noise Levels
R3 - Beale - Tuesday 24/04/2012



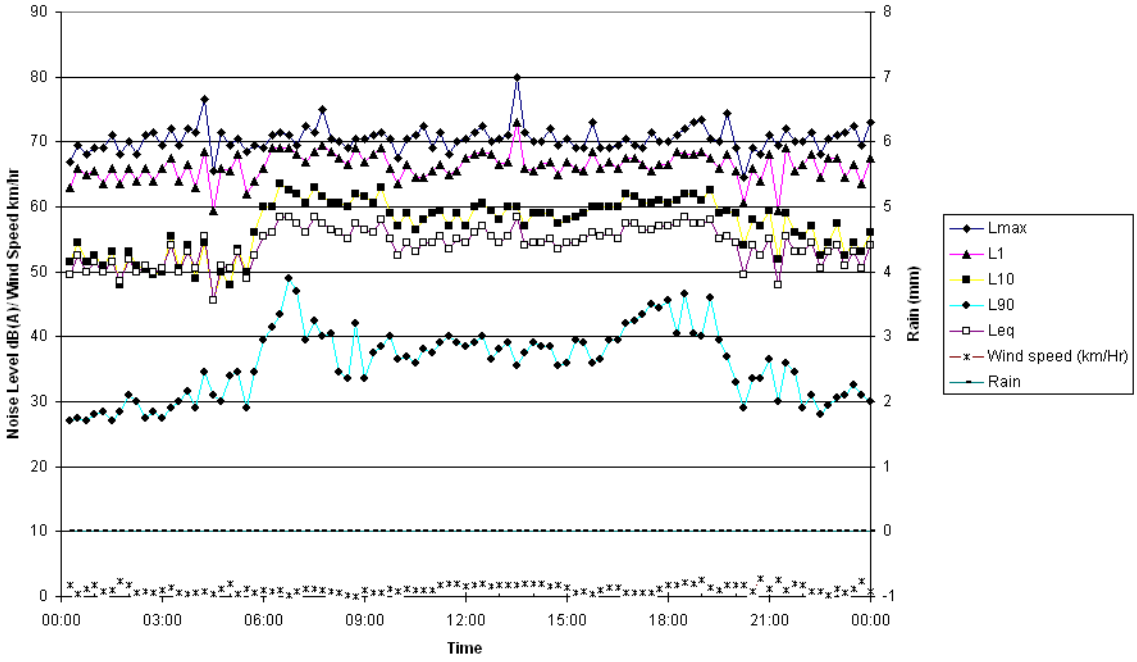
Measured Noise Levels
R3 - Beale - Wednesday 25/04/2012



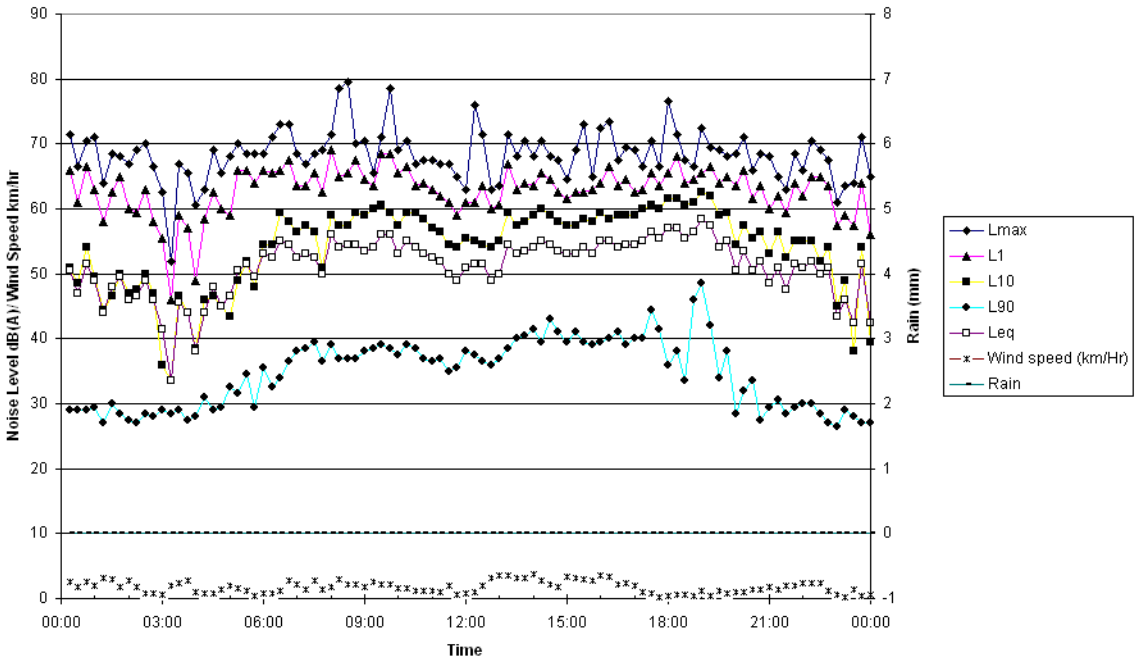
Measured Noise Levels
R3 - Beale - Thursday 26/04/2012



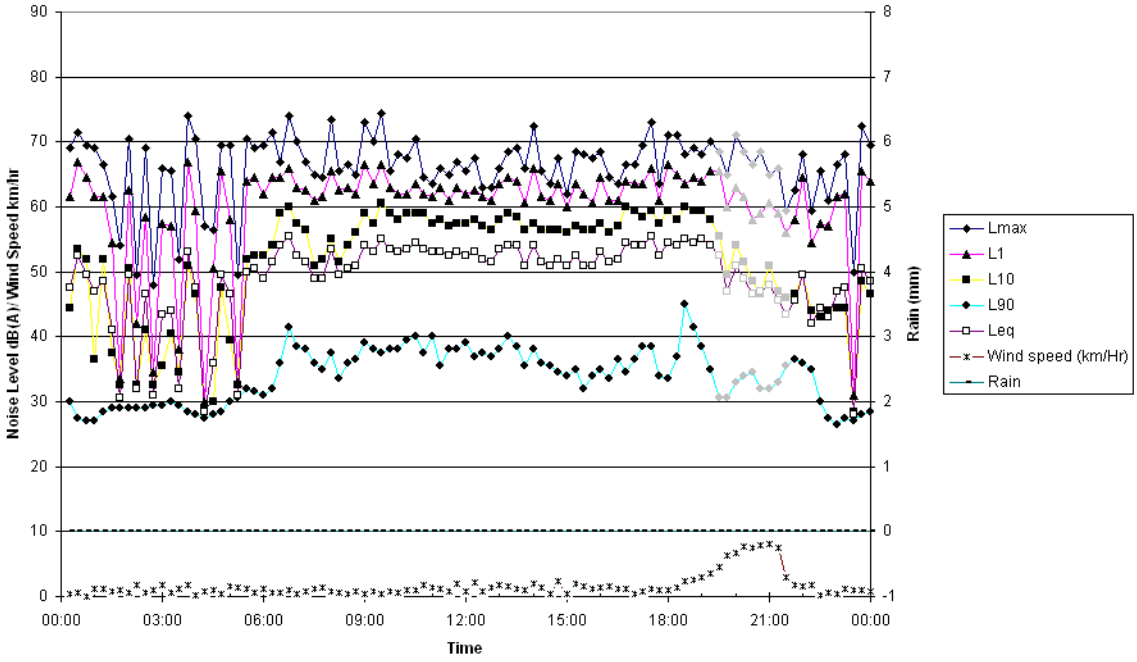
Measured Noise Levels
R3 - Beale - Friday 27/04/2012



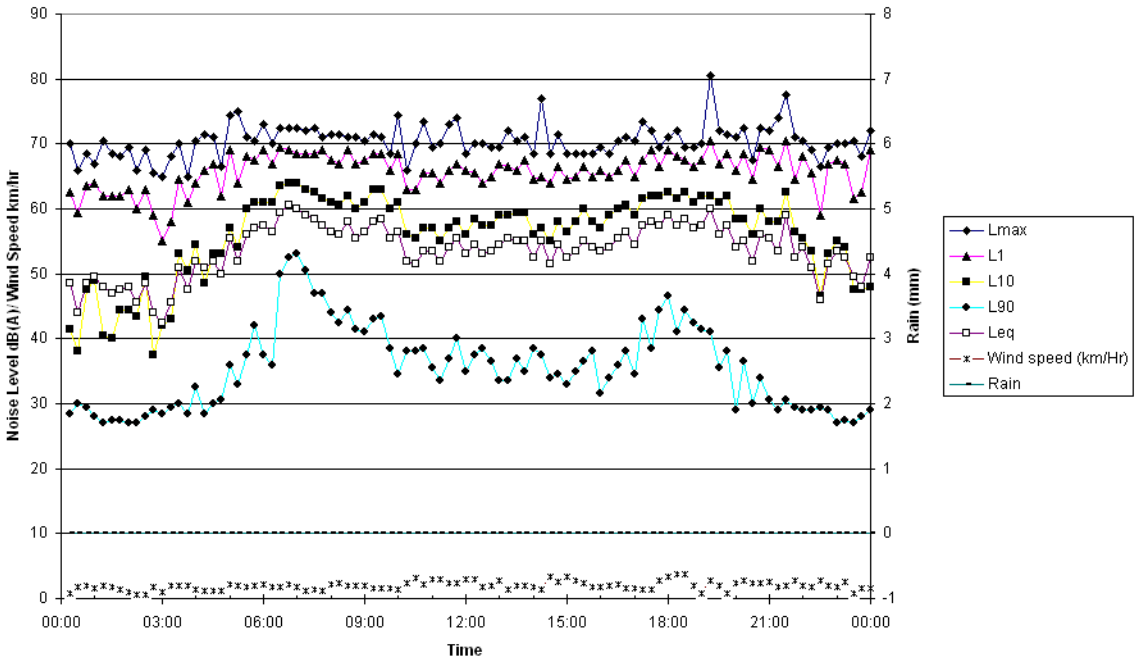
Measured Noise Levels
R3 - Beale - Saturday 28/04/2012



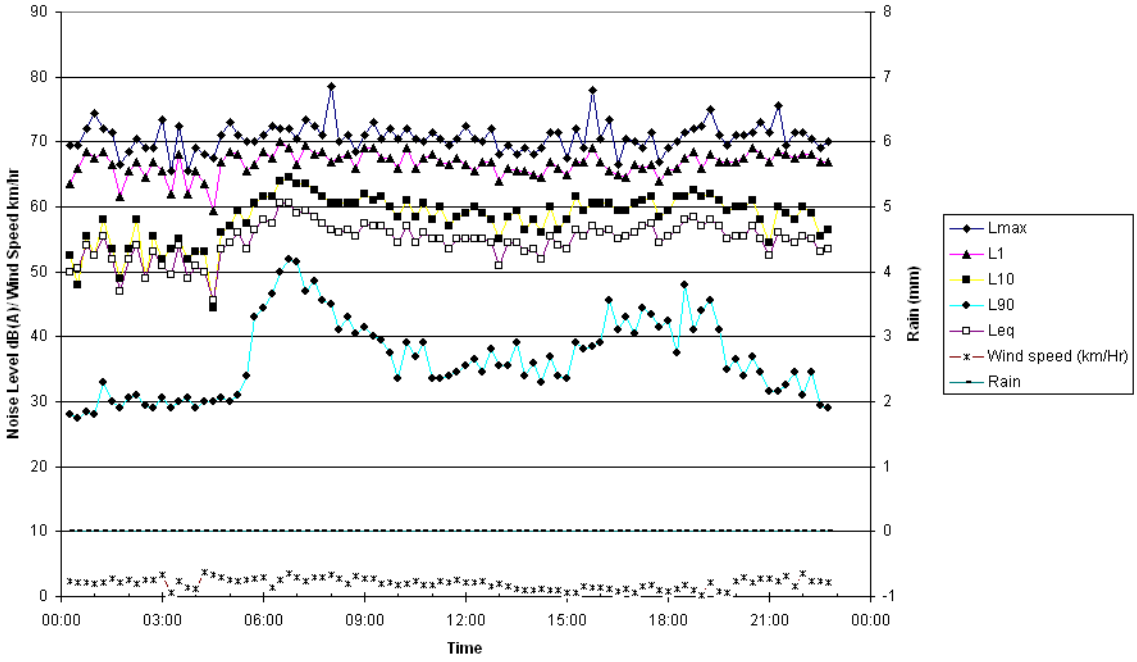
Measured Noise Levels
R3 - Beale - Sunday 29/04/2012



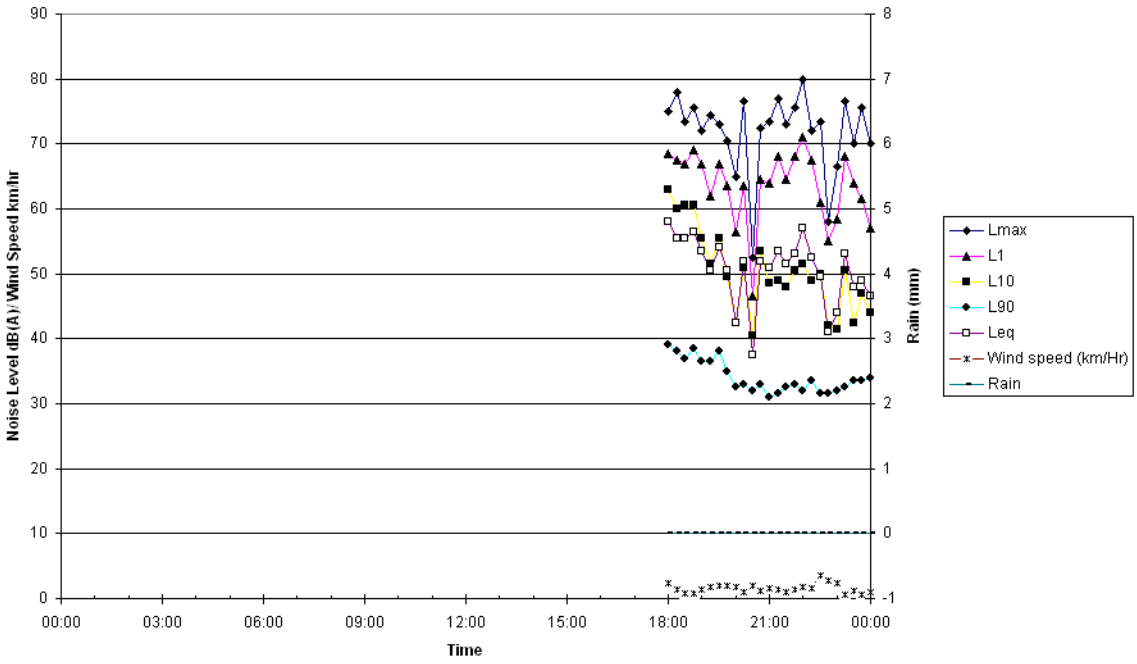
Measured Noise Levels
R3 - Beale - Monday 30/04/2012



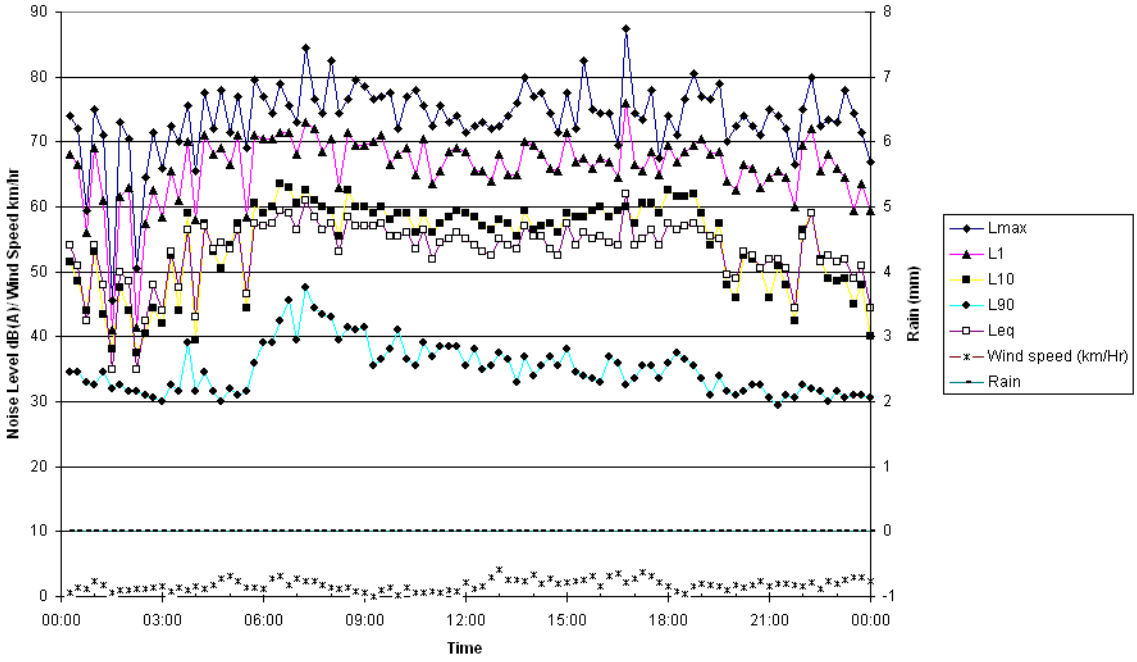
Measured Noise Levels
R3 - Beale - Tuesday 01/05/2012



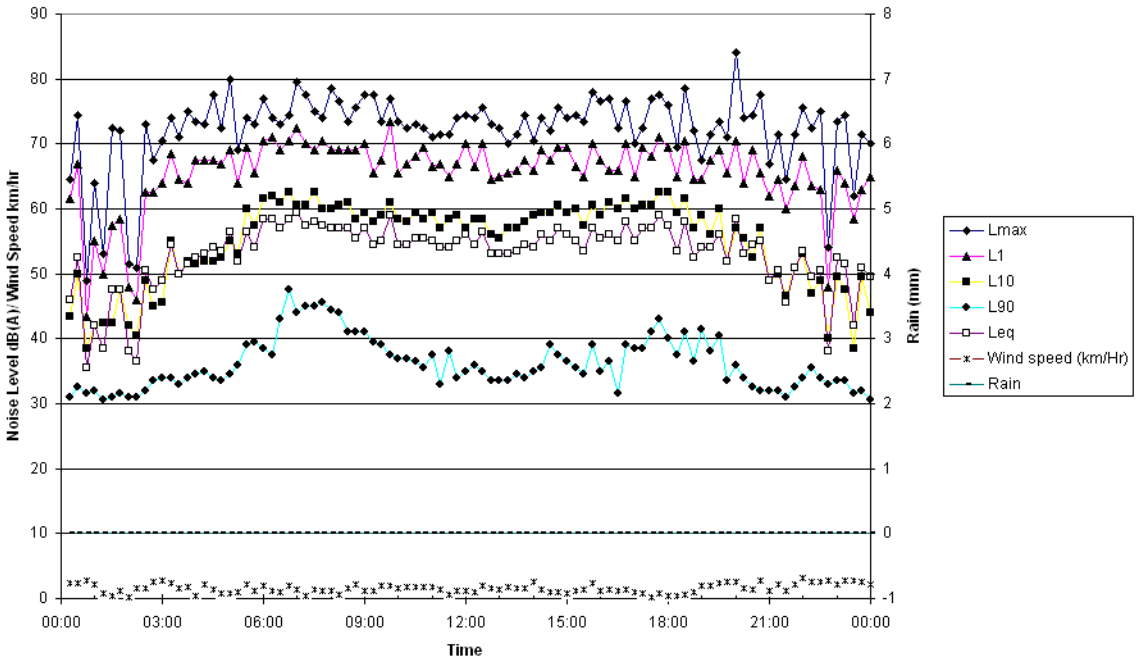
Measured Noise Levels
R4 - Batlow - Wednesday 11/04/2012



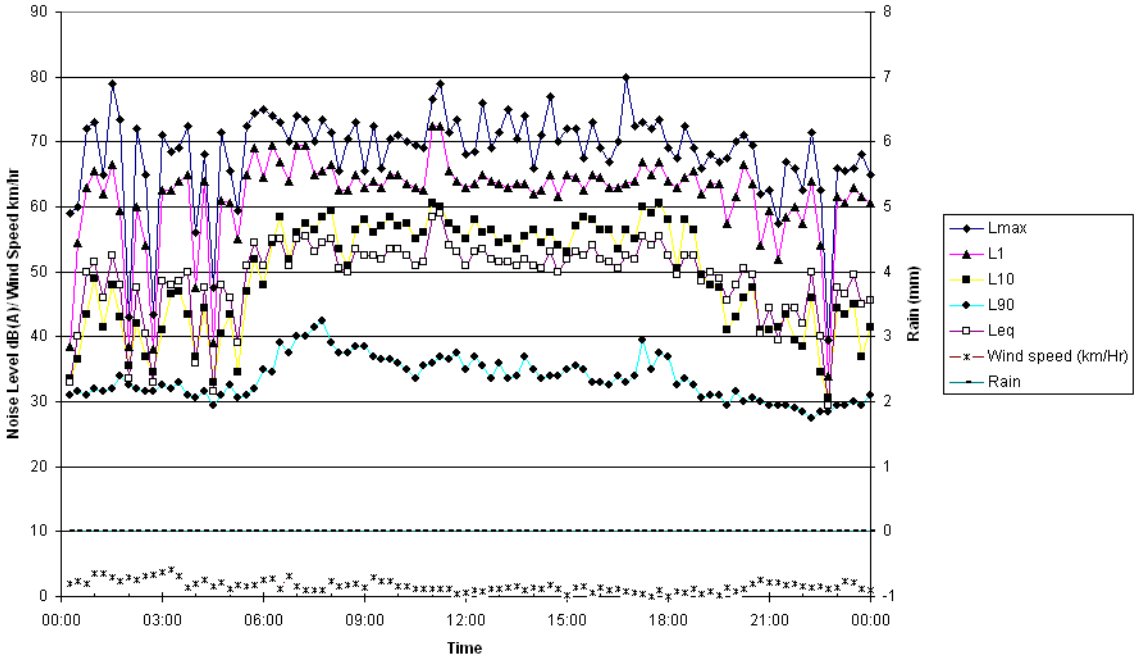
Measured Noise Levels
R4 - Batlow - Thursday 12/04/2012



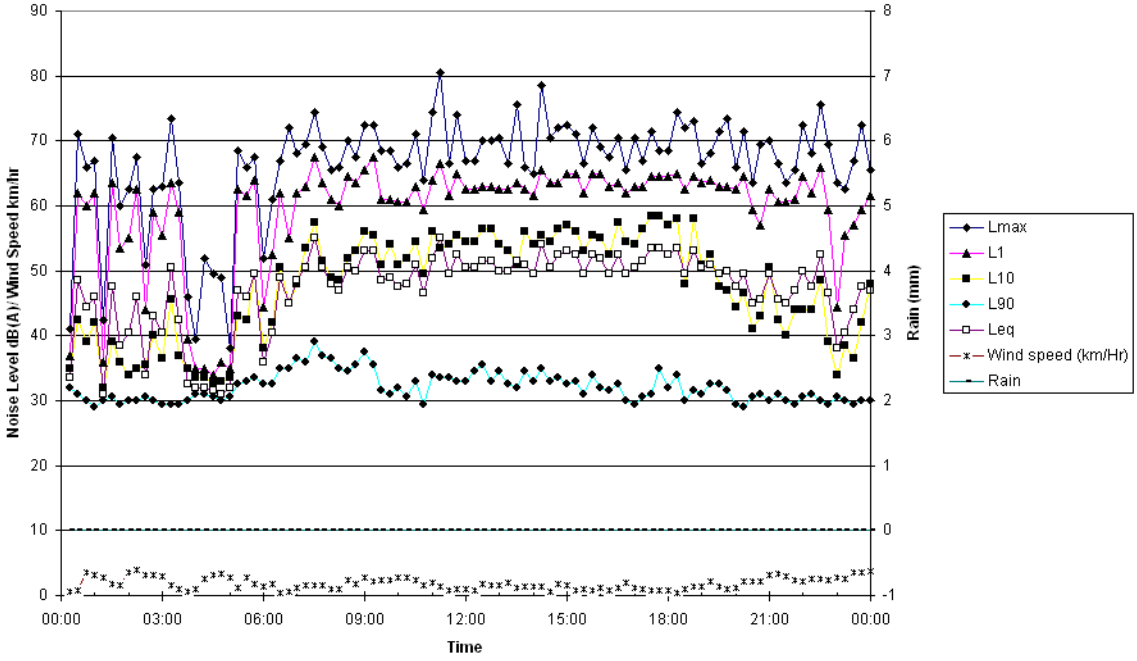
Measured Noise Levels
R4 - Batlow - Friday 13/04/2012



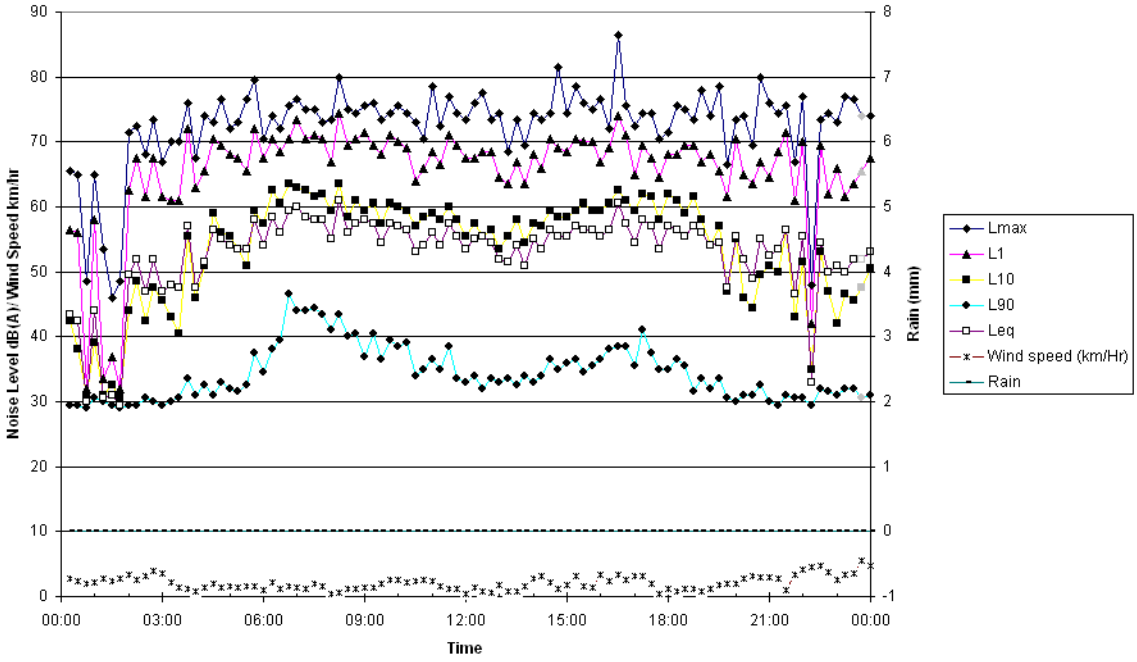
Measured Noise Levels
R4 - Batlow - Saturday 14/04/2012



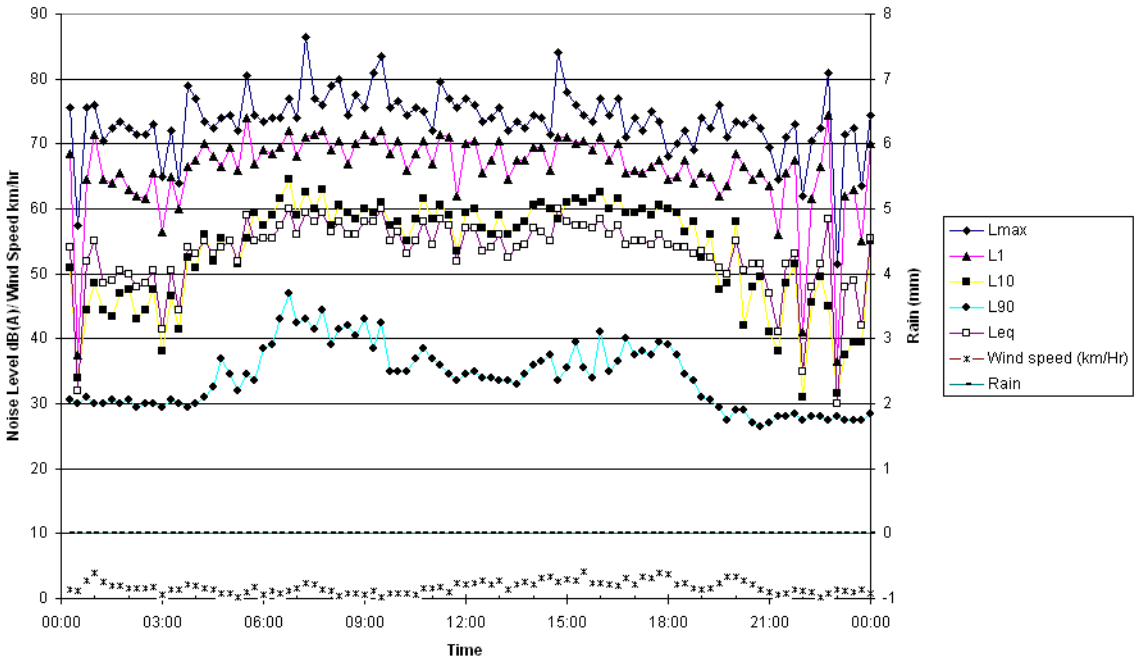
Measured Noise Levels
R4 - Batlow - Sunday 15/04/2012



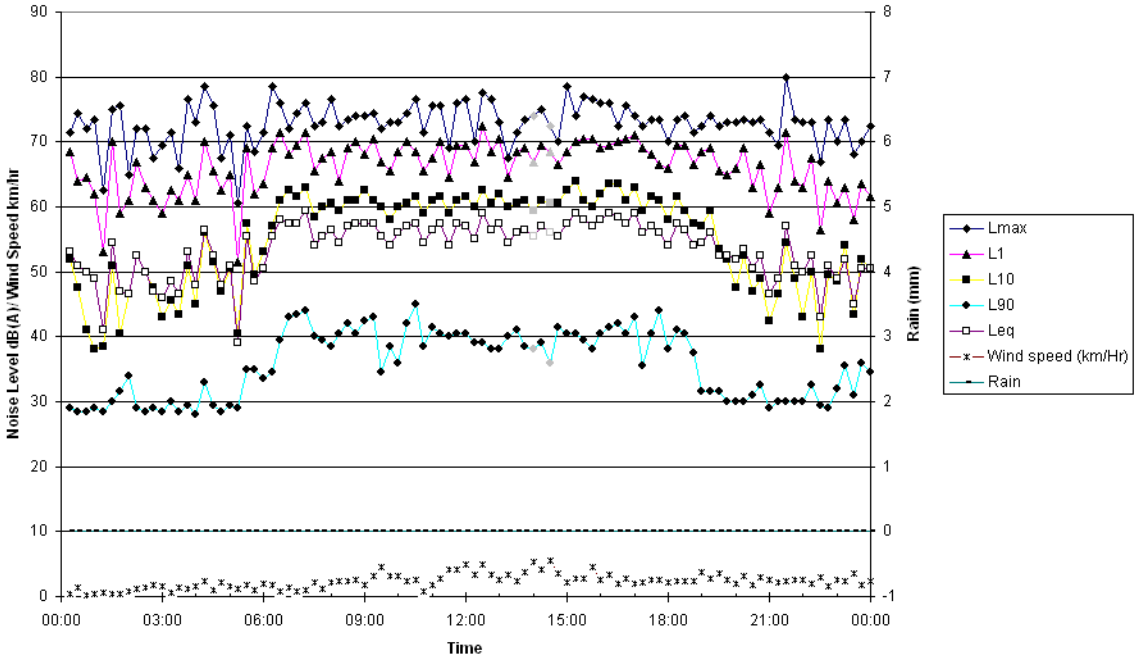
Measured Noise Levels
R4 - Batlow - Monday 16/04/2012



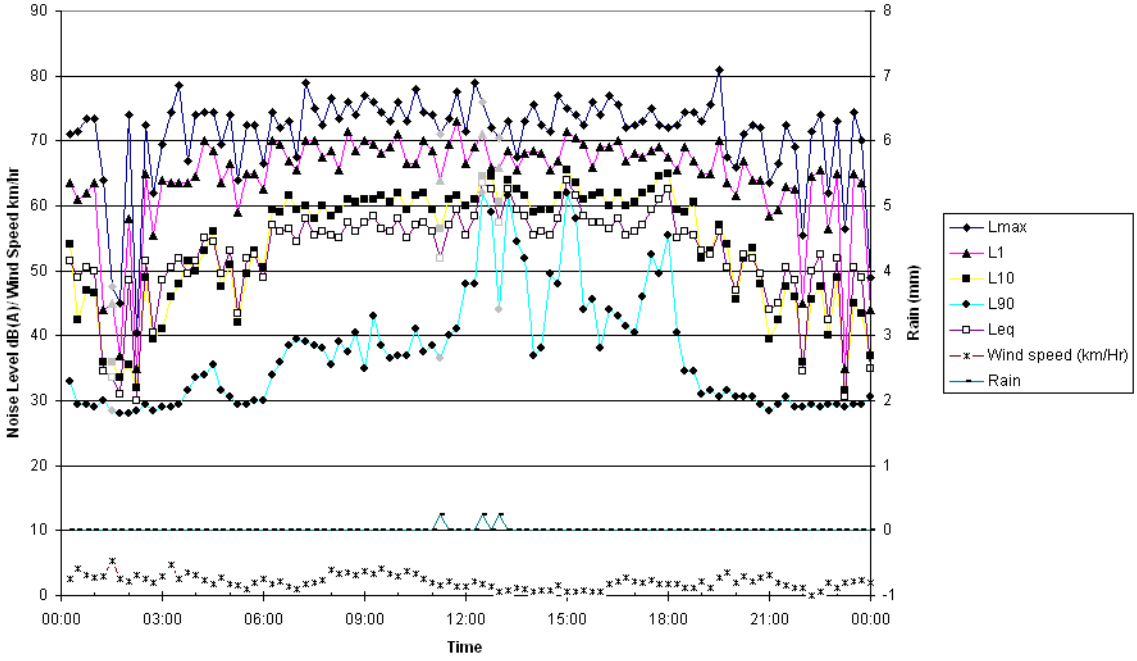
Measured Noise Levels
R4 - Batlow - Tuesday 17/04/2012



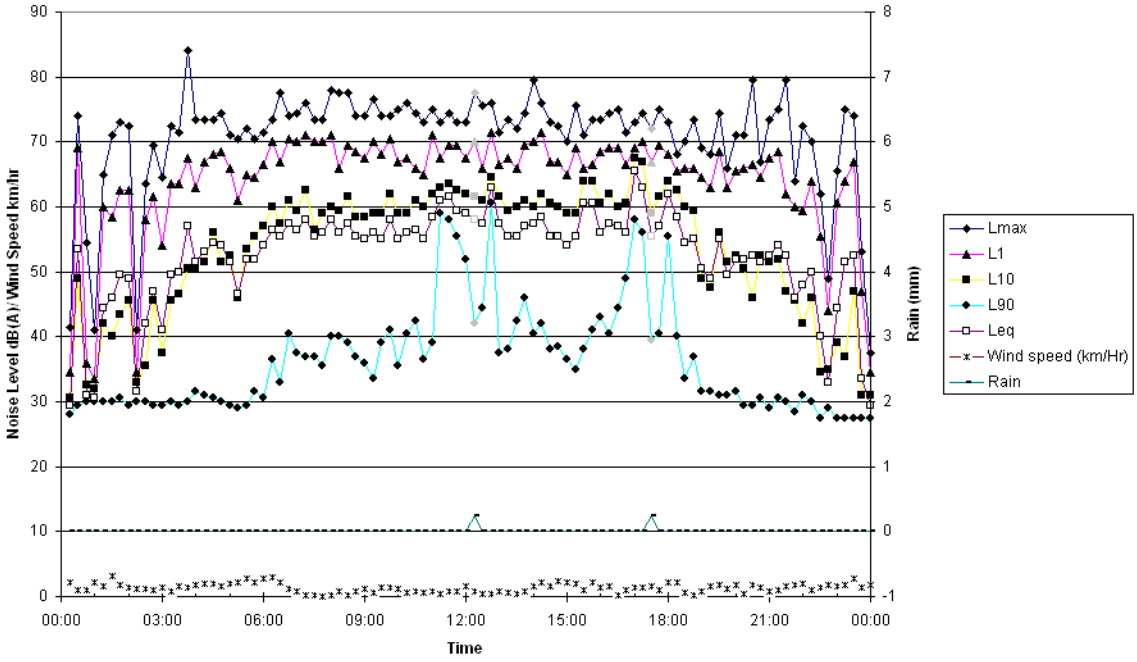
Measured Noise Levels
R4 - Batlow - Wednesday 18/04/2012



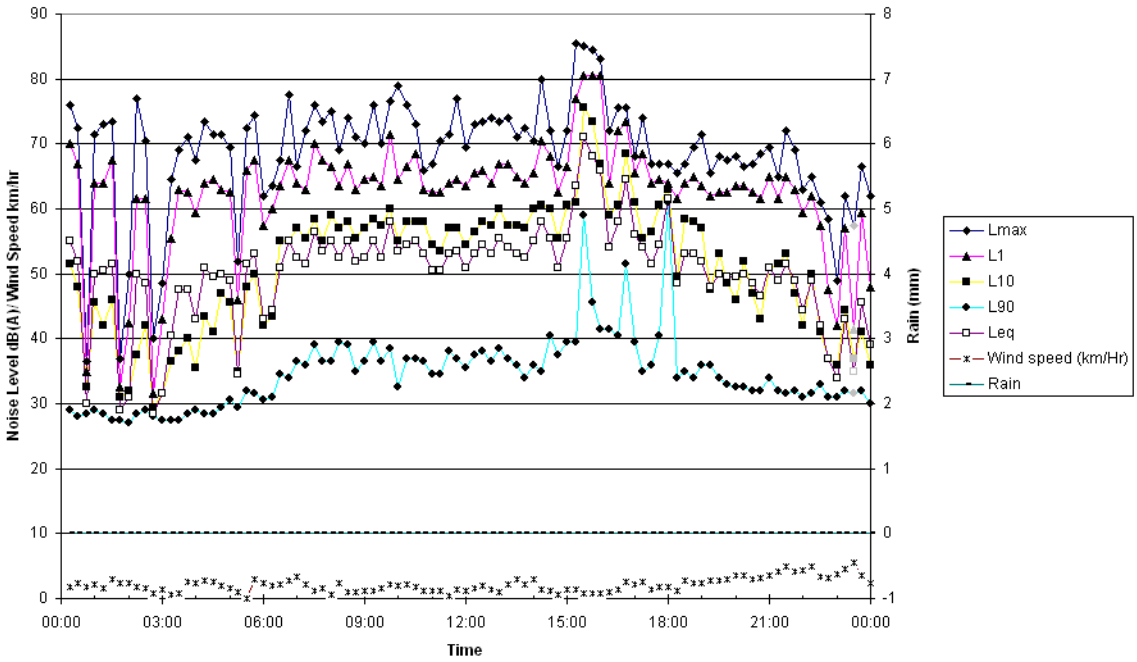
Measured Noise Levels
R4 - Batlow - Thursday 19/04/2012



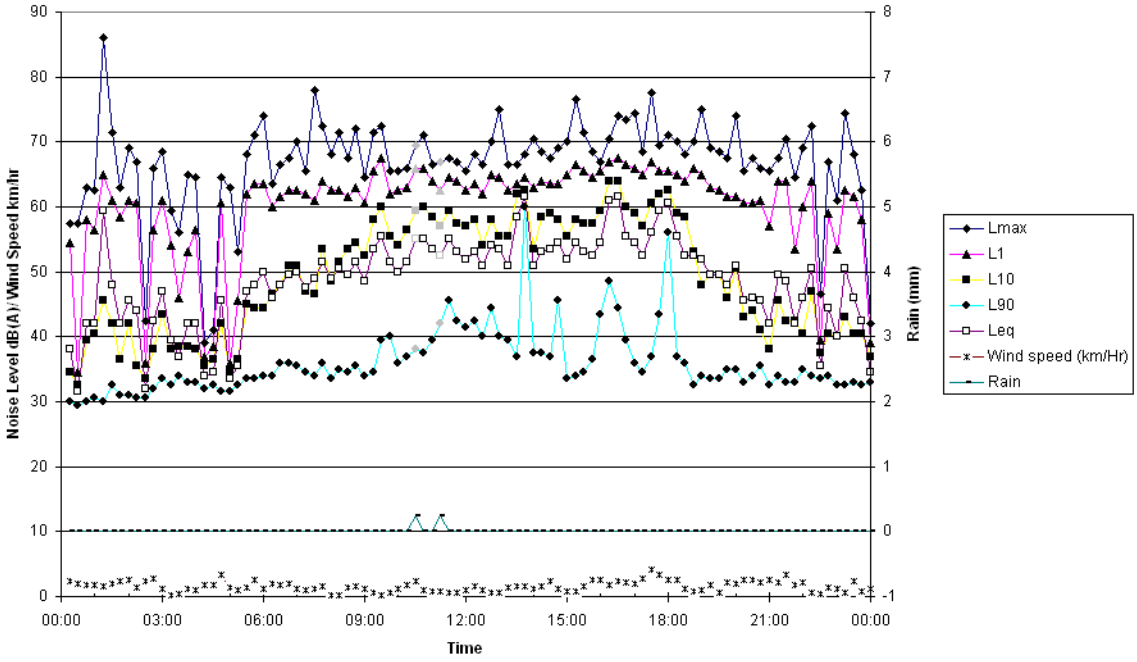
Measured Noise Levels
R4 - Batlow - Friday 20/04/2012



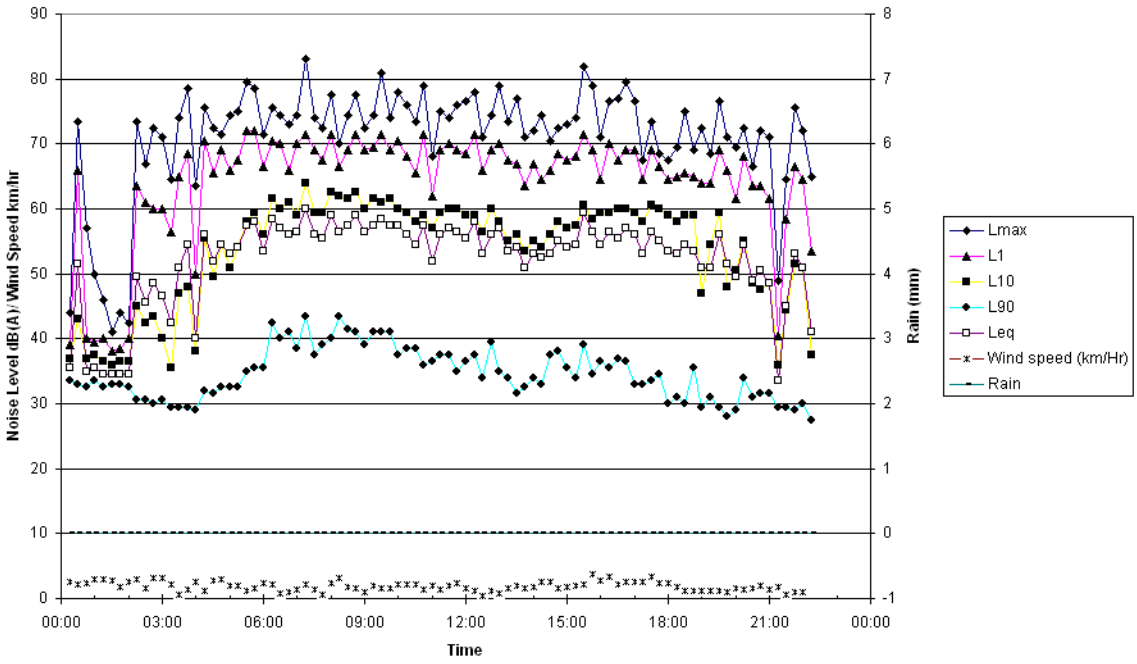
Measured Noise Levels
R4 - Batlow - Saturday 21/04/2012

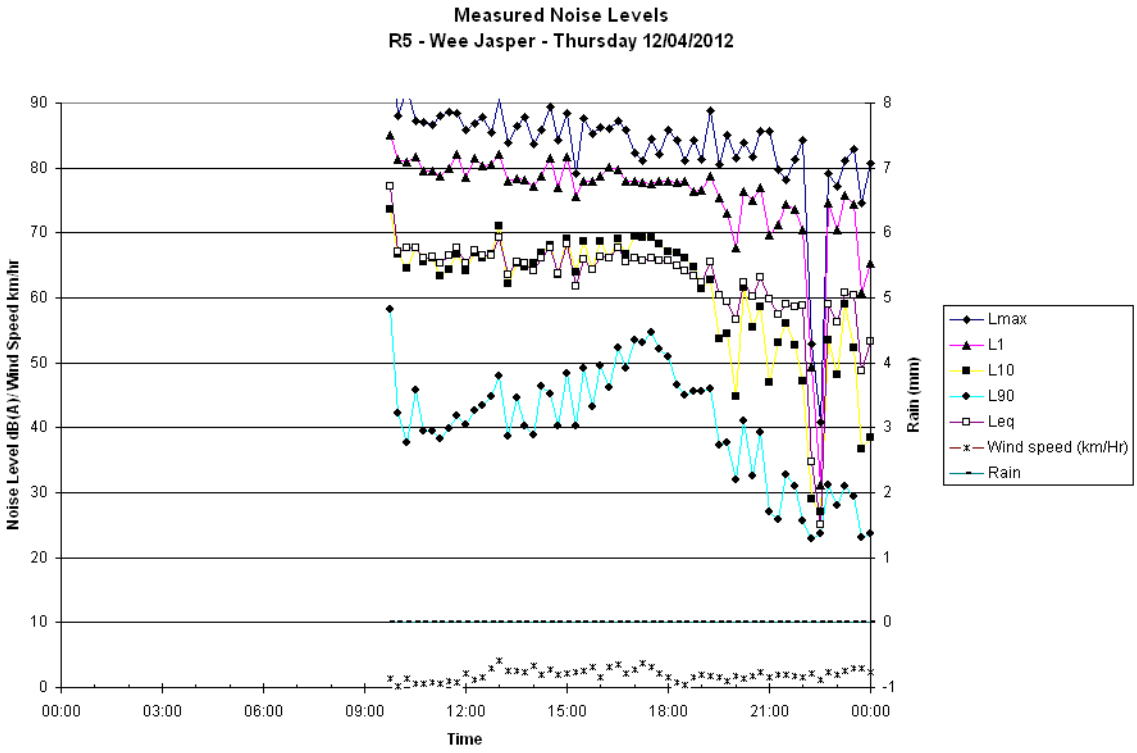


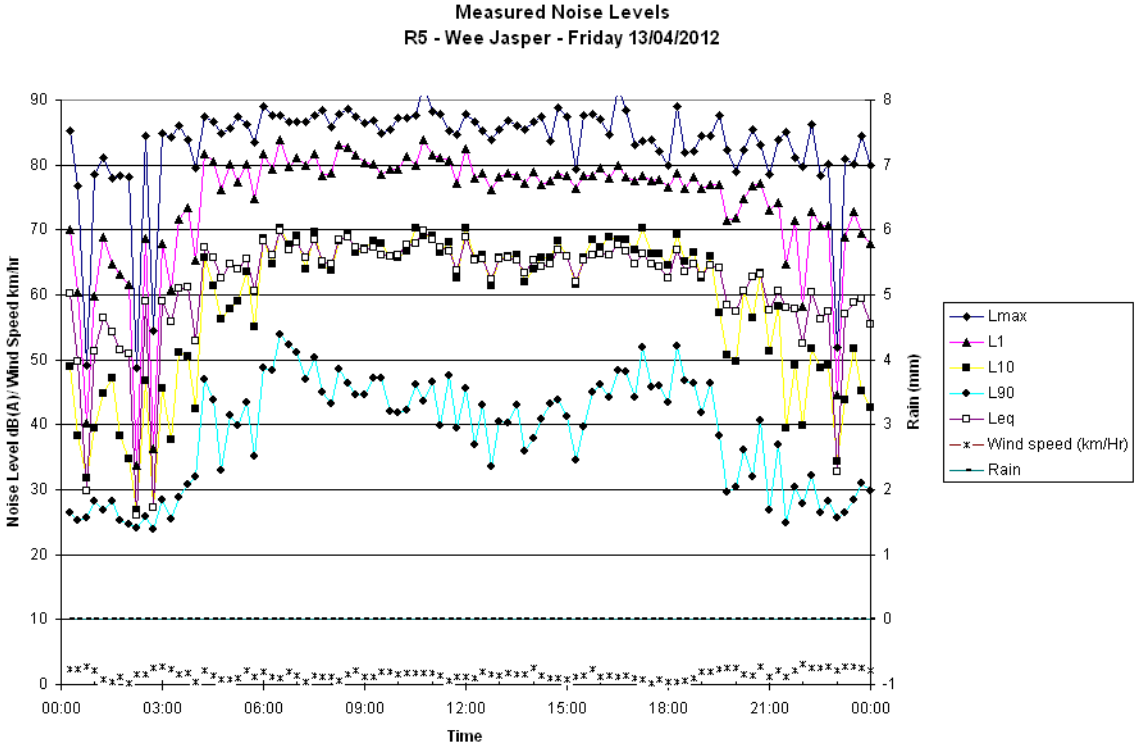
Measured Noise Levels
R4 - Batlow - Sunday 22/04/2012



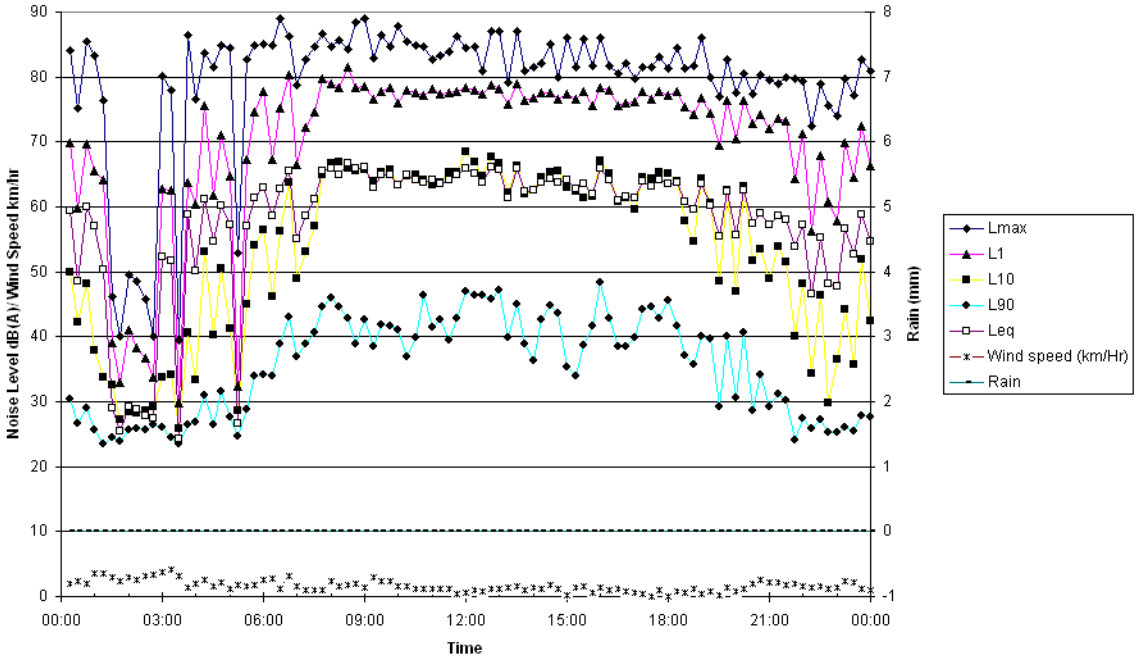
Measured Noise Levels
R4 - Batlow - Monday 23/04/2012



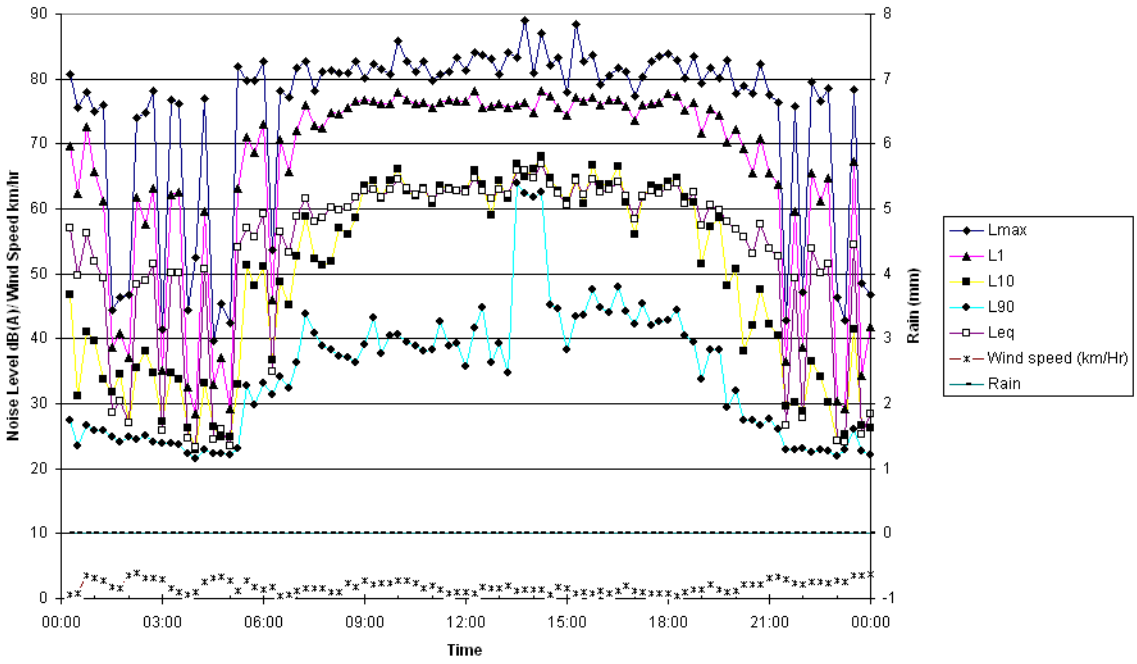

Measured Noise Levels
R5 - Wee Jasper - Thursday 12/04/2012
Noise Level dB(A) / Wind Speed km/hr
Rain (mm)
Time
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq
Wind speed (km/Hr)
Rain


Measured Noise Levels
R5 - Wee Jasper - Friday 13/04/2012
Noise Level dB(A) / Wind Speed km/hr
Rain (mm)
Time
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq
Wind speed (km/Hr)
Rain

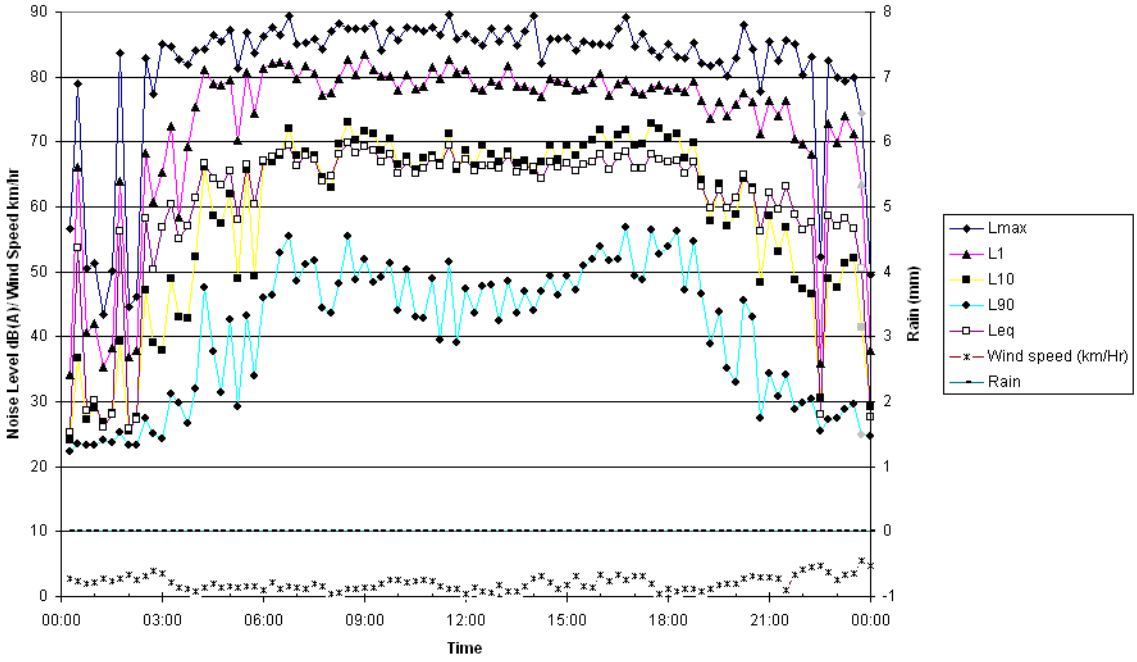
Measured Noise Levels
R5 - Wee Jasper - Saturday 14/04/2012



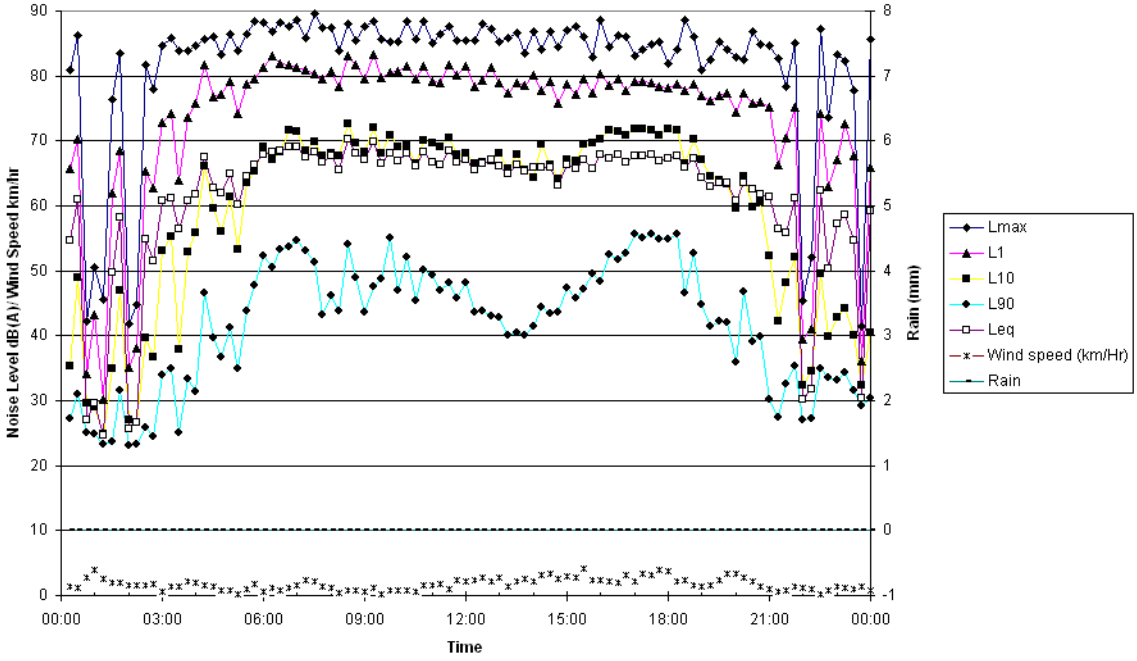
Measured Noise Levels
R5 - Wee Jasper - Sunday 15/04/2012



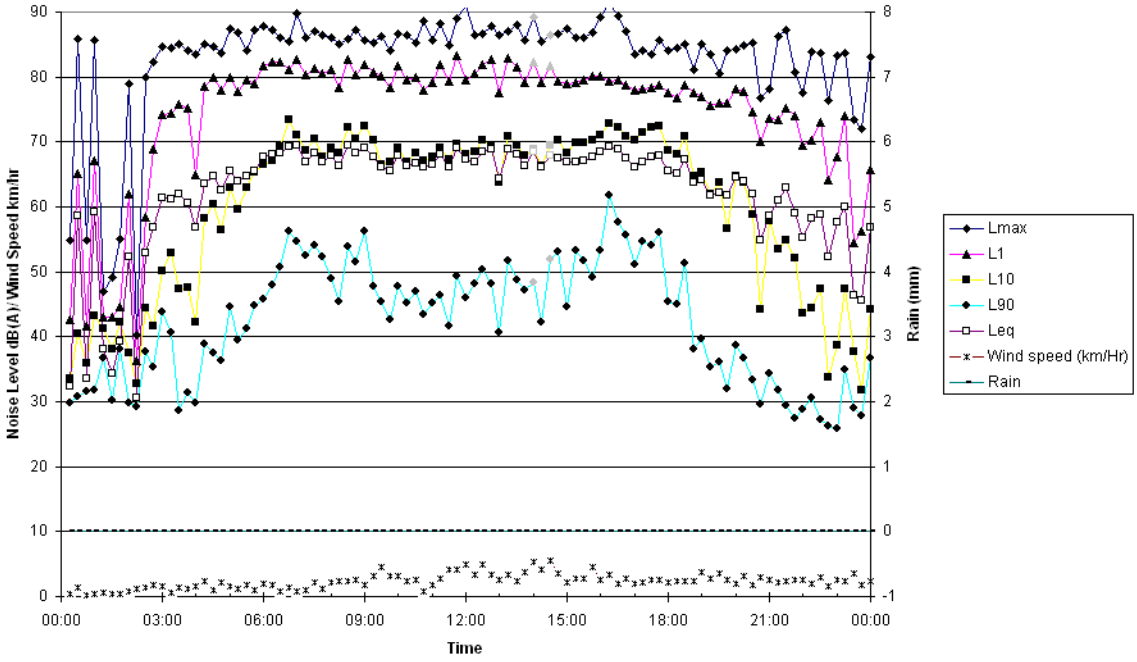
Measured Noise Levels
R5 - Wee Jasper - Monday 16/04/2012



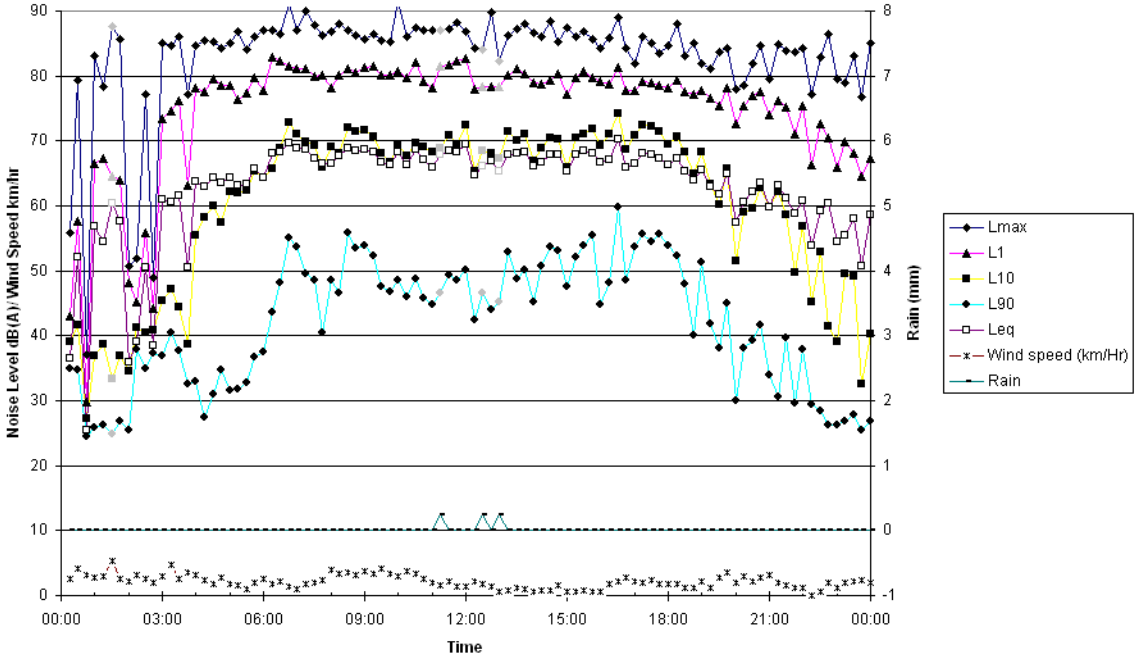
Measured Noise Levels
R5 - Wee Jasper - Tuesday 17/04/2012



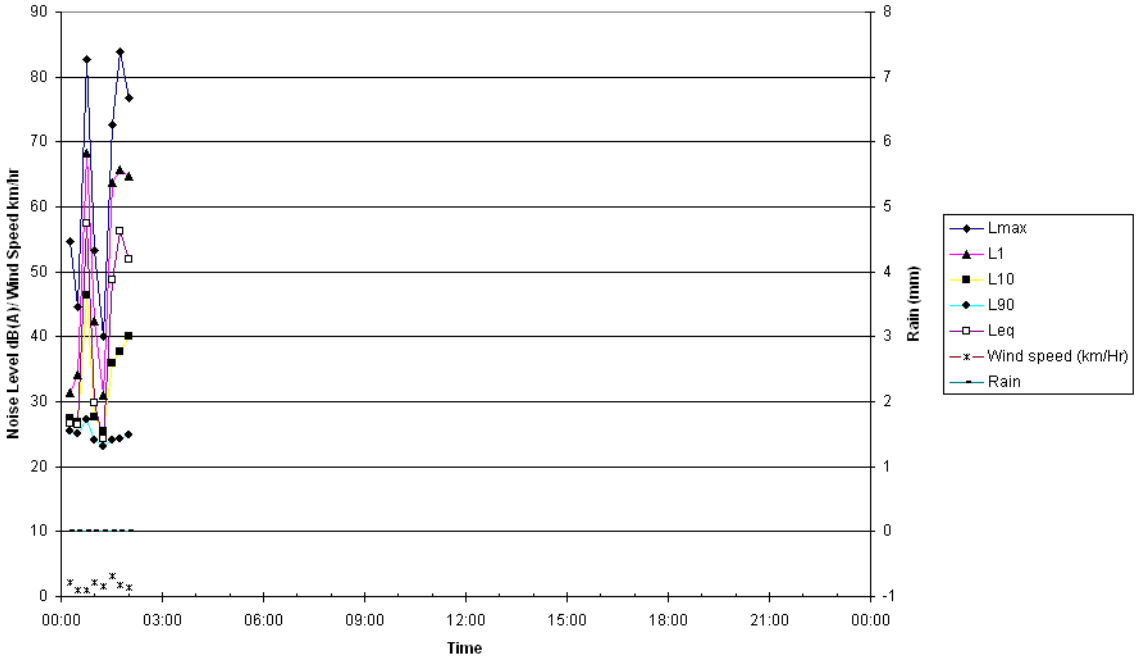
Measured Noise Levels
R5 - Wee Jasper - Wednesday 18/04/2012



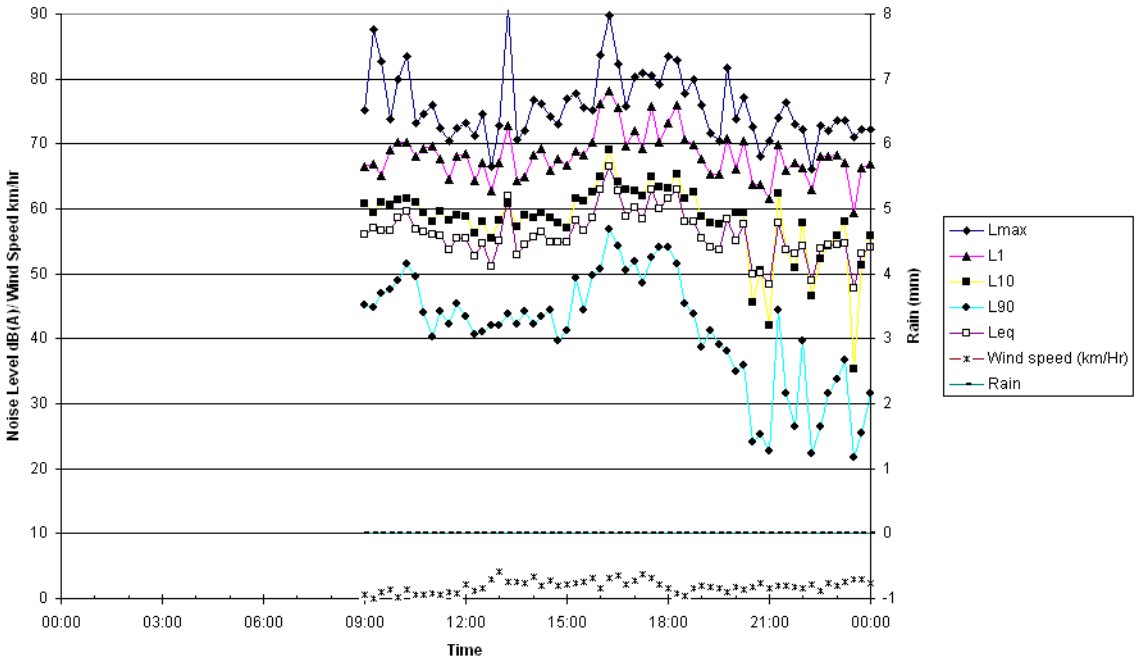
Measured Noise Levels
R5 - Wee Jasper - Thursday 19/04/2012



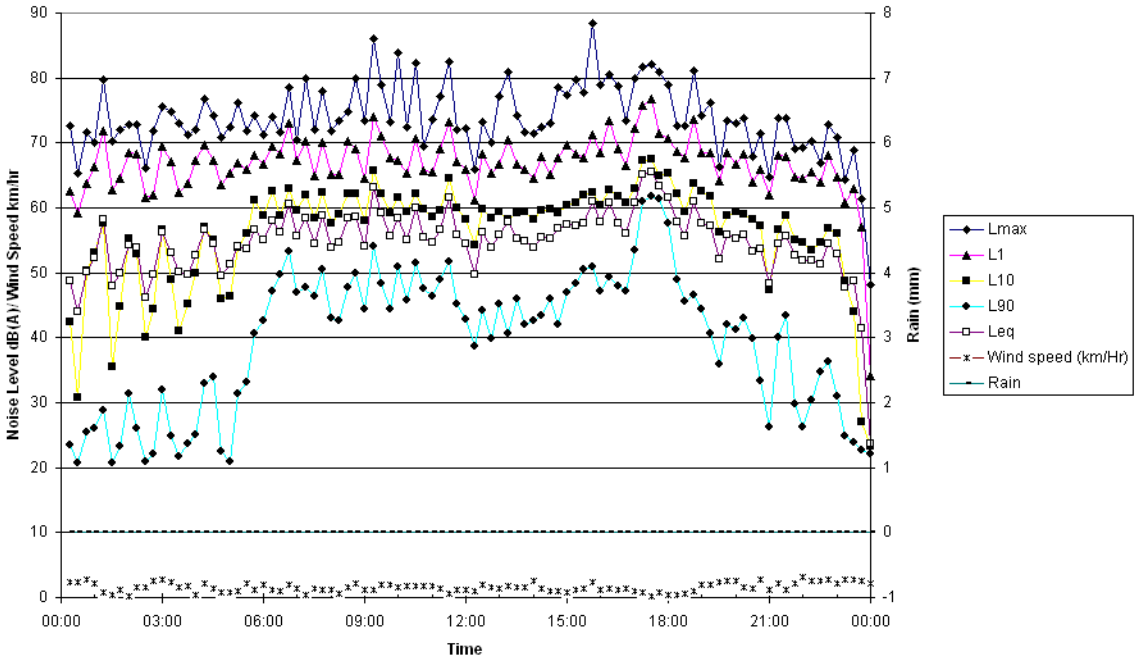
Measured Noise Levels
R5 - Wee Jasper - Friday 20/04/2012



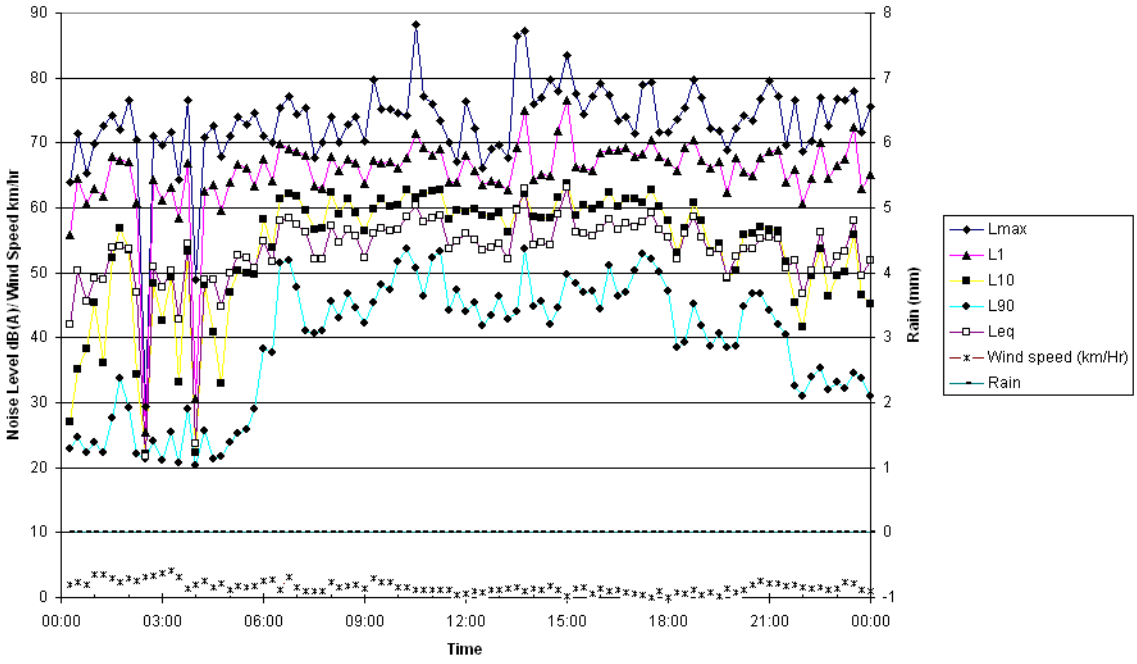
Measured Noise Levels
R7 - Minjary - Thursday 12/04/2012



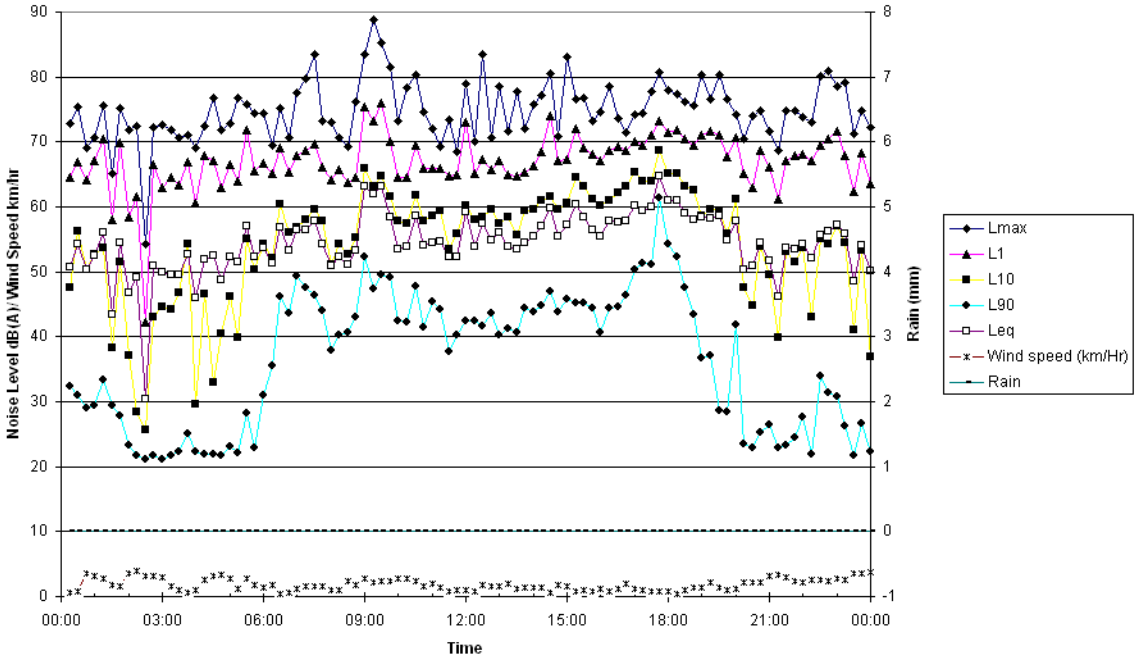
Measured Noise Levels
R7 - Minjary - Friday 13/04/2012



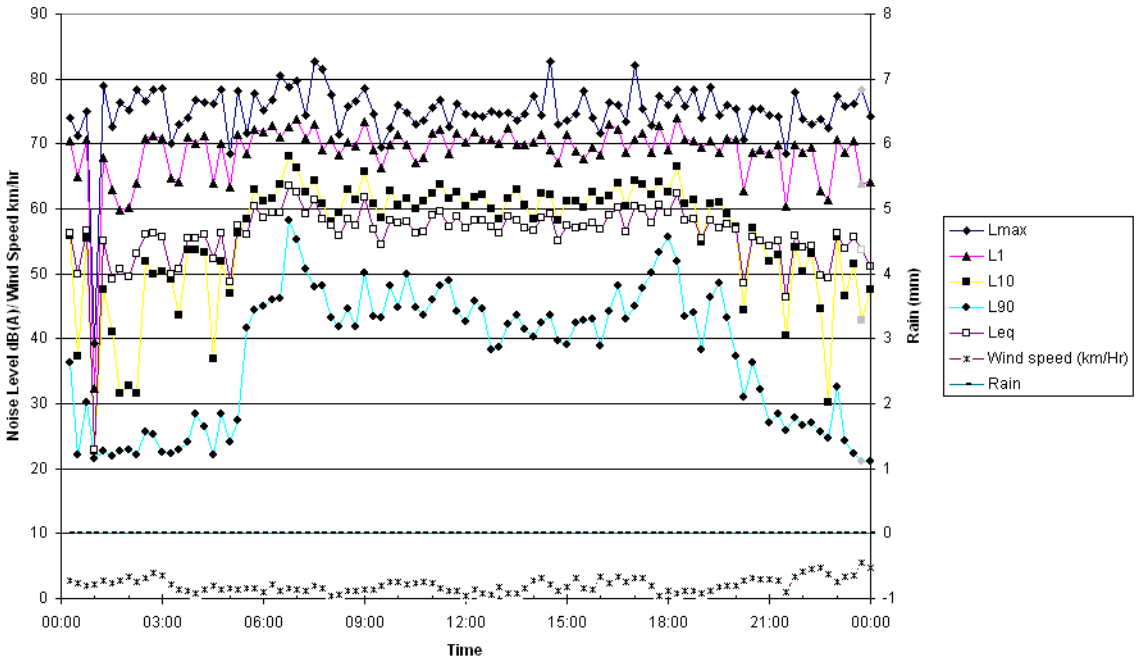
Measured Noise Levels
R7 - Minjary - Saturday 14/04/2012



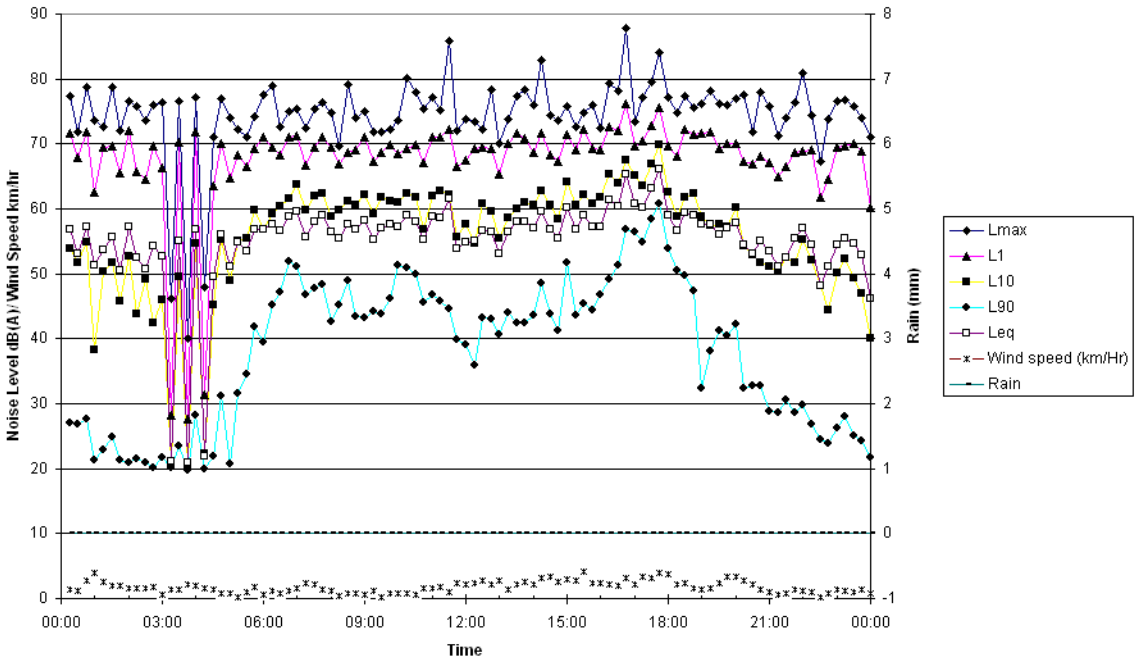
Measured Noise Levels
R7 - Minjary - Sunday 15/04/2012



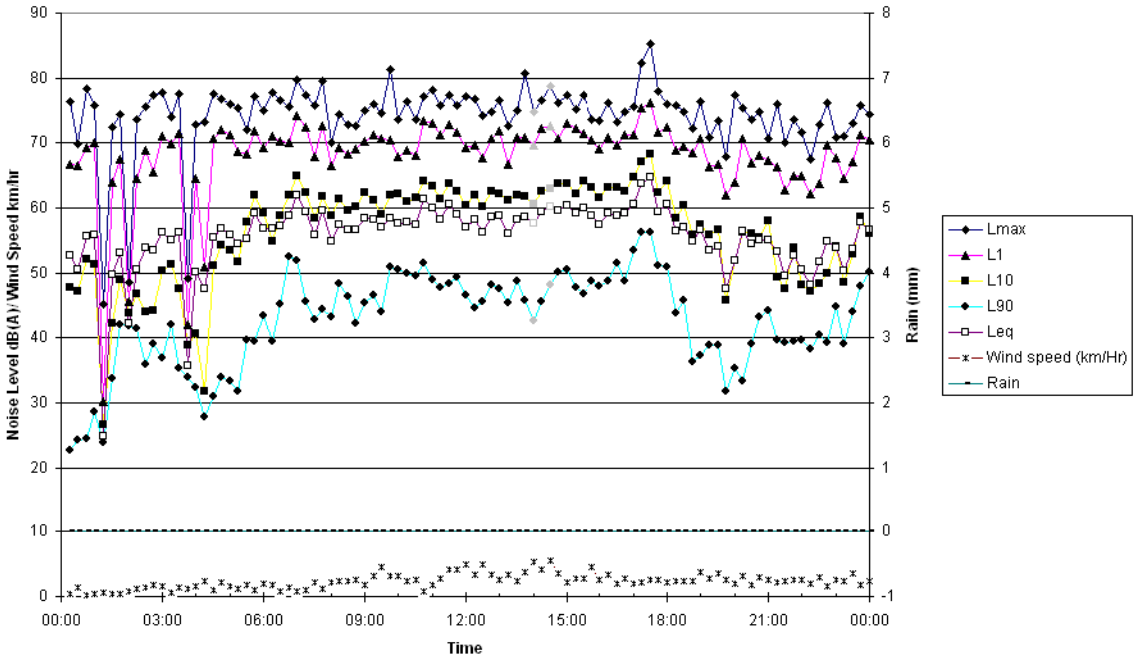
Measured Noise Levels
R7 - Minjary - Monday 16/04/2012



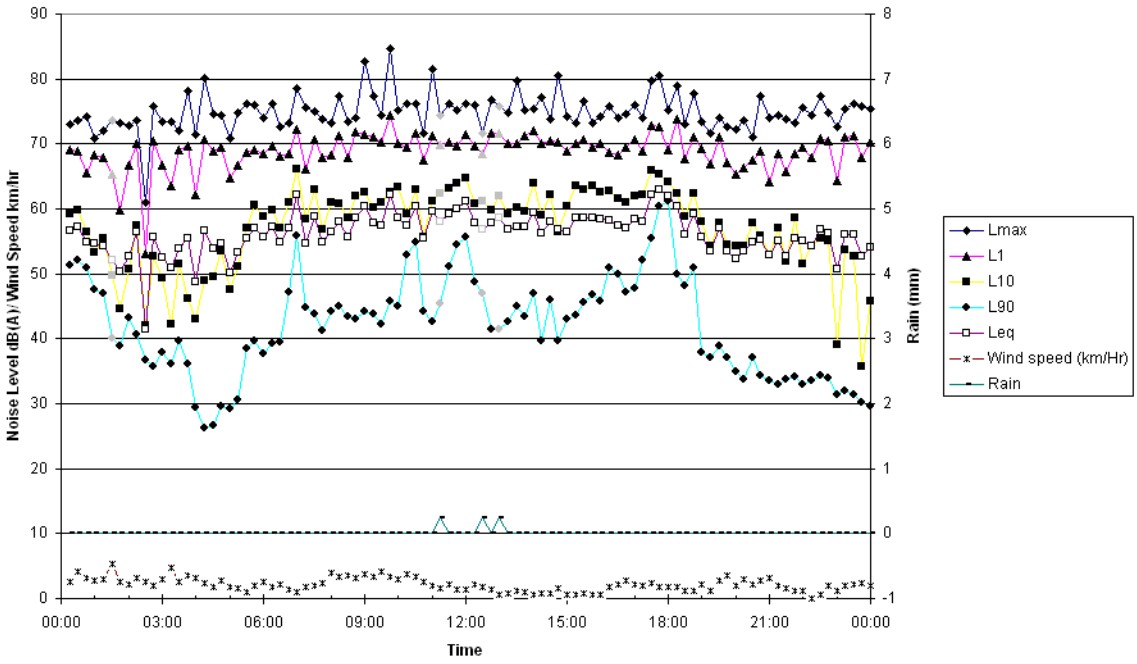
Measured Noise Levels
R7 - Minjary - Tuesday 17/04/2012



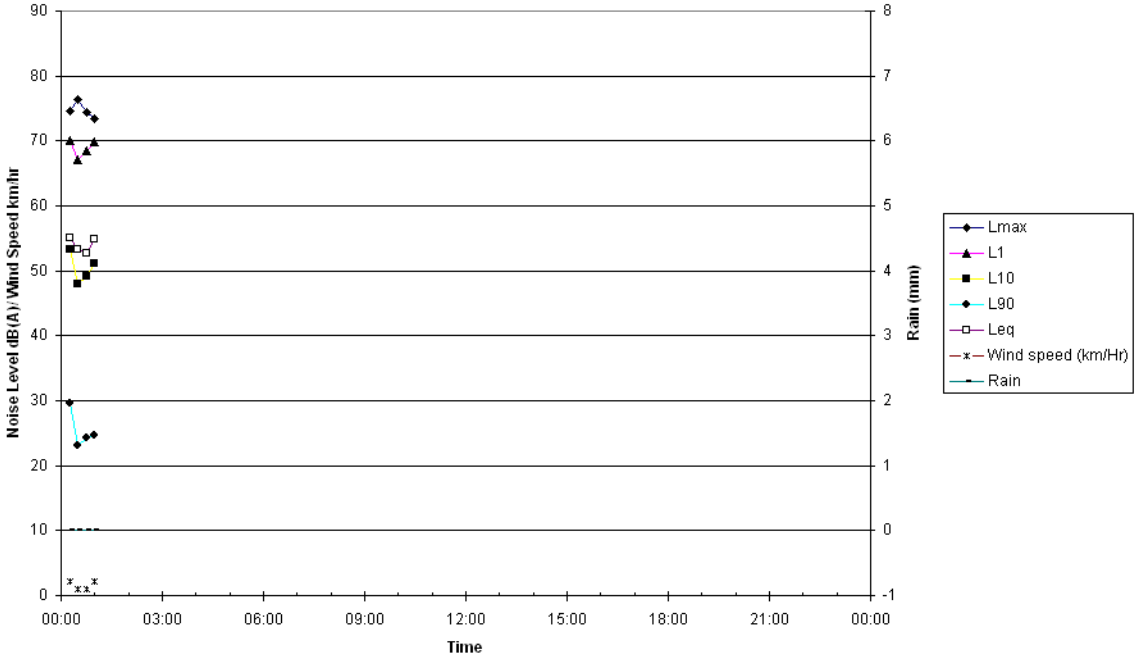
Measured Noise Levels
R7 - Minjary - Wednesday 18/04/2012



Measured Noise Levels
R7 - Minjary - Thursday 19/04/2012



Measured Noise Levels
R7 - Minjary - Friday 20/04/2012



CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 38288

Equipment Description:	Noise Logger		
Manufacturer:	ARL		
Model No:	EL-215	**Serial No:**	194702
Microphone Type:	Electret	**Serial No:**	194702
Filter Type:	-	**Serial No:**	-
Comments:	All tests passed for type 2.		
Owner:	Benbow Environmental 13 Daking Street North Parramatta NSW 2151		
Ambient Pressure:	1013 hPa ±1.5 hPa		
Temperature:	23 °C ±2° C	**Relative Humidity:**	31 %RH ±5% RH
Date of Calibration:	14/07/2011	**Issue Date:**	15/07/2011
Acu-Vib Test Procedure:	AVP05 (SLM) & AVP06 (Filters) if applicable		

CHECKED BY: ..... **AUTHORISED SIGNATORY:** .....
Jack Kielt

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Acoustic and Vibration Measurements

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HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02)96808233
Mobile: 0413 809806
web site: www.acu-vib.com.au

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: **SLM 38389**

Equipment Description:	Noise Logger		
Manufacturer:	ARL		
Model No:	EL-215	**Serial No:**	194682
Microphone Type:	Electret	**Serial No:**	194593
Filter Type:	-	**Serial No:**	-
Comments:	All tests passed for type 2.		
Owner:	Benbow Environmental 13 Daking Street North Parramatta NSW 2151		
Ambient Pressure:	1007 hPa ±1.5 hPa		
Temperature:	23 °C ±2° C	**Relative Humidity:**	67 %RH ±5% RH
Date of Calibration:	29/08/2011	**Issue Date:**	29/08/2011

Acu-Vib Test Procedure: AVP05 (SLM) & AVP06 (Filters) if applicable

CHECKED BY: ..... **AUTHORISED SIGNATORY:** .....

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CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: **SLM 38287**

Equipment Description:	Noise Logger		
Manufacturer:	ARL		
Model No:	EL-215	**Serial No:**	194552
Microphone Type:	Electret	**Serial No:**	194552
Filter Type:	-	**Serial No:**	-
Comments:	All tests passed for type 2.		
Owner:	Benbow Environmental 13 Daking Street North Parramatta NSW 2151		
Ambient Pressure:	1013 hPa ±1.5 hPa		
Temperature:	23 °C ±2° C	**Relative Humidity:**	31 %RH ±5% RH
Date of Calibration:	14/07/2011	**Issue Date:**	15/07/2011

Acu-Vib Test Procedure: AVP05 (SLM) & AVP06 (Filters) if applicable

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web site: www.acu-vib.com.au

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: **SLM 38289**

Equipment Description:	Noise Logger		
Manufacturer:	ARL		
Model No:	EL-215	**Serial No:**	194441
Microphone Type:	Electret	**Serial No:**	194441
Filter Type:	-	**Serial No:**	-
Comments:	All tests passed for type 2.		
Owner:	Benbow Environmental 13 Daking Street North Parramatta NSW 2151		
Ambient Pressure:	1013 hPa ±1.5 hPa		
Temperature:	23 °C ±2° C	**Relative Humidity:**	31 %RH ±5% RH
Date of Calibration:	14/07/2011	**Issue Date:**	15/07/2011
Acu-Vib Test Procedure:	AVP05 (SLM) & AVP06 (Filters) if applicable		

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Acoustic Research Laboratories
Proprietary Limited A.B.N. 47 050 100 804
Noise and Vibration Monitoring Instrumentation for Industry and the Environment

Sound Level Meter Test Report

Report Number : C11623

Date of Test : 2/12/2011

Report Issue Date : 5/12/2011

Equipment Tested/ Model Number: **Ngara S-Pack Sound Acqusition System**

Instrument Serial Number: 8780AE

Microphone Serial Number: 317855

Preamplifier Serial Number: 27982

Client Name : Benbow Environmental

13 Daking Street

North Parramatta NSW 2151

Contact Name : Daniel Albanese

Tested by : Adrian Walker

Approved Signatory :

Date : **5th December 2011**

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Telephone +61 2 9484 0800 ♦ Facsimile +61 2 9484 0884
www.acousticresearch.com.au

Acoustic Research Laboratories
Proprietary Limited A.B.N. 47 050 100 804
Noise and Vibration Monitoring Instrumentation for Industry and the Environment

Sound Level Meter Test Report

Report Number : C11622

Date of Test : 2/12/2011

Report Issue Date : 2/12/2011

Equipment Tested/ Model Number: **Ngara S-Pack Sound Acqusition Systen**

Instrument Serial Number: 8780AD

Microphone Serial Number: 317856

Preamplifier Serial Number: 27983

Client Name : Benbow Environmental

13 Daking Street

North Parramatta NSW 2151

Contact Name : Daniel Albanese

Tested by : Adrian Walker

Approved Signatory :

Date : **2nd December 2011**

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Telephone +61 2 9484 0800 ♦ Facsimile +61 2 9484 0884
www.acousticresearch.com.au

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: 11838

EQUIPMENT TESTED: Sound Level Calibrator

Manufacturer: Rion
Type No: NC-73 **Serial No:** 10186522
Owner: Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Tests Performed: Measured output sound pressure level was found to be:
Before adjustment: 93.97 dB re 20 uPa at 994.7 Hz THD< 1%.
After adjustment: 93.97 dB re 20 uPa at 994.7 Hz THD< 1%.

Uncertainty (at 95% c.l.) k=2: Output ±0.11dB
Freq. ±0.05 Hz

CONDITION OF TEST:

Ambient Pressure: 993 hPa ±1.5 hPa **Relative Humidity:** 66 % RH ±5% RH
Temperature: 23 °C ±2° C
Date of Calibration: 18/01/2011 **Issue Date:** 18/01/2011
Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2004
CHECKED BY: ..... **AUTHORISED SIGNATORY:** .....
Jack Kielt

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