

Appendix N1
Additional information
on noise levels and
characteristics, Happy
Valley

APPENDIX N1 ADDITIONAL INFORMATION ON NOISE LEVELS AND CHARACTERISATIONS, HAPPY VALLEY

1 ABOUT THIS DOCUMENT

This document is an appendix to the 2009 Happy Valley ERMP for the purpose of summarising Bemax data on ambient noise assessments and tonality.

2 AMBIENT NOISE MONITORING RESULTS

Existing ambient noise levels were assessed near Residence 2 (Lot 216, Brilliant Rd) according to EPA Guidance No. 8. Noise levels were logged continuously over a period of three weeks in January 2009, using an EL316 logger, with settings for sample periods of 15 minutes duration, and fast time weighting as per AS1055.1. Corresponding wind speed and direction data was obtained from a monitoring station on the boundary of the Gwindinup minesite, just over 1 km from Residence 2.

Results are summarised in Table 1. Higher background noise levels at night are a reflection of higher winds experienced in evenings and early morning as shown in the following plots of noise levels and corresponding wind data.

Table 1. Background noise levels near Residence 2.

TIME PERIOD	"L ₉₀ " of L _{AF90} levels (dB)
0700-1900 Mon – Sat	29.7
1900-2200 Mon – Sat & 0900-2200 Sun & PH	31.2
2200-0700 Mon – Sat & 2200-0900 Sun & PH	34.6

3 CHARACTERISATION OF MINESITE NOISE IMISSIONS, GWINDINUP

Bemax reviewed data from existing monitoring equipment at the boundary of the Gwindinup minesite. Night time mining operations have been occurring between 1000 and 1500m from this location, with daytime construction activities as close as 400m. Hence this data is more likely to represent "as received" noise than recordings made close to machinery. In addition to recording sound levels, this equipment records third octave band frequency distributions over 15 minute intervals, and makes audible recordings on a level trigger. Assessments of tonality were made on the third octave L_{Aeq 15 min} levels (difference of more than 3dB from average of adjacent third octave bands).

The data set was reviewed to select a number of night time intervals where the L_{AS10} was between 30 and 38 dB for the 15 minute interval, and loader &/or trommel noise was audible in recordings. In most cases there were no tonal components present, or if present, the frequency did not match the emission spectrum of reference mining equipment (Table 2).

Similar assessments were made during daytime recordings, with tonal frequencies matching machinery emissions present in some recordings, but not in others (Table 3).

Table 2 Assessment of tonality of nighttime recordings

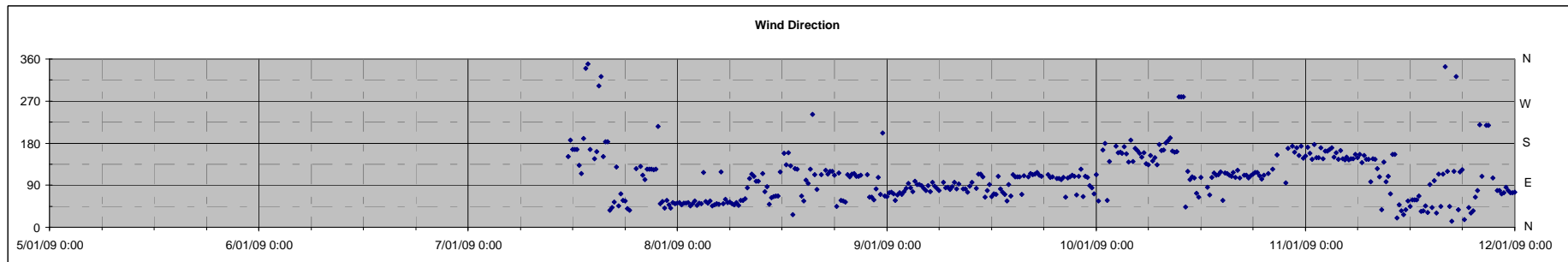
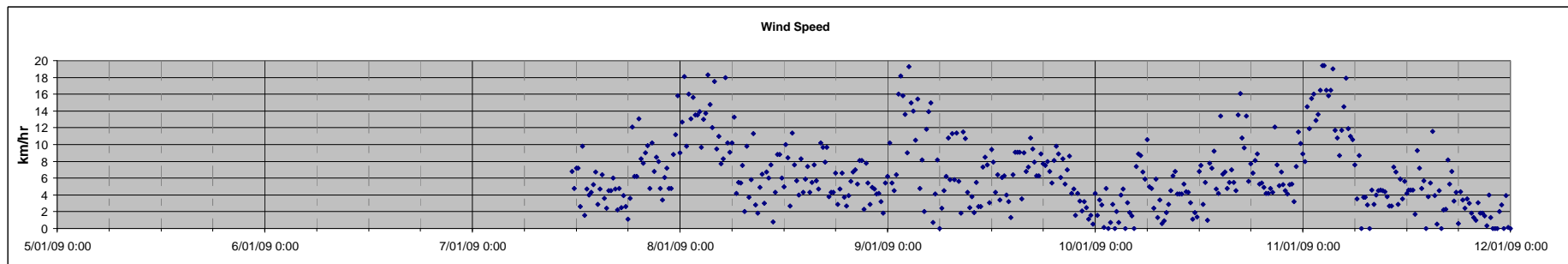
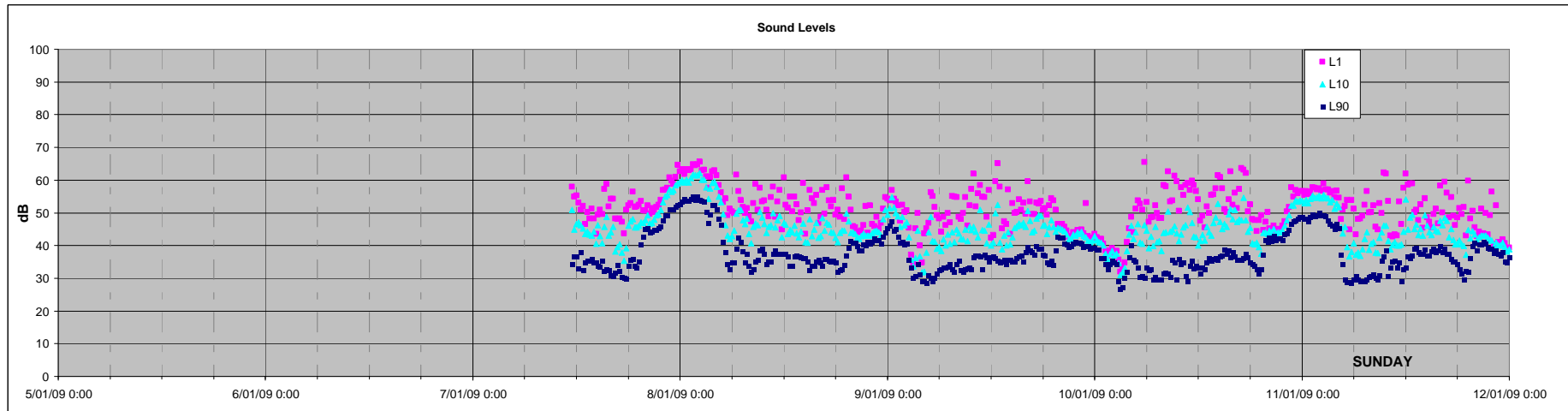
Reference equipment – Cat 980H loader – tonal at 80Hz						
Date	Time (WST)	Distance to mine activity	Wind	L _{AS10} (dB)	Recorded audible noise	Tonal frequencies
09/05/08	01:15 – 01:30	Approx. 1400-1500 m	n.d.	35.3	Loader, trommel, ducks	Nil
	01:30 – 01:45		n.d.	35.5	Loader, trommel, ducks	Nil
	01:45 – 02:00		n.d.	34.3	Loader, trommel	Nil
15/05/08	00:00 – 00:15		<0.5 m/s	37.2	Loader, trommel	Nil
	00:15 – 00:30		<0.5 m/s	37.9	Loader, trommel, cattle bellowing	Nil
	01:00 – 01:15		1.3 m/s 13°	35.8	Loader, trommel	250Hz
	01:30 – 01:45		0.7 m/s 21°	35.8	Loader, trommel	250Hz
17/05/08	03:30 – 03:45		<0.5 m/s	35.6	Trommel, Loader, cattle	Nil
18/05/08	01:45 – 02:00		<0.5 m/s	35.8	Trommel, Loader	Nil
21/05/08	01:15 – 01:30		1.7 m/s 104°	34.2	Loader, trommel, wind	Nil
	01:30 – 01:45		1.5 m/s 104°	34.2	Loader, trommel, wind	Nil
	01:45 – 02:00		1.8 m/s 98°	35.6	Loader, trommel, wind	Nil
	02:00 – 02:15		1.7 m/s 101°	34.1	Loader, trommel, wind	Nil
	02:15 – 02:30		1.7 m/s 100°	34.0	Loader, trommel, wind	Nil
	02:30 – 02:45		1.9 m/s 101°	34.1	No recording	250Hz
	02:45 – 03:00		1.9 m/s 99°	34.2	Loader, trommel, wind	Nil
	03:00 – 03:15		1.8 m/s 101°	34.4	Loader, trommel, wind	Nil
26/02/09	02:30 – 02:45	Approx. 1200-1300 m	<0.5 m/s	30.4	Loader	160Hz
	04:30 – 04:45		1.1 m/s 137°	35.9	Trommel, Loader	630Hz
	05:00 – 05:15		0.6 m/s 137°	35.8	Trommel	Nil
16/03/09	04:00 – 04:15		1.5 m/s 76°	35.9	Wind, loader	200Hz
	04:15 – 04:30		1.2 m/s 52°	35.9	Wind, loader	Nil

n.d. = no data

Table 3 Assessment of tonality of daytime recordings

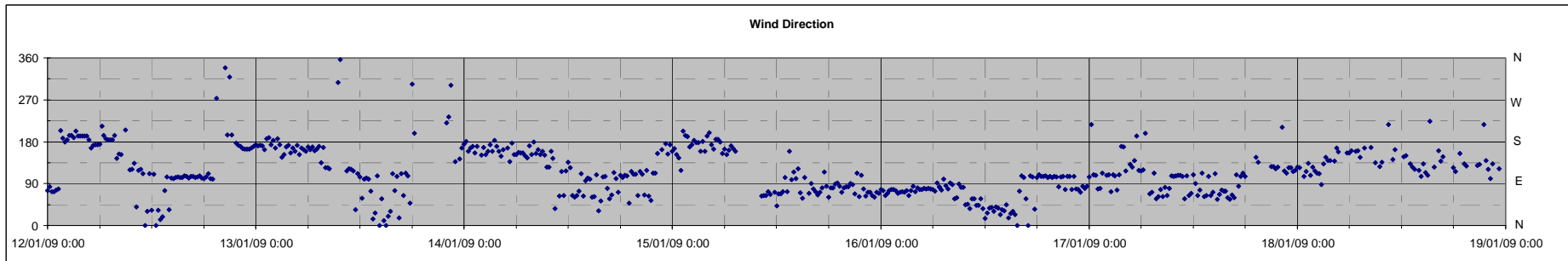
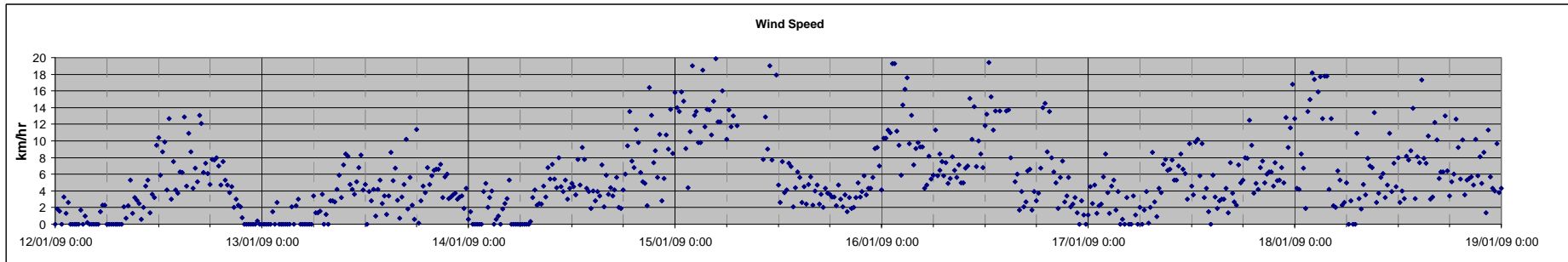
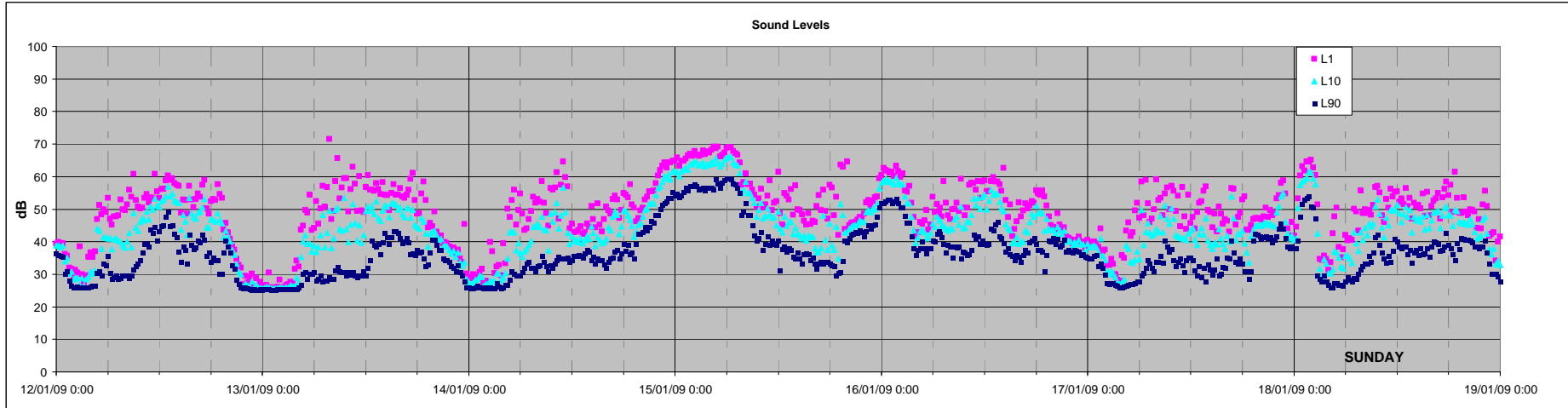
Reference equipment – Cat 637 scraper – tonal at 40Hz & 125 Hz Cat D400 haul truck – tonal at 100Hz & 500Hz						
Date	Time (WST)	Distance to mine activity	Wind	L _{AS10} (dB)	Recorded audible noise	Tonal frequencies
18/05/08	08:15 – 08:30	Approx. 500-1500 m	1.5 m/s 82°	41.1	Machinery engines, dozer tracks, birds	6.3kHz
14/07/08	08:15 – 08:30		n.d.	48.8	Machinery, wind, birds	100Hz
22/01/09	13:15 – 13:30	Approx. 1000-2000 m	2.1 m/s 45°	38.7	Wind, birds, trucks	Nil
	13:30 – 13:45		3.9 m/s 21°	38.2	Wind, birds, trucks	Nil
	13:45 – 14:00		1.7 m/s 33°	39.0	Crows, flies, trucks	10kHz
	14:00 – 14:15		1.6 m/s 75°	40.8	Wind, trucks, flies	5kHz
21/02/09	11:00 – 11:15		2.3 m/s	42.1	Machinery, birds	Nil
	11:15 – 11:30		2.1 m/s	41.5	Machinery, birds	10kHz

Gwindinup Noise Logger
Instrument EL316
Location Lot 216
Frequency Weighting A
Time Averaging Fast
Statistical Interval 15 minutes

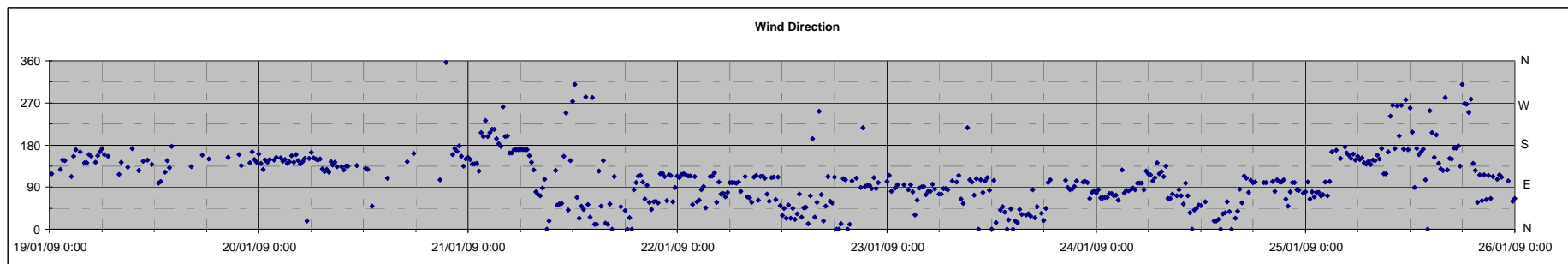
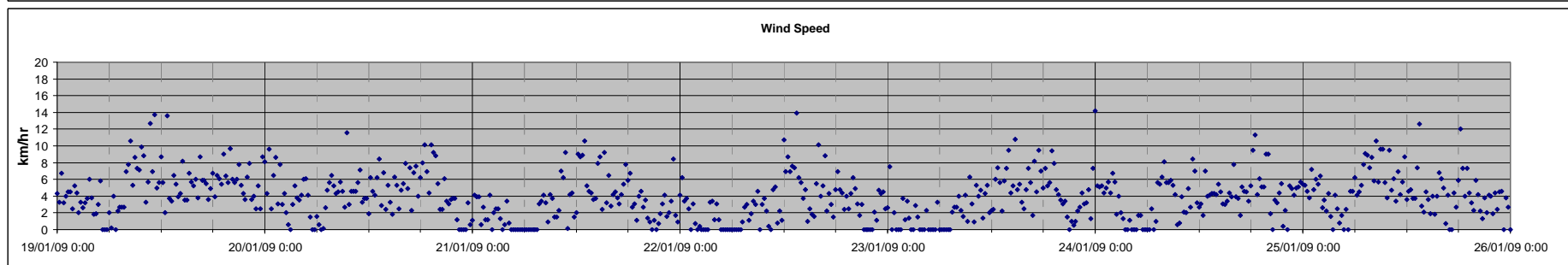
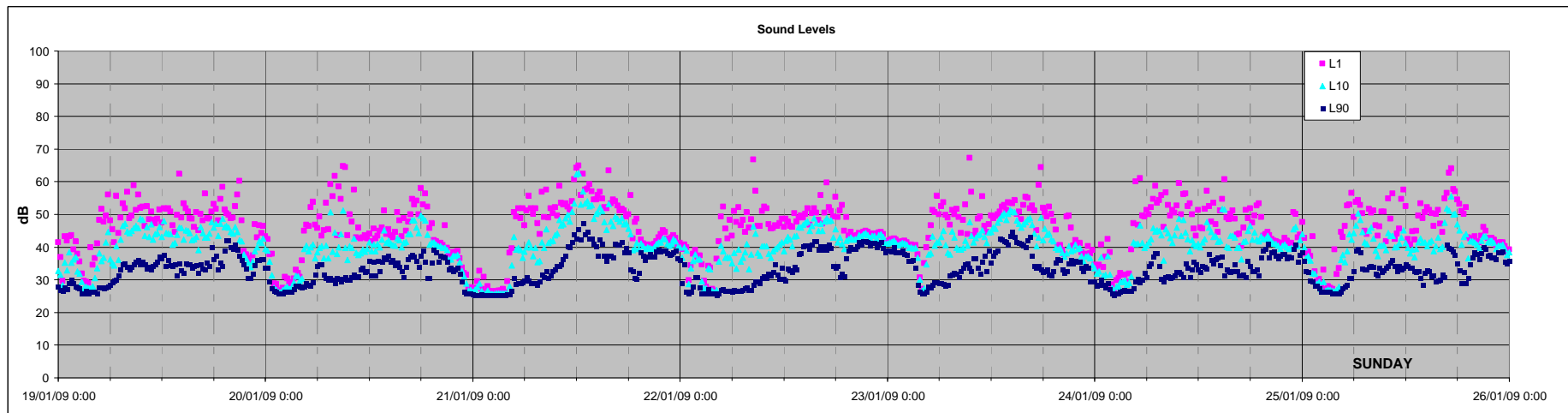


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