

APP7/2

Town and Country Planning Act 1990: Section 78 Appeals

(i) Proposed western extension and consolidation scheme

Appeal ref number APP/L6940/A/20/3265358

(ii) 'Section 73' time extension request

Appeal ref number APP/L6940/A/21/3282880

Craig yr Hesg Quarry, Pontypridd

Hanson UK

Proof of Evidence of Rachel Canham with regard to Noise - Appendices

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Appendix A: Glossary of Acoustic Terms

General Noise and Acoustics

The following section describes some of the parameters that are used to quantify noise.

Decibels dB

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure (2×10^{-5} Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

A-weighted Decibels dB(A)

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

Façade Noise Level

Façade noise measurements are those undertaken near to reflective surfaces such as walls, usually at a distance of 1m from the surface. Façade noise levels at 1m from a reflective surface are normally around 3 dB greater than those obtained under freefield conditions.

Freefield Noise Level

Freefield noise measurements are those undertaken away from any reflective surfaces other than the ground

Frequency Hz

The frequency of a noise is the number of pressure variations per second, and relates to the "pitch" of the sound. Hertz (Hz) is the unit of frequency and is the same as cycles per second. Normal, healthy human hearing can detect sounds from around 20 Hz to 20 kHz.

Equivalent Continuous Sound Pressure Level $L_{Aeq,T}$

The 'A'-weighted equivalent continuous sound pressure level $L_{Aeq,T}$, is a notional steady level which has the same acoustic energy as the actual fluctuating noise over the same time period T. The $L_{Aeq,T}$ unit is dominated by higher noise levels, for example, the $L_{Aeq,T}$ average of two equal time periods at, for example, 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A).

The L_{Aeq} , is the chosen unit of BS 7445-1:2003 "Description and Measurement of Environmental noise".

Maximum Sound Pressure Level L_{Amax}

The L_{Amax} value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval. Maximum levels are measured with either a fast or slow time weighted, denoted as $L_{Amax,f}$ or $L_{Amax,s}$ respectively.

Sound Exposure Level L_{AE} or SEL

The sound exposure level is a notional level which contains the same acoustic energy in 1 second as a varying 'A'-weighted noise level over a given period of time. It is normally used to quantify short duration noise events such as aircraft flyover or train passes.

Appendix A (continued)

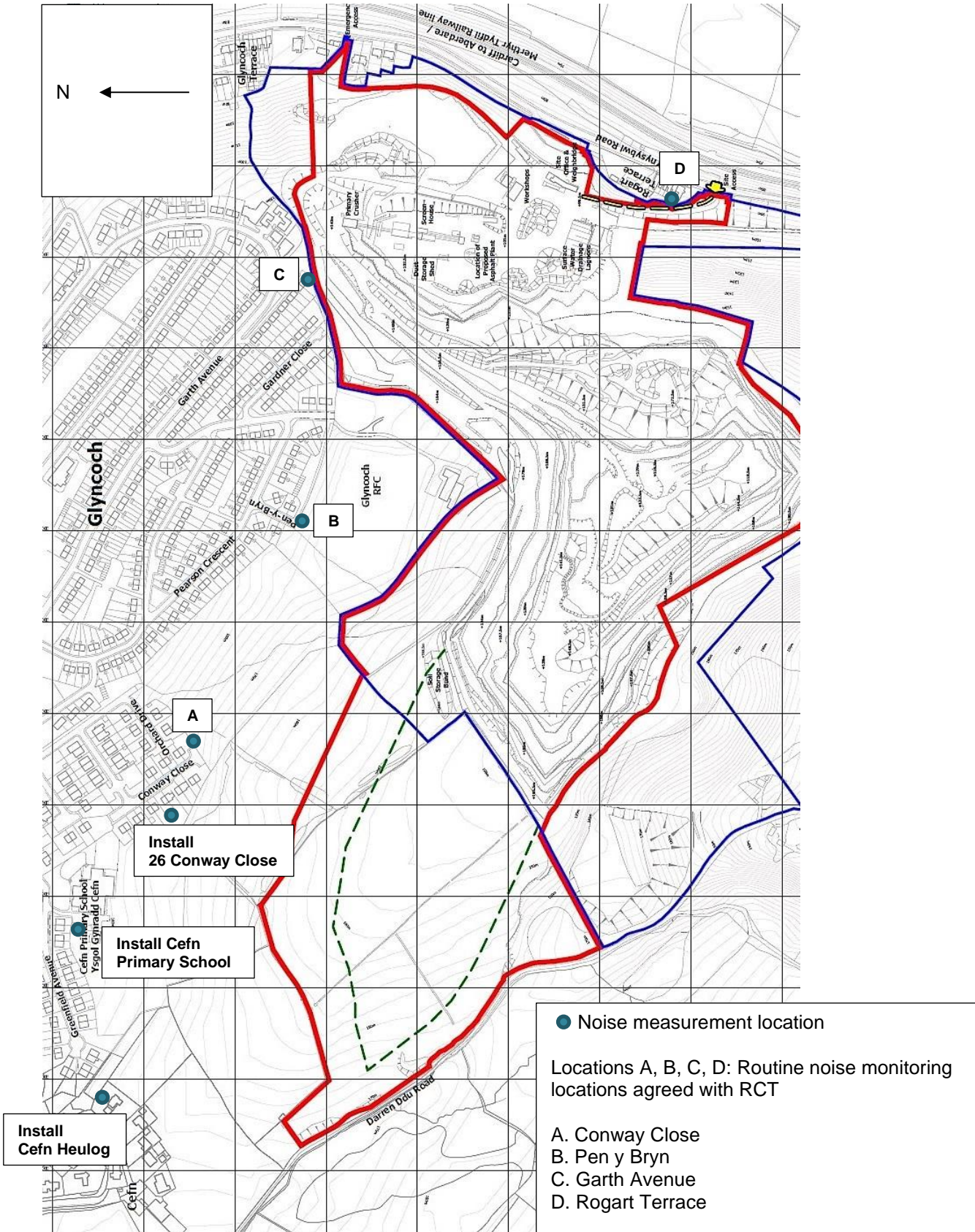
Statistical Parameters L_N

In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the $L_{A01,T}$, $L_{A10,T}$ and the $L_{A90,T}$.

$L_{A10,T}$ is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the $L_{A10,T}$ unit is typically 2–3 dB(A) above the $L_{Aeq,T}$ value over the same period.

$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

Appendix B: Noise Survey Locations



Appendix C: March 2022 Noise Survey Results

Date and Locations of Survey:

Thursday 17 March 2022

In the vicinity of Craig yr Hesg Quarry, Pontypridd, South Wales at receptor locations (see Appendix B for the noise survey location plan):

- A. Conway Close (sample measurements)
- B. Pen y Bryn (sample measurements)
- C. Garth Avenue (sample measurements)
- D. Rogart Terrace (sample measurements)
- Cefn Heulog (installed sound level meter)
- Cefn Primary School (installed sound level meter)

Survey carried out by:

Rachel Canham and Sarah Large

Instrumentation and Calibration

The instrumentation used (including serial number in brackets) is tabulated below. The sensitivities of the meters were verified on site immediately before and after the survey using the associated field calibrator. The measured calibration levels were as follows:

Used for	Instrumentation	Start Cal	End Cal
15 min samples Locations A and D	Norsonic 140 Sound Level Meter (1403136)	114.1 dB(A)	114.1 dB(A)
	Norsonic 1251 Calibrator (31992)		
1 hour samples Locations A and D	Norsonic 140 Sound Level Meter (1404819)	113.7 dB(A)	113.7 dB(A)
	Norsonic 1251 Calibrator (33321)		
15 min samples Locations C and B	Norsonic 140 Sound Level Meter (1403137)	113.8 dB(A)	113.7 dB(A)
	Norsonic 1251 Calibrator (31993)		
1 hour samples Locations C and B	Norsonic 140 Sound Level Meter (1403138)	113.9 dB(A)	113.9 dB(A)
	Norsonic 1251 Calibrator (31991)		
1 hour samples, Cefn Primary School*	Rion NL-52 Sound Level Meter (420715)	94.1 dB(A)	94.0 dB(A)
	Rion NC-74 Calibrator (34425556)		
1 hour samples, Cefn Heulog*	Rion NL-52 Sound Level Meter (420716)	94.0 dB(A)	93.9 dB(A)
	Rion NC-74 Calibrator (34425557)		

* Installed meter

The meters and calibrators are tested monthly against Norsonic Calibrators, type 1253 (serial number 22906) and type 1256 (serial number 125626100) both with UKAS approved laboratory certificates of calibration. In addition, the meters and calibrators undergo traceable calibration at an external laboratory every two years.

Appendix C (continued)

Weather Conditions:

The weather conditions at the times of the noise measurements are tabulated below.

Craig yr Hesg Quarry weather station data for 17 March 2022				
Time	Average wind speed mph	Wind direction	Temp °C	Rainfall mm
08:30	2.0	SSW	4.3	0
09:00	4.0	SSW	5.3	0
09:30	4.0	SSW	6.4	0
10:00	4.9	S	8.1	0
10:30	6.0	SSW	9.4	0
11:00	6.9	SSW	9.3	0
11:30	8.1	SW	9.4	0
12:00	6.9	SSW	9.5	0
12:30	6.9	SSW	9.4	0
13:00	6.9	SSW	9.4	0
13:30	6.0	SSW	9.7	0
14:00	8.1	SSW	9.7	0
14:30	6.9	SSW	9	0
15:00	6.0	S	9.1	0
15:30	4.9	SSW	9.2	0
16:00	4.9	SSW	9.1	0
16:30	2.9	SSW	9	0
17:00	2.9	S	9.2	0
17:30	2.0	SSW	9.3	0

Survey Details

A sound level meter was installed in the rear garden of Cefn Heulog between 08:30 and 16:25 hours and set up to continually record 1 hour measurements.

A sound level meter was installed at Cefn Primary School, to the west of the school buildings and near the school garden between 08:45 and 16:15 hours. This location was suggested by the school as it was secure and away from pupil activity in the playground. The meter was set up to continually record 1 hour measurements.

At Locations A, B, C and D, 3 x 1-hour samples measurements were undertaken at each location. Simultaneous 15 minute samples were also undertaken for comparison purposes.

For all install and samples measurements, the microphones were approximately 1.5m above local ground in freefield conditions.

Appendix C (continued)

Survey Results and Observations

Table C1: Installed Meter at Cefn Heulog, 17 March 2022

1 hour samples			Comments / Observations
Start Time	Results dB		
	L _{Aeq,1h}	L _{A90,1h}	
08:30	48	38	Observations during sound level meter installation: noise due to distant road traffic, distant aircraft, birdsong. Local activity – gardening work, scraping/laying paving slabs, workmen's voices
09:30	47	37	
10:30	47	37	
11:30	46	40	
12:30	50	38	
13:30	47	38	
14:30	46	37	
15:30*	48*	36*	
	47	37	

* sample duration 55 minutes

Table C2: Installed Meter at Cefn Heulog Primary School, 17 March 2022

1 hour samples			Comments / Observations
Start Time	Results dB		
	L _{Aeq,1h}	L _{A90,1h}	
08:45	43	37	Observations during sound level meter installation: noise due to birdsong/calls, distant road traffic, distant aircraft, activity at the local housing
09:45	45	37	
10:45	46	39	
11:45	47	39	
12:45	45	39	
13:45	45	38	
14:45	46	38	
15:45*	43*	38*	Observations during sound level meter collection: noise environment was noted to be similar to that observed during the meter set up
	45	38	Average Noise Levels

* sample duration 30 minutes

Appendix C (continued)

Survey Results and Observations

Table C3: Sample Measurements at Location A, Conway Close, 17 March 2022

1 hour samples			15 minute samples			Comments / Observations
Start Time	Results dB		Start Time	Results dB		
	L _{Aeq,1h}	L _{A90,1h}		L _{Aeq,15min}	L _{A90,15min}	
10:59	46	38	10:59	47	38	Noise due to distant road traffic, distant aircraft, some birdsong, rustling leaves. Occasional barking dog, occasional children playing at school. Local vehicles at 11:07, 11:29.
			11:15	45	39	
			11:31	45	39	
			11:46	47	39	
13:28	46	38	13:28	43	38	Noise due to distant road traffic, birdsong/calls, rustling leaves, distant aircraft. Occasional barking dog, occasional children playing at school.
			13:43	46	37	
			13:59	47	39	
			14:15	46	38	
16:32	[54]	37	16:32	50	38	Noise due to distant road traffic, birdsong/calls, local activity. 17:10 car arrives with noisy barking dogs, affected L _{Aeq,T} values marked in brackets
			16:48	47	37	
			17:03	[59]	38	
			17:19	43	37	
	46*	38		47*	38	Average Noise Levels

* excluding noisy barking dogs

Appendix C (continued)

Survey Results and Observations

Table C4: Sample Measurements at Location B, Pen y Bryn, 17 March 2022

1 hour samples			15 minute samples			Comments / Observations
Start Time	Results dB		Start Time	Results dB		
	L _{Aeq,1h}	L _{A90,1h}		L _{Aeq,15min}	L _{A90,15min}	
10:12	44	36	10:12	43	36	Noise due to birdsong, distant road traffic, some local traffic, distant aircraft, wind in trees. Occasional barking dogs. Radio at nearby house at start of measurement. Noise from children playing in distance.
			10:27	46	36	
			10:42	44	37	
			10:57	42	37	
12:44	47	37	12:44	51	39	Noise due to children playing in distance, wind in trees, birdsong, distant road traffic noise, distant aircraft. Local activity (distant + intermittent DIY, sawing/cutting). Voices from resident at start of measurement.
			13:00	42	37	
			13:15	44	37	
			13:30	40	37	
15:08	45	37	15:08	40	36	Noise due to birdsong, distant road traffic, barking dog, wind in trees, distant aircraft. Children's voices in distance.
			15:23	45	37	
			15:38	47	36	
			15:53	47	36	
	46	37		45	37	Average Background Noise Level

Appendix C (continued)

Survey Results and Observations

Table C5: Sample Measurements at Location C, Garth Avenue, 17 March 2022

1 hour samples			15 minute samples			Comments / Observations
Start Time	Results dB		Start Time	Results dB		
	L _{Aeq,1h}	L _{A90,1h}		L _{Aeq,15min}	L _{A90,15min}	
08:55	52	47	08:55	52	49	Noise due to distant road traffic (dominant) with some local traffic, intermittent cars at Spar shop, birdsong, distant aircraft. Occasional barking dog. Workmen at nearby property (use of hand tools, occasional voices). Local vehicle at 09:29.
			09:10	51	48	
			09:25	54	46	
			09:40	51	46	
11:22	48	44	11:22	49	45	Noise due to distant road traffic (less than previous measurement) and local traffic, birdsong, occasional barking dog, distant aircraft, wind in trees. Local activity (works on roof on nearby property)
			11:37	47	44	
			11:52	48	44	
			12:07	48	44	
14:00	49	45	14:01	48	45	Noise due to distant and local road traffic, birdsong, wind in trees, distant aircraft, occasional barking dog. Local activity (voices from pedestrians, use of hand tools nearby).
			14:16	48	44	
			14:31	49	46	
			14:46	48	46	
	50	45		50	45	Average Background Noise Level

Appendix C (continued)

Survey Results and Observations

Table C6: Sample Measurements at Location D, Rogart Terrace, 17 March 2022

1 hour samples			15 minute samples			Comments / Observations
Start Time	Results dB		Start Time	Results dB		
	L _{Aeq,1h}	L _{A90,1h}		L _{Aeq,15min}	L _{A90,15min}	
09:35	56	53	09:35	57	53	Noise controlled by local and distant road traffic, also birdsong/calls, distant aircraft, occasional trains.
			09:51	56	53	
			10:07	57	53	
			10:22	57	53	
12:12	56	52	12:12	56	53	Noise controlled by local and distant road traffic, also birdsong/calls including crowing cockerel, distant aircraft, occasional trains.
			12:27	56	52	
			12:43	56	52	
			12:58	57	52	
14:57	57	54	14:57	57	54	Noise controlled by local and distant road traffic, also birdsong/calls, occasional trains.
			15:14	58	54	
			15:29	58	54	
			15:45	58	54	
	57	53		57	53	Average Noise Levels

Appendix D: Summary of Sample Measurements

Table D1: 2013-2017 Routine Noise Monitoring at Conway Close (Location A)

Start Time	Results T = 15 mins		Comments
	dB LA90,T	dB LAeq,T	
			Saturday 06 April 2013
08:20	41	44	Distant main road traffic, birdsong. Quarry activity not noticeable.
09:30	42	45	Distant road traffic, birdsong, local activity. Quarry activity not noticeable.
			Friday 22 November 2013
13:47	44	46	<i>Site activity not audible apart from distant engine noise from quarry. Road traffic. Wind in trees. Aircraft.</i>
			Saturday 23 November 2013
09:28	49	51	Site activity not audible. Road traffic in distance. Birdsong. Passers-by.
			Thursday 10 July 2014
14:28	38	44	Distant road traffic. Breeze in trees. Site activity not audible. Cars turning in road paused out of sample when close. Aircraft.
16:51	40	46	Site activity not audible. Breeze in trees. Road traffic.
			Friday 05 December 2014
12:47	44	48	Road traffic in distance. Aircraft. Children in school playground. Wind in trees. Site activity not audible. Car movement on Close paused out of sample.
14:15	41	47	Distant road traffic. Wind in trees. Aircraft. Children in school playground. Site activity not audible.
			Monday, 08 June 2015
12:35	41	45	Site activity not audible. Distant road traffic. Breeze in trees. Occasional barking dog. Birdsong. Children in school playground.
13:50	38	43	Site activity not audible. Distant road traffic. Wind in trees. Birdsong. Barking dogs.
			Thursday, 30 June 2016
10:59	34	46	Site activity not audible. Distant road traffic. Aircraft. Construction work on nearby house at end of sample.
12:37	36	43	Site activity not audible. Distant road traffic. Birdsong. Discussions at nearby dwellings. Breeze in trees. Turning car paused out of sample.
			Wednesday 05 July 2017
13:36	36	38	Site activity not audible. Distant road traffic. Birdsong. People on street. Children in playground in distance.
15:00	34	37	Site activity not audible. Distant road traffic. Birdsong. Wind in trees.
	40		Average background noise (excluding 1 x sample where some site noise was audible)

Appendix D (continued)

Table D2: December 2020, Noise Sample Measurements at Conway Close (Location A)

Start Time	Results T = 15 mins		Comments
	dB L _{A90,T}	dB L _{Aeq,T}	
			Tuesday 08 December 2020
17:28	40	41	Distant road traffic, local vehicle movement (parking)
			Wednesday 09 December 2020
09:10	45	47	Distant road traffic. Site activities inaudible
15:08	42	45	Distant road traffic, some birdsong, local vehicle manoeuvring. Site inaudible

Table D3: March 2021. Noise Sample Measurements at 26 Conway Close

Start Time	Results T = 15 mins		Comments
	dB L _{A90,T}	dB L _{Aeq,T}	
			Thursday 04 March 2021
14:21	40	50	Dog bark next door, birdsong, distant road traffic, distant horn, distant child's voice, distant water sounds from dwelling, distant power tools, aircraft. Quarry activity inaudible.
14:36	40	50	
			Tuesday 09 March 2021
16:50	32	53	Distant road traffic, birdsong, dog bark and growl. Quarry activity inaudible.

Appendix D (continued)

Table D4: 2013-2017 Routine Noise Monitoring at Pen y Bryn (Location B)

Start Time	Results T = 15 mins		Comments
	dB L _{A90,T}	dB L _{Aeq,T}	
			Saturday 06 April 2013
07:55	36	45	Distant main road traffic, birdsong, minimal local activity. Quarry activity not noticeable.
09:05	37	42	Distant main road traffic, few local vehicles, birdsong. Quarry activity not noticeable.
			Friday 22 November 2013
13:27	41	44	Site activity not audible apart from distant rumble of engine noise. Distant road traffic. Passing vehicle on Pen y Bryn and Motorbike in park paused out of sample.
			Saturday 23 November 2013
09:08	43	46	Site activity not audible. Road traffic in distance. Birdsong. Barking dog.
			Thursday 10 July 2014
14:03	34	41	Quarry activity not audible. Breeze in trees. Aircraft. Motorbike on grassed land between measurement position and quarry, paused out when passing near to survey position. Occasional car movements on nearby roads.
16:28	35	42	Site activity not audible. Road traffic. Aircraft. Breeze in trees. Children playing.
			Friday 05 December 2014
12:26	37	43	Some noise from rubbish collection vehicle. Distant school noise. Wind in trees. Site activity not audible. Aircraft. Passing car paused out of sample. Birdsong.
13:55	37	45	Distant road traffic. Occasional vehicle movements on estate roads. Birdsong. Breeze in trees. Aircraft. Site activity not audible.
			Monday, 08 June 2015
12:13	35	40	Site activity not audible. Distant road traffic. Wind in trees. Occasional vehicle movement on local roads. Some power tool use at a dwelling.
13:31	33	37	Site activity not audible. Distant road traffic. Wind in trees. Birdsong.
			Thursday, 30 June 2016
10:39	32	42	<i>Site activity just audible to east, with engine noise noted. Birdsong. Distant road traffic. Barking dogs. Two passing vehicles paused out of sample.</i>
12:17	35	38	<i>Site activity just audible with engine noise noted. Activity at nearby dwelling. Birdsong.</i>
			Wednesday 05 July 2017
13:15	31	39	Site activity not audible. Distant road traffic. Neighbours chatting. Breeze in trees. Distant siren. Occasional car movement on local road. Aircraft.
14:41	31	36	Site activity not audible. Distant road traffic. Aircraft. Birdsong. Breeze in trees.
	36		Average background noise (excluding 2 samples where site activity was just audible)

Appendix D (continued)

Table D5: December 2020, Noise Sample Measurements at Pen y Bryn (Location B)

Start Time	Results T = 15 mins		Comments
	dB L _{A90,T}	dB L _{Aeq,T}	
			Tuesday 08 December 2020
17:01	35	41	Distant road traffic, dogs barking, extract at house, voices from children on bikes in field, local vehicle movements, distant sirens, distant aircraft
			Wednesday 09 December 2020
08:48	36	40	<i>Distant road traffic, some birdsong/calls, local activity (people leaving houses, starting cars, engines running). Broadband alarm and vehicle movement (<39 dB) possibly due to site</i>
14:43	35	54	Distant road traffic, local activity (cars, digging in garden, locals chatting). Site inaudible

Table D6: March 2021. Noise Sample Measurements at Pen y Bryn (Location B) – Site Not Operating

Start Time	Results T = 15 mins		Comments
	dB L _{A90,T}	dB L _{Aeq,T}	
			Tuesday 09 March 2021
17:58	34	42	Distant road traffic, car move off, distant metal gate, distant child's voice, distant coughing, distant door shut, distant scream, birdsong, distant emergency vehicle siren, birdcalls, cars on Pearson Cres, emergency vehicle siren close by (short), distant vehicle horn, distant idling fire engine, passerby, distant dog bark, mobile phone playing from passerby, passersby talking.
18:13	35	43	Distant idling fire engine, distant talking, distant aircraft, birdsong, distant children's voices, slight breeze in trees, distant motorbike, dog bark, horn, vehicles on Pearson Cres, distant coughing, passing vehicle, dog panting, passersby, e-scooters.

Appendix D (continued)

Table D7: March 2021. Noise Sample Measurements at Garth Avenue (Location C) – Site Not Operating

Start Time	Results T = 15 mins		Comments
	dB LA90,T	dB LAeq,T	
			Tuesday 09 March 2021
18:38	46	49	Distant road traffic, birdsong, road traffic on Garth Avenue, distant child voices, birds rustling leaves & wings, distant door slam, motorbike on Garth Ave, distant horn, clatters from Garth Ave, buzz off light/electricity, van start and move off on Garth Ave.
18:53	44	47	Distant road traffic, road traffic on Garth Ave, distant aircraft, birds, voices on Garth Ave, metal gate, distant voices on Garth Ave, cars start on Garth Ave, distant motorbike.

Table D8: March 2021. Noise Sample Measurements at Cefn Heulog

Start Time	Results T = 15 mins		Comments
	dB LA90,T	dB LAeq,T	
			Thursday 04 March 2021
15:18	41	48	Distant road traffic, birdsong.
15:33	42	56	Distant road traffic, birdsong, car door talking by meter, TV from house.
16:03	42	46	Distant road traffic, birdsong, quiet voices from dwelling, distant motorbike, distant metal banging from further down road.
			Tuesday 09 March 2021
17:15	34	54	Birdsong, car door, distant road traffic.