Sure Partners Limited

ARKLOW BANK WIND PARK PHASE 2
ONSHORE GRID INFRASTRUCTURE

VOLUME III
Chapter 11 APPENDICES

Appendix 11.2 Baseline Noise Monitoring

ARUP

sse Renewables

Appendix 11.2

Baseline Noise Monitoring

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Methodology

Baseline noise monitoring was carried out to establish baseline noise levels representative of the nearest receptors to the proposed noise-generating operational and construction activities due to the proposed development. Surveys were undertaken following guidance from BS 7445-1 and BS 4142.

Unattended long-term noise measurements were carried out at ten locations between 12 August 2020 and 22 September 2020. Attended daytime short-term noise measurements were also obtained at three locations (NM7, NM12, NM13) on 14 September 2020.

Unattended surveys were undertaken in two rounds. Round 1 was undertaken between 12/08/2020 and 26/08/2020 at NM1, NM2, NM4, NM11. Round 2 was undertaken between 08/09/2020 and 22/09/2020 at NM3, NM5, NM6, NM8, NM9 and NM10. A weather station was set-up at NM1 for Round 1 and was set-up at NM5 for Round 2.

Details of the monitoring equipment used can be seen in Table 1.

Due to an equipment fault at NM3 during Round 1, it was chosen to measure noise levels at NM8 for the first week of Round 2 and then move the sound level meter to NM3 for the second week of Round 2.

Table 1: Baseline noise monitoring details

Measurement location	Sound Level Meter (01 dB DUO) Serial Number	GPS Coordinates	Start date/time	End date/time
NM1	12081	52°48'45.3"N 6°10'53.1"W	12/08/2020 11:15	26/08/2020 10:30
NM2	12029	52°48'55.2"N 6°10'13.7"W	12/08/2020 13:15	23/08/2020 18:30
NM3	12049	52°48'19.1"N 6°10'34.9"W	15/09/2020 10:30	22/09/2020 11:45
NM4	12062	52°48'55.3"N 6°11'08.2"W	12/08/2020 12:30	20/08/2020 16:30
NM5	12081	52°49'41.7"N 6°07'02.1"W	08/09/2020 12:15	22/09/2020 10:15
NM6	12029	52°49'58.5"N 6°07'24.3"W	08/09/2020 11:15	22/08/2020 09:45
NM7	12085	52°49'26.4"N 6°07'20.5"W	14/09/2020 14:32	14/09/2020 15:32
NM8	12062	52°49'18.1"N 6°07'48.4"W	08/09/2020 12:45	15/09/2020 09:45

Measurement location	Sound Level Meter (01 dB DUO) Serial Number	GPS Coordinates	Start date/time	End date/time
NM9	12051	52°48'47.9"N 6°08'47.6"W	08/09/2020 13:15	15/09/2020 15:15
NM10	12049	52°48'59.4"N 6°08'43.1"W	08/09/2020 14:00	17/09/2020 05:00
NM11	12051	52°48'47.5"N 6°09'44.4"W	12/08/2020 11:45	19/08/2020 04:15
NM12	12085	52°48'38.7"N 6°08'59.7"W	14/09/2020 16:13	14/09/2020 17:13
NM13	12085	52°48'42.7"N 6°09'06.3"W	14/09/2020 17:26	14/09/2020 18:26

Table 2: Additional equipment details

Equipment	Type	Serial number	Comments
Weather station	Vaisala WXT520	L1920417	Used at NM1 12/08/2020 11:15 - 26/08/2020 10:30 Used at NM5 08/09/2020 12:15 - 22/09/2020 10:15
Calibrator	B&K 4231	2685082	Used at all locations

Results

Observations of the noise climate at each monitoring location are listed in Table 3 below.

Table 3: Noise observations

Location	Observations
NM1	Main source of noise was the timber manufacturing company located close to set up location. Other noise sources included trucks and cars coming into the industrial park.
NM2	No clear dominant noise source at set-up/collection. Wind/birds etc.
NM3	Road traffic from M11 and traffic coming into the Merck site.
NM4	Faint noise coming from Avoca industrial park.
NM5	No clear dominant noise source at set-up/collection. Wind/birds etc.
NM6	Road traffic from M11.
NM7	Quiet, minimal number of cars passing (~5 cars passed within hour)

Location	Observations
NM8	No clear dominant noise source at set-up/collection. Wind/birds etc.
NM9	Road traffic from R772
NM10	Road traffic from R772.
NM11	Road traffic from road in front of facility, as well as trucks coming in and out of the parking area.
NM12	Heavy traffic, some cars beeping as they passed
NM13	Truck company around 50m south and noise from trucks reversing in depot, there was also a driven lawn mower in Glenhaven foods started up 15mins into measurement

The noise data is presented in **Table 4** – **Table 16** below. Data has been removed from the noise data analysis where average wind speeds over a 15-minute period were above 5 m/s and where the average rain intensity over a 15-miute period was above 0.5 mm/s. This is in line with guidance from BS 4142 as to avoid adverse weather conditions and interference to the microphone.

For the unattended noise measurement locations, the summary values are derived from the mean of the $L_{Aeq,T}$ values for each time period, i.e. the summary $L_{Aeq,12h}$ is the mean of $L_{Aeq,12h}$ values. The summary $L_{A90,15min}$ values are derived from the mode of all measured $L_{A90,15min}$ values recorded within each time period over the entire measurement, i.e. for NM1 the summary day $L_{A90,15min}$ value is the mode of all $L_{A90,15min}$ values recorded between 07:00 and 19:00, 12/08/2020 – 26/08/2020.

Table 4: NM1 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Wed 12/08/2020	51	43	43	41	43	36
Thu 13/08/2020	51	44	44	41	43	35
Fri 14/08/2020	51	41	41	37	40	34
Sat 15/08/2020	48	43	40	38	38	33
Sun 16/08/2020	43	40	39	35	45	40
Mon 17/08/2020	53	45	44	37	44	38
Tue 18/08/2020	54	47	47	46	44	34
Wed 19/08/2020	55	49	51	47	52	44
Thu 20/08/2020	58	53	57	53	53	47
Fri 21/08/2020	61	52	50	49	44	36
Sat 22/08/2020	52	50	48	44	40	35
Sun 23/08/2020	53	46	46	45	40	32

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Mon 24/08/2020	53	48	48	43	55	51
Tue 25/08/2020	74	52	66	48	57	38
Wed 26/08/2020	57	46	-	-	-	-
Summary	54	44	48	38	46	35

Table 5: NM2 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Wed 12/08/2020	45	43	44	41	41	36
Thu 13/08/2020	56	41	46	44	39	29
Fri 14/08/2020	48	43	46	38	37	24
Sat 15/08/2020	47	46	54	42	35	22
Sun 16/08/2020	44	41	42	38	39	30
Mon 17/08/2020	48	41	44	32	40	27
Tue 18/08/2020	50	47	49	47	44	28
Wed 19/08/2020	53	52	52	48	55	52
Thu 20/08/2020	57	55	58	53	54	50
Fri 21/08/2020	54	52	49	49	42	32
Sat 22/08/2020	50	49	45	42	56	27
Sun 23/08/2020	48	46	-	-	-	-
Summary	50	42	48	39	44	29

Table 6: NM3 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Tue 15/09/2020	63	55	58	51	55	42
Wed 16/09/2020	62	57	59	55	55	42
Thu 17/09/2020	62	55	60	56	55	43
Fri 18/09/2020	64	58	61	58	54	42
Sat 19/09/2020	64	59	59	56	51	40
Sun 20/09/2020	61	58	59	56	55	40
Mon 21/09/2020	62	55	58	54	55	40
Tue 22/09/2020	62	57	-	-	-	-
Summary	62	58	59	56	54	42

Table 7: NM4 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Wed 12/08/2020	39	36	37	36	39	34
Thu 13/08/2020	44	36	37	36	35	33
Fri 14/08/2020	46	36	38	36	35	31
Sat 15/08/2020	40	36	36	34	36	31
Sun 16/08/2020	40	33	43	32	42	37
Mon 17/08/2020	45	40	41	37	39	35
Tue 18/08/2020	46	43	43	39	42	34
Wed 19/08/2020	48	46	47	45	53	48
Summary	44	36	41	36	40	31

Table 8: NM5 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Tue 08/09/2020	50	47	47	44	46	38
Wed 09/09/2020	53	50	49	47	46	30
Thu 10/09/2020	55	52	48	45	46	33
Fri 11/09/2020	52	48	50	47	45	36
Sat 12/09/2020	55	49	52	46	52	39
Sun 13/09/2020	53	49	48	47	44	32
Mon 14/09/2020	46	36	47	35	41	28
Tue 15/09/2020	50	49	48	49	44	27
Wed 16/09/2020	50	38	49	47	41	31
Thu 17/09/2020	44	32	48	45	44	27
Fri 18/09/2020	53	49	51	47	44	40
Sat 19/09/2020	51	48	49	48	42	35
Sun 20/09/2020	48	43	49	48	47	27
Mon 21/09/2020	49	40	47	44	44	23
Tue 22/09/2020	54	50	-	-	-	-
Summary	51	49	49	47	45	38

Table 9: NM6 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Tue 08/09/2020	55	49	47	48	46	33
Wed 09/09/2020	54	50	51	47	49	29
Thu 10/09/2020	55	51	50	47	48	36
Fri 11/09/2020	56	52	53	48	47	30
Sat 12/09/2020	56	52	54	49	50	39
Sun 13/09/2020	57	54	52	50	47	29
Mon 14/09/2020	52	48	49	46	51	29
Tue 15/09/2020	54	51	50	49	47	31
Wed 16/09/2020	54	47	51	48	46	31
Thu 17/09/2020	52	47	51	47	47	33

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Fri 18/09/2020	56	51	53	50	46	35
Sat 19/09/2020	54	52	51	39	43	34
Sun 20/09/2020	53	49	51	48	49	31
Mon 21/09/2020	53	46	50	46	47	23
Tue 22/09/2020	55	51	-	-	-	-
Summary	55	52	51	48	47	29

Table 10: NM7 results

Period start	$L_{Aeq,15min}$	$L_{A90,15min}$
14/09/2020 14:32	59	44
14/09/2020 14:47	64	52
14/09/2020 15:02	63	45
14/09/2020 15:17	65	44
Summary	63	46

Table 11: NM8 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Tue 08/09/2020	50	45	44	43	48	38
Wed 09/09/2020	53	51	52	50	50	32
Thu 10/09/2020	52	45	46	45	45	34
Fri 11/09/2020	50	48	49	46	45	32
Sat 12/09/2020	52	47	49	46	50	41
Sun 13/09/2020	53	48	46	46	42	34
Mon 14/09/2020	43	36	46	43	43	28
Tue 15/09/2020	49	43	-	-	-	-
Summary	50	48	47	46	46	33

Table 12: NM9 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Tue 08/09/2020	57	49	51	47	50	39
Wed 09/09/2020	55	49	52	49	49	40
Thu 10/09/2020	66	51	52	48	49	37
Fri 11/09/2020	59	50	55	43	47	39
Sat 12/09/2020	57	51	52	47	46	40
Sun 13/09/2020	56	50	51	42	50	36
Mon 14/09/2020	55	47	51	43	50	41
Tue 15/09/2020	55	51	-	-	-	-
Summary	58	51	52	43	49	40

Table 13: NM10 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Tue 08/09/2020	45	42	40	37	45	27
Wed 09/09/2020	49	40	51	42	48	22
Thu 10/09/2020	49	40	39	35	38	27
Fri 11/09/2020	48	42	42	30	40	26
Sat 12/09/2020	48	41	44	39	40	34
Sun 13/09/2020	50	42	42	37	37	27
Mon 14/09/2020	46	38	49	41	46	30
Tue 15/09/2020	48	39	49	47	49	32
Summary	48	42	46	37	42	27

Table 14: NM11 results

Date	Day 07:00-19:00 T = 12h		Evening 19:00-23:00 T = 4h		Night 23:00-07:00 T = 8h	
	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$	$L_{Aeq,T}$	Mode $L_{A90,15min}$
Wed 12/08/2020	54	50	52	48	50	38
Thu 13/08/2020	54	50	52	49	49	37
Fri 14/08/2020	54	51	51	49	45	24
Sat 15/08/2020	49	45	48	45	44	35
Sun 16/08/2020	53	50	51	44	47	35
Mon 17/08/2020	53	48	48	35	48	27
Tue 18/08/2020	52	49	51	48	43	38
Summary	53	46	50	40	47	27

Table 15: NM12 results

Period start	$L_{Aeq,15min}$	$L_{A90,15min}$
14/09/2020 16:13	71	59
14/09/2020 16:28	71	60
14/09/2020 16:43	70	56
14/09/2020 16:58	70	58
Summary	70	58

Table 16: NM13 results

Period start	$L_{Aeq,15min}$	$L_{A90,15min}$
14/09/2020 17:26	57	42
14/09/2020 17:41	57	42
14/09/2020 17:56	59	42
14/09/2020 18:11	57	40
Summary	57	41

NG4 Screening

The NG4 Guidance Note for Noise (January 2016) sets appropriate noise criteria for new license applications with the Environmental Protection Agency (EPA) Office of Environmental Enforcement (OEE). While the OGI substation does not fall within the NG4 schedule of activities, the noise limit criteria have been considered as relevant upper thresholds for the EIAR operational noise assessment. These are set based on screening criteria for 'Quiet Areas' and 'Areas of Low Background Noise'.

Step 1 – Quiet Area Screening of the Development Location

The substation site and sensitive receptors are 1 – 3 km from Arklow Town, which is an urban area of over 10,000 people, therefore this area cannot be considered a 'Quiet Area'.

Step 2 – Baseline Environmental Noise Survey

The methodology and results of the baseline survey are outlined in this appendix. Measurements at NM1, NM2, NM3 and NM4 are representative of the nearest sensitive receptors to noise from the operational substation.

Step 3 – Screen Areas of Low Background Noise

If all three of the below criteria are satisfied for any measurement location then those locations are deemed to be in areas of 'low background noise:

- Average Daytime Background Noise Level ≤40dB L_{AF90}, and;
- Average Evening Background Noise Level ≤35dB L_{AF90}, and;
- Average Night-time Background Noise Level ≤30dB L_{AF90}.

It can be seen in **Table 17** below, that night-time noise levels measured at NM2 are below the criteria for 'Areas of Low Background Noise'. However, daytime and evening background noise levels are above the criteria and therefore, NM2 is not considered an 'Area of Low Background Noise'. NM1, NM3 and NM4 are above the criteria at all periods of the day and therefore are also not classified as 'Areas of Low Background Noise'.

Table 17: Low Background Noise Screening

Monitoring location	Daytime $L_{A90,15min}$	Evening $L_{A90,15min}$	Night $L_{A90,15min}$
NM1	44	38	35
NM2	42	39	29
NM3	58	56	42
NM4	36	36	31

Conclusion of Screening

The substation site and nearby receptors are not defined as 'Quiet Areas' or 'Areas of Low Background Noise' and are therefore defined as 'All Other Areas'. The limits in Table 18 are applicable for 'All other Areas'.

Table 18: NG4 Recommended Noise Limit Criteria – 'All other Areas'

Daytime Noise, dB $L_{Ar,T}$ (07:00 – 19:00)	Evening Noise, dB $L_{Ar,T}$ (19:00-23:00)	Night Noise, dB $L_{Ar,T}$ (23:00-07:00)
55	50	45