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Volume 7E Proposed Development (Onshore) Appendices

Appendix 8-6 Operational Phase - Results

Caledonia Offshore Wind Farm Ltd

5th Floor Atria One, 144 Morrison Street, Edinburgh, EH3 8EX



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Table of Contents

Acronyms and Abbreviations	4
1 Introduction.....	1
2 Predicted Noise Levels, Evaluation Against Noise Rating Criteria	2
2.1.1 Standalone Operation	2
2.1.2 Cumulative Operation	6
2.1.3 BS4142 Evaluation	9

List of Tables

Table 2-1: Evaluation of Predicted Operational Noise Against Noise Rating Criteria – Onshore Substation Site in Standalone Operation	3
Table 2-2: Evaluation of Predicted Operational Noise Against Noise Rating Criteria – Onshore Substation Site in Cumulative Operation	7
Table 2-3: Evaluation of Operational Noise Levels due to Onshore Substation Site ...	10

Acronyms and Abbreviations

dB	Decibels
NR	Noise Rating
NSR	Noise Sensitive Receptor

1 Introduction

- 1.1.1.1 This appendix provides details of the potential noise impacts arising from operation of the Proposed Development (Onshore), an assessment of these results is provided within the airborne noise and vibration assessment provided within Volume 5, Chapter 8: Airborne Noise and Vibration.

2 Predicted Noise Levels, Evaluation Against Noise Rating Criteria

2.1.1 Standalone Operation

2.1.1.1 The predicted operational noise levels due to the proposed Onshore Substation Site at Noise Sensitive Receptors (NSRs) arising due to standalone operation (i.e. excluding noise from cumulative developments) are provided in Table 2-1. Predicted levels are compared with the NR20 criterion, whereby a negative result indicates predicted compliance with (predicted level below) the criterion curve. All numbers have been rounded to the nearest integer Decibels (dB).

2.1.1.2 The reduction applied to external levels provided by a partially open window to determine internal levels is provided in Volume 7E, Appendix 8-4: Method of Assessment.

Table 2-1: Evaluation of Predicted Operational Noise Against Noise Rating Criteria – Onshore Substation Site in Standalone Operation

Item	Octave band level, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
NSR1								
Predicted external level, dB	53	44	33	22	15	11	1	-29
Derived internal level, dB	33	30	19	6	1	-7	-19	-39
NR20 criterion curve, dB	51	39	31	24	20	17	14	13
Comparison with criterion	-18	-9	-12	-19	-19	-23	-33	-52
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							
NSR2								
Predicted external level, dB	43	35	24	14	6	-3	-26	-80
Derived internal level, dB	23	21	10	-2	-8	-20	-45	-90
NR20 criterion curve, dB	51	39	31	24	20	17	14	13
Comparison with criterion	-28	-19	-21	-27	-28	-36	-59	-103
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							
NSR3								
Predicted external level, dB	43	35	24	16	8	1	-20	-80

Item	Octave band level, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Derived internal level, dB	23	21	10	0	-6	-16	-39	-90
NR20 criterion curve, dB	51	41	33	26	22	19	17	13
Comparison with criterion	-28	-20	-23	-26	-28	-35	-56	-102
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							
NSR4								
Predicted external level, dB	47	39	29	20	13	7	-6	-49
Derived internal level, dB	27	25	15	4	-1	-10	-25	-59
NR20 criterion curve, dB	51	41	33	26	22	19	17	13
Comparison with criterion	-24	-16	-18	-22	-23	-29	-42	-72
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							
NSR5								
Predicted external level, dB	53	43	33	24	16	11	0	-33
Derived internal level, dB	33	29	19	8	2	-6	-19	-43
NR20 criterion curve, dB	51	39	31	24	20	17	14	13
Comparison with criterion	-18	-10	-12	-16	-18	-23	-34	-55

Item	Octave band level, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							
NSR6								
Predicted external level, dB	57	43	34	25	18	12	-2	-67
Derived internal level, dB	37	29	20	9	4	-5	-21	-77
NR20 criterion curve, dB	51	39	31	24	20	17	14	13
Comparison with criterion	-14	-11	-11	-16	-16	-22	-36	-89
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							

2.1.2 Cumulative Operation

- 2.1.2.1 The predicted operational noise levels due to the proposed Onshore Substation Site at NSRs arising due to cumulative operation (i.e. including reported predicted noise from cumulative developments comprising the New Deer and Greenvolt substations) are provided in Table 2-2. Predicted levels are compared with the NR20 criterion, whereby a negative result indicates predicted compliance with (predicted level below) the criterion curve. No data on cumulative noise was available for NSR5 and NSR6, therefore no cumulative levels are reported.
- 2.1.2.2 The reduction applied to external levels provided by a partially open window to determine internal levels is given in Volume 7E, Appendix 8-4: Method of Assessment.

Table 2-2: Evaluation of Predicted Operational Noise Against Noise Rating Criteria – Onshore Substation Site in Cumulative Operation

Item	Octave band level, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
NSR1								
Predicted external level, dB	53	44	33	22	15	11	1	-29
Derived internal level, dB	33	30	19	6	1	-6	-18	-39
NR20 criterion curve, dB	51	39	31	24	20	17	14	13
Comparison with criterion	-18	-9	-12	-18	-19	-23	-33	-51
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							
NSR2								
Predicted external level, dB	43	35	24	18	13	6	-6	-35
Derived internal level, dB	23	21	10	2	-1	-11	-25	-45
NR20 criterion curve, dB	51	39	31	24	20	17	14	13
Comparison with criterion	-28	-19	-20	-22	-21	-28	-39	-58
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							
NSR3								
Predicted external level, dB	43	35	26	25	20	13	2	-27

Item	Octave band level, dB							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Derived internal level, dB	23	21	12	9	6	-4	-17	-37
NR20 criterion curve, dB	51	39	31	24	20	17	14	13
Comparison with criterion	-28	-20	-21	-17	-16	-23	-34	-50
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							
NSR4								
Predicted external level, dB	47	39	29	21	15	9	-3	-35
Derived internal level, dB	27	25	15	5	1	-8	-22	-45
NR20 criterion curve, dB	51	41	33	26	22	19	17	13
Comparison with criterion	-24	-16	-18	-21	-21	-27	-39	-58
Result/impact significance	Predicted level meets NR20 criterion in all octave bands. Not significant.							

2.1.3 BS4142 Evaluation

- 2.1.3.1 The predicted specific noise levels at NSRs are provided, converted to rating levels by application of appropriate corrections (+2 dB for potential tonal elements) and evaluated against the representative background levels in Table 2-3. Where the measured background level is below 30 dBL_{A90}, a representative low value of 30 dBL_{A90} has been assumed, and a rating level limit of 35dB adopted in accordance with supplementary guidance to BS4142 summarised in Volume 7E, Appendix 8-1: Summaries of Relevant Policy and Guidance, Paragraph 1.3.2.7.

Table 2-3: Evaluation of Operational Noise Levels due to Onshore Substation Site

NSR – period	Predicted specific level, dBL_{Aeq,T}	Rating level (specific level +2 dB correction), dBL_{Ar,Tr}	Adopted Rating Level limit, dBL_{Aeq}	Comparison; (rating level minus rating level limit), dB
NSR1 – daytime	32	34	35	-1
NSR1 – night-time	32	34	35	-1
NSR2 – daytime	24	26	35	-15
NSR2 – night-time	24	26	35	-15
NSR3 – daytime	23	25	35	-10
NSR3 – night-time	23	25	35	-10
NSR4 – night-time	27	29	35	-6
NSR4 – daytime	27	29	35	-6
NSR5 – daytime	32	34	35	-1
NSR5 – night-time	32	34	35	-1
NSR6 – daytime	26	28	35	-8
NSR6 – night-time	26	28	35	-8

2.1.3.2 The rating level meets the adopted daytime and night-time period rating level limit at all NSRs by a margin of between 1 dB and 15 dB. Operational noise impacts are therefore not significant in Environmental Impact Assessment terms.

Caledonia Offshore Wind Farm
5th Floor, Atria One
144 Morrison Street
Edinburgh
EH3 8EX

www.caledoniaoffshorewind.com

