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DESERT CLAIM WIND PROJECT
ENVIRONMENTAL NOISE ASSESSMENT TECHNICAL REPORT

RAMBOLL

Executive Summary

Washington State's Energy Facility Site Evaluation Council (EFSEC) is the reviewing authority for large energy facilities that are constructed in Washington. In February 2010, then-Washington Governor Christine Gregoire signed the Site Certification Agreement for the Desert Claim Wind Project, following EFSEC's recommendation of approval. A noise analysis was conducted in connection with the EFSEC process and it concluded the approved project would comply with state noise regulations.

The Certificate Holder, Desert Claim Wind Power LLC, is now proposing changes in the original project design, including a reduction in the number of wind turbines generators (WTGs), changes in the location of WTGs, and different manufacturers/models of WTGs.

This new environmental noise compliance and impact assessment confirms that the revised project will continue to comply with applicable sound level limits and Site Certificate Agreement conditions. The noise impacts of the revised project would be less than or equal to those for the original project approved by EFSEC.

Contents

LIST OF TABLES

LIST OF FIGURES

APPENDICIES

1. Introduction

Ramboll US Corporation (Ramboll) prepared this Environmental Noise Assessment Technical Report for the revised Desert Claim Wind Project ("Desert Claim", or the "project"). The revised project is a proposed 25 – 31 turbine wind project centered approximately 9 miles north of Ellensburg, in Kittitas County, Washington.

The noise analysis presented herein represents an update to the previously submitted noise study prepared in 2008 by DNV Global Energy Concepts, Inc. (GEC 2008). The results of this noise analysis were evaluated for compliance with applicable sound level limits, and compared with the 2008 GEC study.

Turbine options evaluated at the time of this study included Vestas and Siemens WTGs. The proposed facility would operate turbines in normal/standard operating mode during all daytime and nighttime hours. The proposed project also would include a new electrical substation.

2. Compliance and Impact Criteria

EFSEC has previously approved the Desert Claim wind project subject to the following conditions concerning noise:

Site Certification Agreement Article V.F. Construction Noise [(1)]

> *The Certificate Holder and its contractors and subcontractors shall use industry standard noise attenuation controls during construction to mitigate noise impacts and shall comply with applicable state and local noise emission regulations. The Certificate Holder shall limit blasting and loud construction activities to daytime hours (7 a.m. to 10 p.m.), and shall comply with the applicable requirements of WAC 173-60-040(2)(b) during the hours of 10:00 p.m. and 7:00 a.m.*

Site Certificate Agreement Article VII.B. Noise Emissions

> *The Certificate Holder shall operate the Project in Compliance with applicable Washington State Environmental Noise Levels, WAC 173-60.*

[(1)] The general construction methods for the revised project are the same as those considered in 2009. Construction noise was analyzed at that time and this condition was included in the Site Certification Agreement. The construction schedule of the revised and smaller project evaluated for this assessment may be shorter, however no change in the levels or types of construction noise is anticipated.

WAC 173-60 establishes limits on sounds crossing property boundaries based on the Environmental Designation for Noise Abatement (EDNA) of the sound source and the receiving properties. EDNAs are based on the zoned uses, with Class A, B, and C generally referring to residential, commercial, and agricultural or industrial properties, respectively. The applicable noise limits for each EDNA source/receiver combination are listed in **Table 1**.

Table 1. WAC Maximum Permissible Environmental Noise Levels (dBA)

EDNA of Source Property	EDNA of Receiving Property		
	Class A Day/Night	Class B	Class C
Class A (Residential)	55/45	57	60
Class B (Commercial)	57/47	60	65
Class C (Industrial)	60/50	65	70

The limitations for noise received in Class A EDNAs are reduced by 10 dBA during nighttime hours, defined in the state rule as 10 p.m. to 7 a.m.

Source: WAC 173-60-40

The regulation provides that the "maximum permissible" environmental noise levels (**Table 1**) may be exceeded for short periods by a total of not more than 15 minutes in any one-hour period. The allowed short-term increases follow: 5 dBA for no more than 15 minutes in any hour, or 10 dBA for no more than 5 minutes of any hour, or 15 dBA for no more than 1.5 minutes of any hour. These allowed short-term increases can be described in terms of noise metrics that represent the percentage of time certain levels are exceeded. For example, the hourly L_{25} metric represents the sound level that is exceeded 25 percent of the time, or 15 minutes in an hour. Similarly, the $L_{8.3}$ and $L_{2.5}$ are the sound levels exceeded 5 and 1.5 minutes in an hour, respectively. The maximum permissible levels are not to be exceeded by more than 15 dBA at any time, and this limit is represented by the L_{max} noise metric.

The WAC noise rules contain some leeway in the classification of the appropriate EDNA. EFSEC, in its review of the Kittitas Valley and Wild Horse Wind Power Project EISs, allowed identification of differing use areas of single properties, essentially "breaking up" the properties into separate EDNAs, with the agricultural portions of the surrounding properties considered Class C receivers and the residences considered Class A receivers.

As a conservative assumption to be protective of residential properties located within the project vicinity, this noise analysis used the current land uses to determine the EDNAs of the receiving properties. Accordingly, irrespective of the underlying zoning, parcels currently used for residential use were considered Class A receivers, while adjacent agricultural or

silvicultural lands were considered Class C receivers and the wind turbines were considered Class C sources.

The sound level limits for all residential receiving properties in the vicinity of Desert Claim is 50 dBA during nighttime hours (i.e., Class C sources affecting Class A receivers), and 60 dBA during daytime hours. The report focuses on the 50 dBA limit because the turbines would operate 24 hours a day. For receivers representative of adjacent agricultural or silvicultural land, the day and night limit is 70 dBA (i.e., Class C sources affecting Class C receivers).

3. Existing Environment

The project area and vicinity is rural, consisting primarily of agricultural, ranching, and low-density residential uses. In general, there are very few acoustically-significant sources of ambient noise within the project vicinity. Traffic along some local roadways is the only major noise source when traffic is present (generally only one car at any one time), and varies by roadway and time of day. Additional sources of noise may include farming equipment, occasional aircraft fly-overs, birds, and insects.

Wind can greatly affect the ambient noise environment due to noise from wind rustling vegetation including grasses, trees, and shrubs.

4. Noise Assessment - Methods

4.1 Assessment Criteria

An assessment of compliance with the WAC limits are a condition of the Site Certification Agreement. The assessment is based on a comparison of the WAC limits with project-only sound levels, as predicted through computer noise modeling. This assessment also includes comparison of the modeled noise results from the configurations currently proposed to the modeling performed in 2008 by GEC that accompanied the 2009 Desert Claim Application.

4.2 Noise Modeling Tool and Critical Inputs

Noise generated by project-related sources, as received at nearby residences, was estimated using the Datakustik CadnaA noise model. CadnaA is a sophisticated software program that enables noise modeling of complex industrial sources using sound propagation factors as adopted by the International Organization for Standardization (ISO). [(2)] Atmospheric absorption was estimated for conditions of 10°C and 70 percent relative humidity (i.e., conditions that favor propagation) and computed in accordance with ISO

[(2)] The ISO has established internationally recognized standard methods for calculating noise attenuation through the atmosphere.

9613-2. The modeling process included the following steps: (1) characterizing the noise sources, (2) creating 3-dimensional maps of the site and vicinity to enable the model to evaluate effects of noise attenuation due to distance, topography, atmosphere, and ground absorption, and (3) assigning the equipment sound levels to appropriate locations on the site. CadnaA then constructed topographic cross sections to calculate sound levels in the vicinity of the project site. This modeling focused on project-related sources and used "receptors" as the receiving locations as described below in Section **4.2.1**.

Terrain in the project vicinity is relatively flat, however topography was factored into the noise model to account for slight variations, as well as the rise in elevation west of the project. Ground absorption was set to 0.5, representative of a partially reflective ground surface that may be due to snow or hard-packed soil. Note that a ground absorption value of 0 would be suitable for tall grasses or trees, and a value of 1 would be suitable for a reflective surface such as a lake or a parking lot.

4.2.1 Receptors

Residential properties are located east, west, north and south of the project site. A total of ninety-eight (98) "receptors" were included in this study to represent these project noise-receiving locations, and to represent adjacent agricultural and silvicultural land. The 98 receptor locations are illustrated in **Figure 1** and **Figure 2**, and include eighty-eight (88) EDNA Class A receivers, represented by R1 through R88, and ten (10) EDNA Class C receivers, represented by R89 through R98.

Note that the GEC study provided WTG noise level estimates at a total of thirty-seven (37) receiving locations. Corresponding receptor IDs, for comparison with the 2008 study, can be found in **Table 4**.

4.2.2 Wind Turbine Generators

Wind turbine generator (WTGs) evaluated for this assessment include two options, including:

Vestas (30 WTGs total) [3]:

- V110 – 2.0 MW, Normal Operating Mode (Mode 0-0S), standard blades, 80 m Hub Height (5 WTGs)
- V136 – 4.2 MW, Power Optimized Mode (Mode PO1), blades with serrated trailing edge, 82 m Hub Height (25 WTGs)

[3] Desert Claim is also considering an 80 MW Vestas configuration that would include only 25 turbines. That configuration has not been analyzed separately because it would simply remove 5 of turbines considered in the Vestas configuration that is analyzed in this report.

Siemens (31 WTGs total):

- SWT-2.346-108 – 2.346 MW, Standard Setting, 80 m Hub Height (4 WTGs)
- SWT-2.625-120 – 2.625 MW, Standard Setting, 85.1 m Hub Height (27 WTGs)

The locations of the Vestas and Siemens WTGs are depicted in **Figure 1** and **Figure 2**, respectively.

4.2.3 Substation

The project would include a new electrical substation to connect the WTGs to the PSE power grid. At the time of this assessment a vendor for the substation equipment had not yet been selected. Noise emission data from a substation for an existing wind project were used to represent the substation for Desert Claim. The location of substation is shown in both **Figure 1** and **Figure 2**.

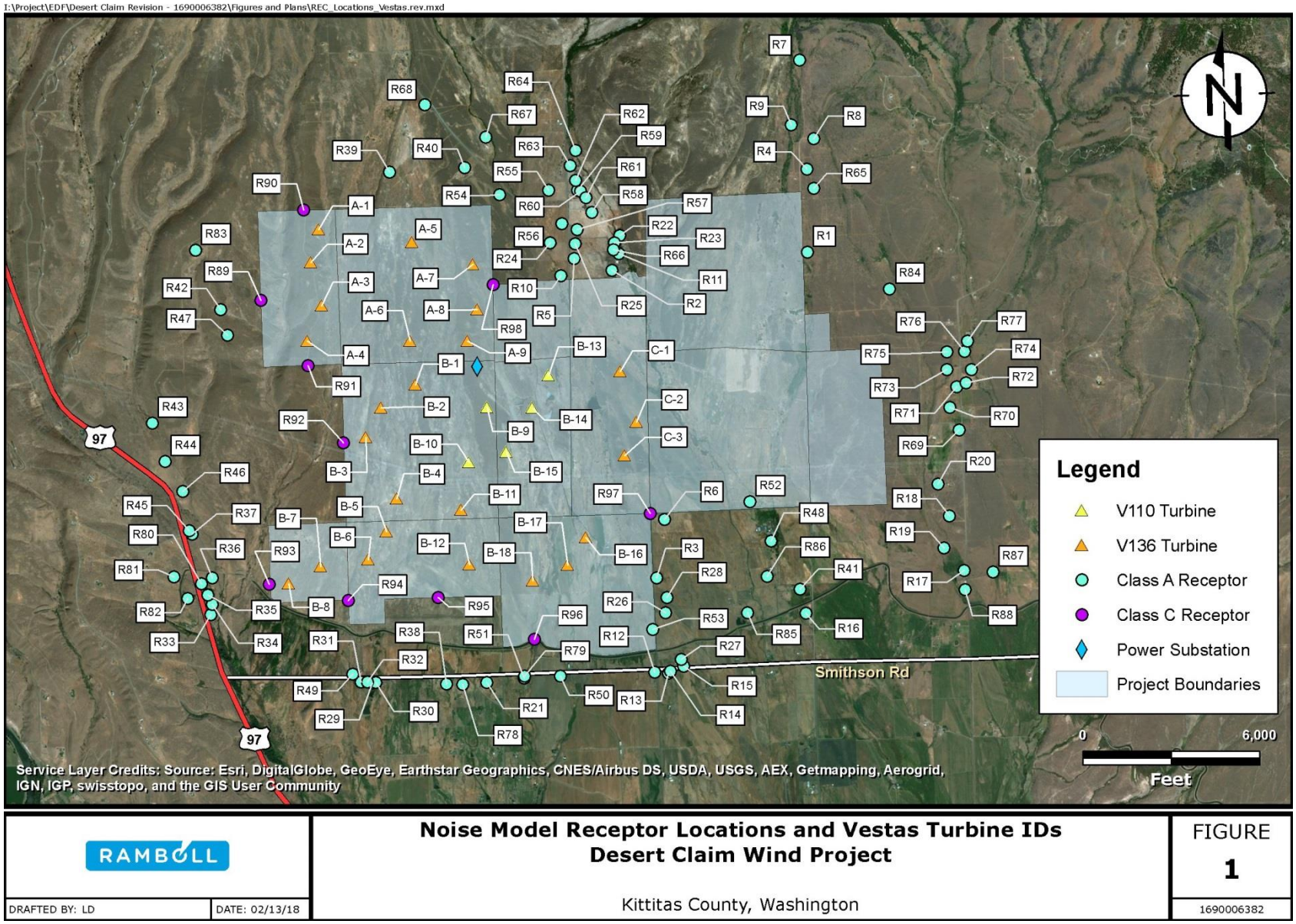

Figure 1: Vestas Option Wind Turbine and Receiver Locations

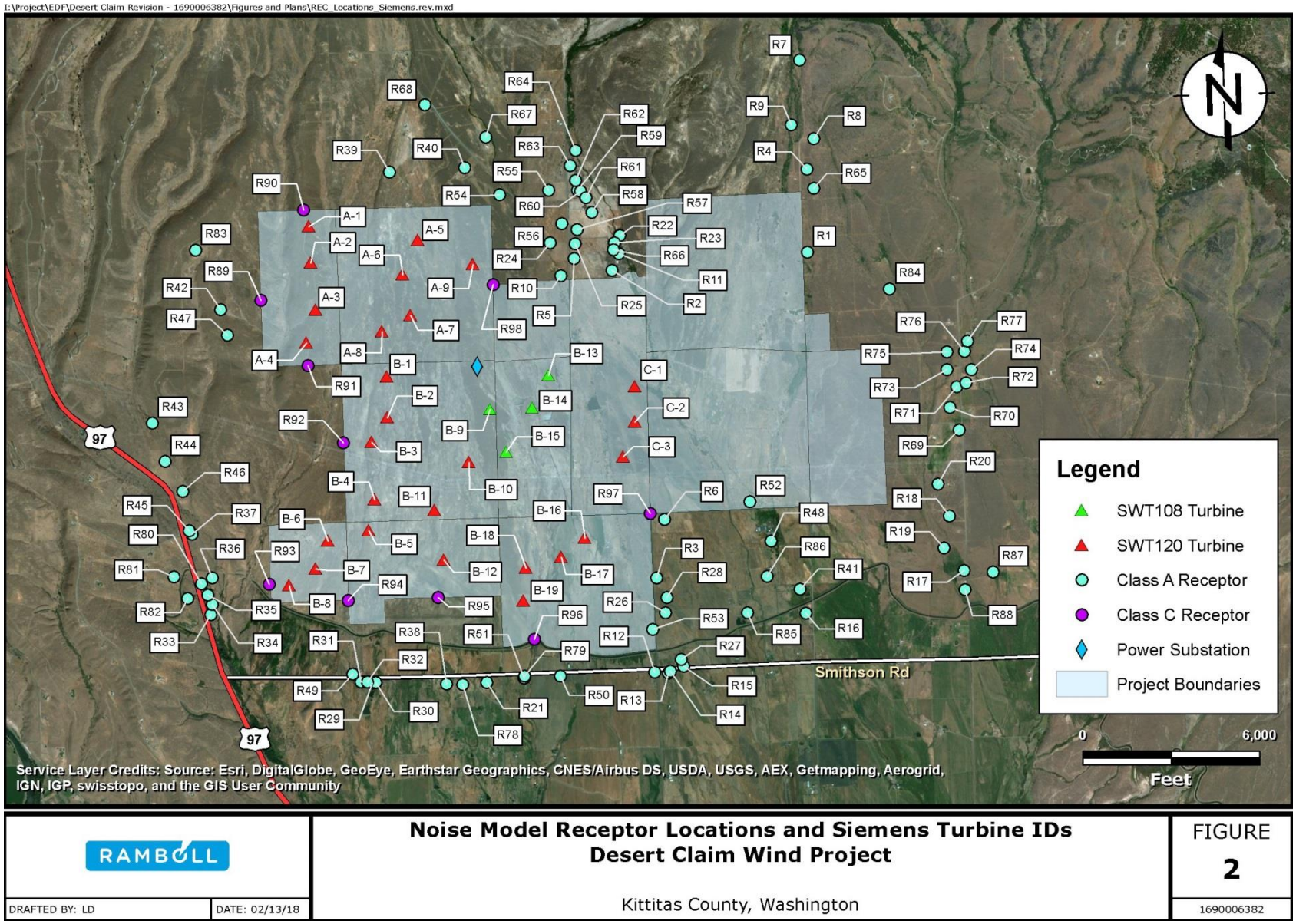

Figure 2: Siemens Option Wind Turbine and Receiver Locations

4.2.4 Source Sound Power Data

Sound power level data for WTGs and the substation are summarized below in **Table 2** in 1/1 octave resolution (the sound level frequency resolution applied in the noise model) for the three (3) wind speed scenarios (at hub height) evaluated for this assessment.

Table 2. Source Sound Level Data

Source	Wind Speed	1/1 Center Octave Sound Power Level (dB)									
		31.5	63	125	250	500	1k	2k	4k	8k	Tot (A)
V110[a]	4 m/s	63.8	76.2	83.2	88.2	90.3	90.7	89.0	81.7	69.3	96.1
	8 m/s	72.6	84.9	92.7	98.5	100.8	100.6	98.3	90.6	79.7	106.1
	10 m/s	76.2	87.0	93.9	98.3	101.4	102.7	101.2	94.2	80.8	107.6
V136[b]	4 m/s	61.0	78.4	82.0	84.1	81.4	85.8	82.6	75.3	63.8	90.9
	8 m/s	74.5	86.0	91.2	94.5	96.2	97.7	96.6	88.5	68.5	103.0
	10 m/s	75.6	86.7	92.0	95.4	97.2	98.6	97.5	89.4	69.3	103.9
SWT108[c]	4 m/s	-	68.1	77.1	81.8	85.4	85.6	82.2	74.8	70.5	90.5
	8 m/s	-	81.3	90.3	95.0	98.6	98.8	95.4	88.0	83.7	103.7
	10 m/s	-	86.6	95.6	100.3	103.9	104.1	100.7	93.3	89.0	109.0
SWT120[d]	4 m/s	-	85.5	85.5	85.5	85.5	85.5	85.5	85.5	85.5	94.5
	8 m/s	-	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4	105.4
	10 m/s	-	99.5	99.5	99.5	99.5	99.5	99.5	99.5	99.5	108.5
Sub. [e]	n/a	81.0	87.0	89.0	84.0	84.0	78.0	73.0	68.0	61.0	93.0

[a] Computed using specifications by Vestas for V110-2MW-Mk10C
[b] Computed using specifications by Vestas for V136-4.0/4.2MW-Mk3D
[c] Computed using specifications by Siemens for SWT-2.346-108 – 2.346 MW
[d] Computed using specifications by Siemens for SWT-2.625-120 – 2.625 MW
[e] From Ramboll sound source library for a GE Prolac Power Transformer

Note that the data presented in **Table 2** are based on sound power data provided by both Vestas and Siemens, in either 1/3 or 1/1 octave resolution, for noise generated at the nacelle for a range of wind speeds. These detailed noise specification data can be provided upon request.

5. Noise Assessment - Results

Using the methods described above in Section 4, noise modeling results were used to estimate project-related sound levels for the Vestas and Siemens WTG options under three (3) wind speed scenarios: 4 m/s, 8 m/s, and 10 m/s. Note that the substation was included with each scenario as a continuous sound source.

The following subsections summarize compliance with WAC limits and a comparison of results with the 2008 GEC study.

5.1 Compliance Assessment

The modeling results demonstrate that the project will comply with the 50-dBA nighttime noise limit applicable at residential receptors. Table 3 presents a summary of the highest sound levels modeled at any of the 88 residential receptor locations under the three modeled wind conditions for both Vestas and Siemens configurations. Detailed modeling results are presented in **Appendix A**. For Class C receptors (representing adjacent agricultural and silvicultural land), operation of either Vestas or Siemens options would be far below the 70-dBA limit, as detailed in **Appendix A**, for receptors R89 through R98.

Table 3. Noise Impact Assessment Results – WAC Compliance

Turbine Option	Highest Modeled Sound Level at Corresponding Turbine Wind Speed			Class C to Class A Nighttime Limit	Compliance with WAC
	4 m/s	8 m/s	10 m/s		
Vestas	28.1	39.3	40.2	50	Yes
Siemens	30.8	41.7	44.9	50	Yes

It is worth emphasizing that modeling was performed using manufacturer specification data provided by Vestas and Siemens. When relying upon manufacturer data, that may include a degree of uncertainty, we generally recommend using a conservative safety factor, rather than designing a project up to the regulatory noise limit. In order to increase the confidence of compliance with the residential 50 dBA regulatory limit, we would recommend that modeled noise levels not exceed 48 dBA, assuming an approximately 2-dBA level of uncertainty. In this case, the highest noise modeling results, as presented in Table 3, are less than 48 dBA for both Vestas and Siemens options. As presented in **Appendix A**, at most receptor locations, under all wind conditions, modeled results are well below 48 dBA.

5.2 Comparison With 2008 GEC Study

Table 4 provides a comparison of the current modeling results, both of the Vestas and Siemens turbine options, with the 2008 GEC study. Note that the GEC study predicted project sound levels at 37 locations based on a wind speed of 8 m/s, and so the results presented in **Table 4** are based on noise model results at a wind speed of 8 m/s only. As summarized in this table, the turbine configurations currently being contemplated result in noise levels that are less than or equal to the levels modeled by GEC in 2008. For many receptors, project noise levels are expected to be substantially less than modeled in 2008.

Table 4. Comparison of Results with 2008 GEC Study

2008 GEC Residence ID	2018 Ramboll Residence ID	2008 Predicted Project Sound Levels [a]	2018 Vestas Predicted Project Sound Levels [a]	
			Vestas	Siemens
1	R29	38	34	38
2	R30	38	34	38
3	R31	38	34	38
4	R32	38	34	38
5	R51	40	36	40
6	R50	41	36	40
7	R49	39	35	39
8	R12	38	32	36
9	R53	41	36	39
10	R33	39	36	39
11	R16	37	30	33
12	R26	41	36	39
13	R34	39	36	39
14	R35	40	34	39
15	R41	40	31	34
16	R36	41	34	38
17	R03	44	38	41
18	R17	35	23	28
19	R19	38	20	23
20	R48	42	33	36
21	R06	44	39	42
22	R18	39	19	22
23	R52	44	33	37
24	R20	40	20	22
25 [b]	R01	48	28	32
26	R10	46	39	40
27	R02	49	36	38

Table 4. Comparison of Results with 2008 GEC Study

2008 GEC Residence ID	2018 Ramboll Residence ID	2008 Predicted Project Sound Levels [a]	2018 Vestas Predicted Project Sound Levels [a]	
			Vestas	Siemens
28	R05	45	37	39
29	R11	47	35	37
30	R1	45	28	32
31	R24	44	37	39
32	R23	46	35	37
33	R22	46	34	37
34	R22	45	34	37
35	R39	45	38	41
36	R04	42	26	30
37	R40	44	36	39

Notes:

[a] WTG noise emissions at 8 m/s

[b] GEC Residence ID 25 was not modeled by Ramboll because there were no existing sensitive receivers at this location. The nearest Ramboll receptor, R1 at approximately 2,440 feet from this location, was used for comparison.

5.3 Summary

The revised project will comply with the Site Certification Agreement and WAC 173-60 at all receptor locations. Project sound levels associated with the revised project configurations are expected to be less than or equal to sound levels modeled for the previously permitted project.

6. References

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Appendix A

Noise Modeling Results Table

Table F1. Noise Assessment Results – Vestas

Receptor ID [a]	Land Use [b, c]	Project Only Noise Levels by Wind Speed, Vestas Option [d]		
		4 m/s	8 m/s	10 m/s
R01	Residential	18	28	29
R02	Residential	27	36	37
R03	Residential	27	38	39
R04	Residential	17	26	27
R05	Residential	27	37	38
R06	Residential	29	39	40
R07	Residential	15	23	24
R08	Residential	12	22	23
R09	Residential	17	25	26
R10	Residential	28	39	40
R11	Residential	25	35	36
R12	Residential	22	32	33
R13	Residential	21	32	33
R14	Residential	21	32	33
R15	Residential	23	33	34
R16	Residential	20	30	31
R17	Residential	13	23	24
R18	Residential	8	19	19
R19	Residential	10	20	21
R20	Residential	10	20	20
R21	Residential	26	36	37
R22	Residential	24	34	35
R23	Residential	24	35	36
R24	Residential	27	37	38
R25	Residential	27	36	37
R26	Residential	25	36	37
R27	Residential	23	33	34
R28	Residential	26	37	37
R29	Residential	24	34	35
R30	Residential	24	34	35
R31	Residential	24	34	35
R32	Residential	24	34	35
R33	Residential	25	36	36
R34	Residential	25	36	37
R35	Residential	24	34	35
R36	Residential	23	34	35
R37	Residential	20	31	32

Table F1. Noise Assessment Results – Vestas

Receptor ID [a]	Land Use [b, c]	Project Only Noise Levels by Wind Speed, Vestas Option [d]		
		4 m/s	8 m/s	10 m/s
R38	Residential	24	34	35
R39	Residential	27	38	39
R40	Residential	25	36	37
R41	Residential	21	31	31
R42	Residential	25	36	37
R43	Residential	15	25	26
R44	Residential	17	27	28
R45	Residential	21	32	33
R46	Residential	18	29	30
R47	Residential	27	38	39
R48	Residential	22	33	33
R49	Residential	24	35	36
R50	Residential	26	36	37
R51	Residential	25	36	37
R52	Residential	22	33	34
R53	Residential	25	36	37
R54	Residential	27	38	39
R55	Residential	26	36	37
R56	Residential	27	37	38
R57	Residential	27	37	38
R58	Residential	25	36	37
R59	Residential	25	35	36
R60	Residential	25	35	36
R61	Residential	25	35	36
R62	Residential	24	35	36
R63	Residential	24	34	35
R64	Residential	24	34	34
R65	Residential	19	28	29
R66	Residential	26	37	38
R67	Residential	24	35	35
R68	Residential	23	34	34
R69	Residential	11	21	22
R70	Residential	14	24	24
R71	Residential	15	24	25
R72	Residential	14	24	25
R73	Residential	16	25	26
R74	Residential	11	21	22

Table F1. Noise Assessment Results – Vestas

Receptor ID [a]	Land Use [b, c]	Project Only Noise Levels by Wind Speed, Vestas Option [d]		
		4 m/s	8 m/s	10 m/s
R75	Residential	16	26	26
R76	Residential	14	24	25
R77	Residential	13	24	24
R78	Residential	25	36	37
R79	Residential	25	36	37
R80	Residential	24	35	36
R81	Residential	23	34	34
R82	Residential	23	34	35
R83	Residential	24	35	36
R84	Residential	11	21	22
R85	Residential	22	32	33
R86	Residential	22	32	33
R87	Residential	9	19	20
R88	Residential	13	23	24
R89	Agriculture/Silviculture	29	40	41
R90	Agriculture/Silviculture	32	44	45
R91	Agriculture/Silviculture	33	45	45
R92	Agriculture/Silviculture	34	45	46
R93	Agriculture/Silviculture	34	46	46
R94	Agriculture/Silviculture	31	42	43
R95	Agriculture/Silviculture	30	41	42
R96	Agriculture/Silviculture	27	38	39
R97	Agriculture/Silviculture	28	39	40
R98	Agriculture/Silviculture	35	46	47

Notes

(a) Receptor ID based on 2018 model receptor number

(b) Nighttime noise limits based for R01 through R88 based on WAC 173-60-040 for industrial (Class C) sources affecting residential (Class A) receivers: 50 dBA

(c) Nighttime noise limits based for R89 through R98 based on WAC 173-60-040 for industrial (Class C) sources affecting industrial (Class C) receivers: 70 dBA

(d) Vestas option considered 5 Vestas V110 (80m tall turbines) and 25 Vestas V136 (82 m tall turbines)

Table F2. Noise Assessment Results – Siemens

Receptor ID [a]	Land Use [b, c]	Project Only Noise Levels by Wind Speed, Vestas Option [d]		
		4 m/s	8 m/s	10 m/s
R01	Residential	21	32	35
R02	Residential	28	38	42
R03	Residential	30	41	44
R04	Residential	20	30	33
R05	Residential	28	39	42
R06	Residential	31	42	45
R07	Residential	16	26	29
R08	Residential	15	26	29
R09	Residential	19	29	33
R10	Residential	29	40	43
R11	Residential	26	37	41
R12	Residential	25	36	39
R13	Residential	25	36	39
R14	Residential	25	36	39
R15	Residential	25	36	39
R16	Residential	22	33	36
R17	Residential	17	28	31
R18	Residential	10	22	25
R19	Residential	12	23	26
R20	Residential	12	22	26
R21	Residential	29	40	43
R22	Residential	26	37	40
R23	Residential	26	37	40
R24	Residential	28	39	43
R25	Residential	28	38	42
R26	Residential	28	39	42
R27	Residential	26	37	40
R28	Residential	28	39	43
R29	Residential	27	38	41
R30	Residential	27	38	41
R31	Residential	28	38	41
R32	Residential	28	38	41
R33	Residential	28	39	42
R34	Residential	28	39	42
R35	Residential	28	39	42
R36	Residential	28	38	42
R37	Residential	25	35	39

Table F2. Noise Assessment Results – Siemens

Receptor ID [a]	Land Use [b, c]	Project Only Noise Levels by Wind Speed, Vestas Option [d]		
		4 m/s	8 m/s	10 m/s
R38	Residential	28	39	42
R39	Residential	30	41	45
R40	Residential	29	39	42
R41	Residential	23	34	37
R42	Residential	29	40	43
R43	Residential	19	30	33
R44	Residential	21	32	35
R45	Residential	25	36	39
R46	Residential	22	33	36
R47	Residential	30	41	44
R48	Residential	25	36	39
R49	Residential	28	39	42
R50	Residential	29	40	43
R51	Residential	29	40	43
R52	Residential	26	37	40
R53	Residential	28	39	42
R54	Residential	30	41	44
R55	Residential	28	38	42
R56	Residential	28	39	43
R57	Residential	28	39	42
R58	Residential	27	38	41
R59	Residential	27	38	41
R60	Residential	27	37	41
R61	Residential	27	38	41
R62	Residential	26	37	41
R63	Residential	26	37	40
R64	Residential	26	36	40
R65	Residential	20	31	34
R66	Residential	27	38	42
R67	Residential	27	38	41
R68	Residential	26	37	40
R69	Residential	13	24	27
R70	Residential	15	26	29
R71	Residential	16	27	30
R72	Residential	15	26	30
R73	Residential	18	28	32
R74	Residential	14	25	29

Table F2. Noise Assessment Results – Siemens

Receptor ID [a]	Land Use [b, c]	Project Only Noise Levels by Wind Speed, Vestas Option [d]		
		4 m/s	8 m/s	10 m/s
R75	Residential	18	28	32
R76	Residential	16	27	31
R77	Residential	16	27	30
R78	Residential	29	39	43
R79	Residential	29	40	43
R80	Residential	28	39	42
R81	Residential	27	38	41
R82	Residential	27	38	41
R83	Residential	28	39	42
R84	Residential	13	23	27
R85	Residential	25	35	39
R86	Residential	25	35	39
R87	Residential	14	25	28
R88	Residential	17	28	31
R89	Agriculture/Silviculture	32	43	46
R90	Agriculture/Silviculture	38	49	52
R91	Agriculture/Silviculture	37	48	51
R92	Agriculture/Silviculture	36	47	50
R93	Agriculture/Silviculture	37	48	51
R94	Agriculture/Silviculture	33	44	47
R95	Agriculture/Silviculture	34	44	48
R96	Agriculture/Silviculture	32	43	46
R97	Agriculture/Silviculture	31	42	45
R98	Agriculture/Silviculture	35	46	49

Notes

(a) Receptor ID based on 2018 model receptor number

(b) Nighttime noise limits based for R01 through R88 based on WAC 173-60-040 for industrial (Class C) sources affecting residential (Class A) receivers: 50 dBA

(c) Nighttime noise limits based for R89 through R98 based on WAC 173-60-040 for industrial (Class C) sources affecting industrial (Class C) receivers: 70 dBA

(d) Siemens option considered 27 Siemens 120 (85.1 m tall turbines) and 4 Siemens 108 (80 m tall turbines)