



EMD International A/S
www.emd.dk

Vesterhav Syd Wind Farm

**Noise Impact Assessment,
Following Bekendtgørelse nr. 135 07/02/2019**

27. APRIL 2020



Vesterhav Syd

RECIPIENT

Vattenfall Vindkraft
RU204A
SE-962 80
Jokkmokk

Attn. Merete Bertelsen

DATE

27 April 2020

PREPARED BY

EMD International A/S
Niels Jernes Vej 10
DK- 9220 Aalborg
T: + 45 96 35 44 44
E: emd@emd.dk

PRINCIPAL CONSULTANT

Thomas Sørensen
EMD-DK

APPROVED BY

Karina Bredelle
EMD-DK

DOCUMENT

190919_19105_C_2_TS_3

CLASSIFICATION

Commercial in confidence

DOCUMENT REVISIONS



Revision	Date	Report no.	Chapter(s)	Description of Purpose/Changes
0	16.12.2019	190919_19105_C_2_TS_0	All	Draft report
1	17.02.2020	190919_19105_C_2_TS_1	All	Final report, revised source noise data
2	14.04.2020	190919_19105_C_2_TS_2	All	Final report, accepted
3	27.04.2020	190919_19105_C_2_TS_3	All	Final report, revised source noise data

KEY TO DOCUMENT CLASSIFICATION

Classification	
Strictly Confidential:	Recipients only
Private and Confidential:	For disclosure to individuals directly concerned within the recipient's organisation
Commercial in Confidence:	Not to be disclosed outside the recipient's organisation
Client's Discretion:	Distribution at the discretion of the client subject to contractual agreement
Published:	Available to the general public

LIABILITIES

EMD International A/S (EMD) does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used.

For any claim whatsoever related to the subject matter of this consultancy job, the liability of EMD for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD for the services provided as part of this consultancy job. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.



1 Executive Summary

This report presents the results of the noise assessment for the Vesterhav Syd wind farm project in Denmark . The project consists of 20 Siemens-Gamesa SG-8.4-167-DD wind turbines with 109 m hub height.

The calculation methods follow the current Danish regulation (Bekendtgørelse nr. 135 07/02/2019 from the Danish Environmental Agency) [1].

The calculations are performed for both normal and low frequency noise. It is checked that the calculated noise level at neighbors to operating wind turbines situated in the zone inside of the exclusion line is below the allowed threshold. The exclusion line for the normal noise outlines the zone within which the noise contribution from the new wind farm is above the noise thresholds minus 15 dB (commonly used value). For the low frequency noise, the usual 15 dB delimitation interpreted from the guideline [2] has proven to be unnecessarily conservative. Instead, a 10 dB criteria has been applied.

Finally for both the normal and low frequency noise, the noise immision of Vesterhav Syd wind farm complies with the Danish Regulation, bekendtgørelse nr. 135 07/02/2019.



Content

1	Executive Summary	3
2	Method.....	6
3	Data Basis	9
4	Normal Noise.....	11
4.1	15 dB Exclusion Line	11
4.2	Results Near Operating Wind Turbines	13
4.3	Results Normal Noise	14
5	Low Frequency Noise	15
5.1	15/10 dB Exclusion Lines	15
5.2	Results Near Operating Wind Turbines	17
5.3	Results Low Frequency Noise.....	20
6	References.....	23
	Appendix A. WindPRO calculation: Normal noise	24
	Appendix B. WindPRO calculation: Low Frequency noise.....	31



List of Figures

Figure 1 Noise threshold at dwellings for normal noise and low frequency noise	6
Figure 2. Source noise level (low frequency range)	9
Figure 3. Source noise level (normal frequency range).....	9
Figure 4. 15 dB exclusion lines at 6 m/s for normal noise.....	12
Figure 5. 15 dB exclusion lines at 8 m/s for normal noise.....	13
Figure 6. Normal range noise calculation at 6 and 8 m/s.....	14
Figure 7. Delimitation of the 15 dB exclusion line for regular dwellings (blue) and cottage zones (red) at 8 m/s (calculated for low frequency noise) with already operating turbines.....	16
Figure 8. Delimitation of the 10 dB exclusion line for regular dwellings (blue) and cottage zones (red) at 8 m/s with already operating turbines.....	17
Figure 9. Overview map of cottage zones (green) within/close to the 10 dB line at 8 m/s.....	18
Figure 10. Overview map with the identified areas where the impact at neighbors to operating wind turbines should be considered (Cottage zones marked with green color).....	19
Figure 11. Calculated low frequency noise from new and operating turbines at relevant calculation points – Hvide Sande. Low frequency threshold for standard dwellings (blue lines) and cottage zones (red lines) is shown. The red line traversing the map from north to south is the 10 dB exclusion line for cottage zones.	20
Figure 12. Low Frequency noise calculation results for regular dwellings (blue lines) and cottage zones (red lines) at 6 m/s. Cottage zones are marked with green color for clarity.....	21
Figure 13. Low Frequency noise calculation results for regular dwellings (blue lines) and cottage zones (red lines) at 8 m/s. Cottage zones are marked with green color for clarity.....	22

List of tables

Table 1. Value of the 15 dB and 10 dB delimitation of the exclusion lines for the different thresholds	7
--------------------------------------------------------------------------------------------------------------	---



2 Method

The noise thresholds and propagation model are described in “Bekendtgørelse nr. 135 07/02/2019” from the Danish Environmental Protection Agency [1].

Two types of noise thresholds are considered: for the normal noise in the range 63 Hz to 10 kHz and for low frequency noise from 10 Hz to 160 Hz. In both cases the aggregated dB(A) value at the receptors are compared to the noise threshold.

The noise thresholds for normal noise and low frequency noise are described below.

The noise impact from WTGs are not allowed to exceed the following limits: (Wind speeds in 10 m height)

- 1) At outdoor areas maximum 15 m from neighbor settlements in the open land.
 - a) 44 dB(A) at wind speed 8 m/s.
 - b) 42 dB(A) at wind speed 6 m/s.
- 2) At outdoor areas in residential or recreational areas.
 - a) 39 dB(A) at wind speed 8 m/s in residential areas.
 - b) 37 dB(A) at wind speed 6 m/s in residential areas.

The low frequency noise impact from WTGs are not allowed to exceed 20 dB indoor at wind speeds 8 and 6 m/s

Figure 1 Noise threshold at dwellings for normal noise and low frequency noise

The propagation model takes into account that the wind turbines are defined as offshore turbines. For offshore wind turbines, a lower ground attenuation is used than for onshore wind turbines. A transition zone at the coastline (200m) is then included, behind which onshore ground attenuation is used. Any water surface behind the coastline (between coastline and receptor) is considered land surface, meaning that the ground attenuation does not change back to offshore conditions.

From offshore wind turbines there is an additional contribution from multiple reflections introduced in the 2019 noise regulation. At each dwelling, the combined multiple reflection component of the noise is calculated assuming wind direction from the closest offshore wind turbine and a reduction in the contribution from multiple reflections from offshore turbines that are at an angle to the direction from the closest offshore wind turbine. The multiple reflections build up across water and upon crossing the coastline the multiple reflection contribution is maintained but not increased any further. Reentering water surface does not change multiple reflections. Onshore wind turbines do not contribute with multiple reflection and are not considered when determining the wind direction.

The calculation of normal frequency range noise impact is an outdoor calculation. The calculation point for dwellings in open land is closest outdoor area surrounding the building, facing the highest noise impact, though no more than 15 m from the inhabited building. For zones with increased noise protection any location within the zone must comply with the noise threshold and the calculation point will be the section on the periphery that receives the highest noise impact.

The calculation of low frequency noise is an indoor noise calculation that differentiate between regular dwellings and cottage zones, taking into account different values of insulation for the two types of receptors. The calculation is thus more conservative for cottage zones with lower insulation attenuation than for regular dwellings.

The calculation point of low frequency noise at cottage zones is defined as the closest point of a cottage zone to a planned or operating turbine. Cottage zones are identified from the official zoning plan



"Kommuneplanrammer, vedtaget" available at kort.plandata.dk from Erhverstyrelsen (ministry of Industry). Cottages or light dwellings not located in this particular zoning are considered regular dwellings.

The calculation point of low frequency noise at regular dwellings is defined as the closest point of a dwelling to a planned or operating turbine. As it is the case with domestic turbines (less than 25 kW), the dwelling of the owner of a turbine shall not be considered according to "Bekendtgørelse nr. 135 07/02/2019". Note that for domestic turbines, dwellings further than 500 m from the turbine have been ignored since the low frequency contribution becomes negligible (less than 10 dB(A)) at this distance.

According to the guideline for noise from wind turbines from the Environmental Agency [2], the noise impact from the planned wind farm will be irrelevant if it is less than 15 dB below the noise impact from operating wind turbines.

In order to identify which neighbors need to be re-assessed an exclusion line is drawn around the planned wind farm where the noise impact from the planned wind farm is 15 dB below threshold. A receptor outside this exclusion line will, if the noise received from wind turbines exceed the threshold, receive from the new wind farm less than 15 dB below what it is already receiving from operating wind turbines and can therefore be excluded from a reassessment. Reassessment of noise impact at neighbors will thus only have to be done inside the exclusion line.

The calculation of an exclusion line has been made in each of the cases (normal and low frequency noise). However, in the case of low frequency noise, the application of the 15 dB line would imply to evaluate the contribution of the low frequency noise from Vesterhav Syd to the low frequency noise from operating wind turbines close to summer houses more than 17 km away from Vesterhav Syd. This large distance seems too restrictive and not sensible (see section 5.1). Instead, a 10 dB exclusion line corresponding to a 10 dB difference between contributions from new and operating wind turbines is calculated. Details of the results are presented in the following sections.

The 15 dB (normal frequency range) and 10 dB (low frequency range) limitations of the exclusion lines related to the thresholds listed in Figure 1 are presented in Table 1.

Table 1. Value of the 15 dB and 10 dB delimitation of the exclusion lines for the different thresholds

Type of Demand	Threshold [dB(A)]	Exclusion line for threshold - 15 dB [dB(A)]	Exclusion line for threshold - 10 dB [dB(A)]
Normal noise, open land, 8m/s	44	29	/
Normal noise, open land, 6m/s	42	27	/
Normal noise, zones of increased noise protection, 8m/s	39	24	/
Normal noise, zones of increased noise protection, 6m/s	37	22	/
Low Frequency noise	20	(5)	10

Within the exclusion lines, the receptors to include in the calculation are identified as those where noise from operating turbine may approach the noise threshold relevant for the receptor in question.



It is more difficult to make a delimitation of which operating wind turbines can be excluded from the calculation. For receptors close to the new wind farm, the guideline [2] (which has until now been used as guideline for the interpretation of the regulations) states that individual operating wind turbines that contribute with less than 15 dB below the contribution of the combined new wind farm can be excluded. However, when considering neighbors to operating wind turbines, this guideline is less practical as the contribution from the new wind farm is relatively small, which would imply that operating turbines with even very small contributions cannot be excluded. In practice, a sensible evaluation of which operating turbines to include is made, including any turbines that could contribute significantly to the noise impact at the receptor. Those wind turbines may well be situated outside the exclusion line. In the present case, the offshore wind farm planned at Vesterhav Nord as well as Horns Rev3 is included although their contribution is minimal. The contributions from these wind farms are so small that normally they would be excluded. However, since the wind farms are located offshore and are subject to the new noise propagation model for offshore wind turbines, it has been the aim to avoid any doubt. By including Horns Rev 3 and Vesterhav Nord, the intention is to remove these as a potential item of contention.

All receptors and all wind turbines are calculated using the 2019 regulation no matter which regulation was used when they received their permit.

All the figures presented in this report uses symbols in red to represent a planned wind turbine (Vesterhav Syd), and blue to represent an operating turbine. Note that in this respect, Vesterhav Nord and Horns Rev 3 are also considered operating wind farms (with blue symbols).



3 Data Basis

The source noise levels of the wind turbines at Vesterhav Syd has been provided by Vattenfall in the form of a source noise specification from Siemens Gamesa [3], and are presented in Figure 2 and Figure 3. The noise data are based on measurements at Østerild National Test Center, conducted by SWECO, accredited by DANA for noise measurements.

WTG: Siemens SWT-8.0-167 8000 167.0 !O!

Noise: Standard+PB+HWRT - measured Østerild - 2020-03

Source Source/Date Creator Edited
Sweco 02/03/2020 USER 06/04/2020 10.02
Report No.: P6-006-20

Status	Hub height	Wind speed	Low frequency data													
			LwA,ref	10,0 Hz	12,5 Hz	16,0 Hz	20,0 Hz	25,0 Hz	31,5 Hz	40,0 Hz	50,0 Hz	63,0 Hz	80,0 Hz	100,0 Hz	125,0 Hz	160,0 Hz
From Windcat	109,10	6,0	93,9	47,0	53,2	58,9	65,0	69,2	73,2	77,0	80,0	84,9	84,0	85,5	87,7	88,7
From Windcat	109,10	8,0	98,5	50,6	57,1	63,1	68,6	74,4	78,0	81,8	84,8	87,1	92,3	90,0	91,9	92,5

Figure 2. Source noise level (low frequency range)

WTG: Siemens SWT-8.0-167 8000 167.0 !O!

Noise: Standard+PB+HWRT - measured Østerild - 2020-03

Source Source/Date Creator Edited
Sweco 02/03/2020 USER 06/04/2020 10.02
Report No.: P6-006-20

Status	Hub height	Wind speed	LwA,ref	Pure tones	Octave data							
					63	125	250	500	1000	2000	4000	8000
From Windcat	109,10	6,0	108,4	No	88,2	92,3	96,9	100,0	103,1	104,1	97,9	81,4
From Windcat	109,10	8,0	111,7	No	94,0	96,4	99,5	103,0	106,2	107,4	101,6	84,4

Figure 3. Source noise level (normal frequency range)

The Vesterhav Nord wind farm consists of the same wind turbine type, using the same Power Boost (PB) operation mode as Vesterhav Syd.

The Horns Rev 3 wind farm consists of 69 MHI Vestas V164 8.3MW wind turbines. Source noise values for these turbines has only been obtained as dB(A) sum values. These have been fitted to an octave band distribution typical for offshore wind turbines. This approach is not standard for noise calculations in Denmark, but given the marginal contribution of Horns rev 3, it was deemed a reasonable approach.

The operating onshore wind turbines are identified through the national register of wind turbines (Energistyrelsens stamdataregister). Specifically, for this calculation only 5 onshore wind turbines are included.

Three of these consist of three Vestas V112 wind turbines west of Hvide Sande town. The source noise data for these are based on measurements conducted by Grontmij, 2012 (Report P6.034.12).



One is a Vestas V52 located east of Hvide Sande town. The source noise data for this turbine is based on measurements conducted by Sweco, 2017 (Report P6.005.17). Any further noise reduction uses the standard specifications from Vestas.

The last existing wind turbine is a Solid Wind Power SWP-25 located north of Hvide Sande by. The source noise data for this is based on measurements conducted by DELTA, 2014 (Report DANA 100/1771 Rev. 1-E).

The total source noise levels of all existing wind turbines are presented in Appendix A and Appendix B.



4 Normal Noise

4.1 15 dB Exclusion Line

Operating turbines have been identified in the vicinity of Vesterhav Syd wind farm (Figure 4 and Figure 5).

Any area to which the Vesterhav Syd turbines contribute with a noise impact of less than 15 dB below the relevant threshold is not considered for reassessment and therefore not included in the calculation. For dwellings in the open land, these areas must be within the red lines, for zones with increased noise protection these areas must be within the blue lines.

The figures also include the noise receptors facing Vesterhav Syd directly.

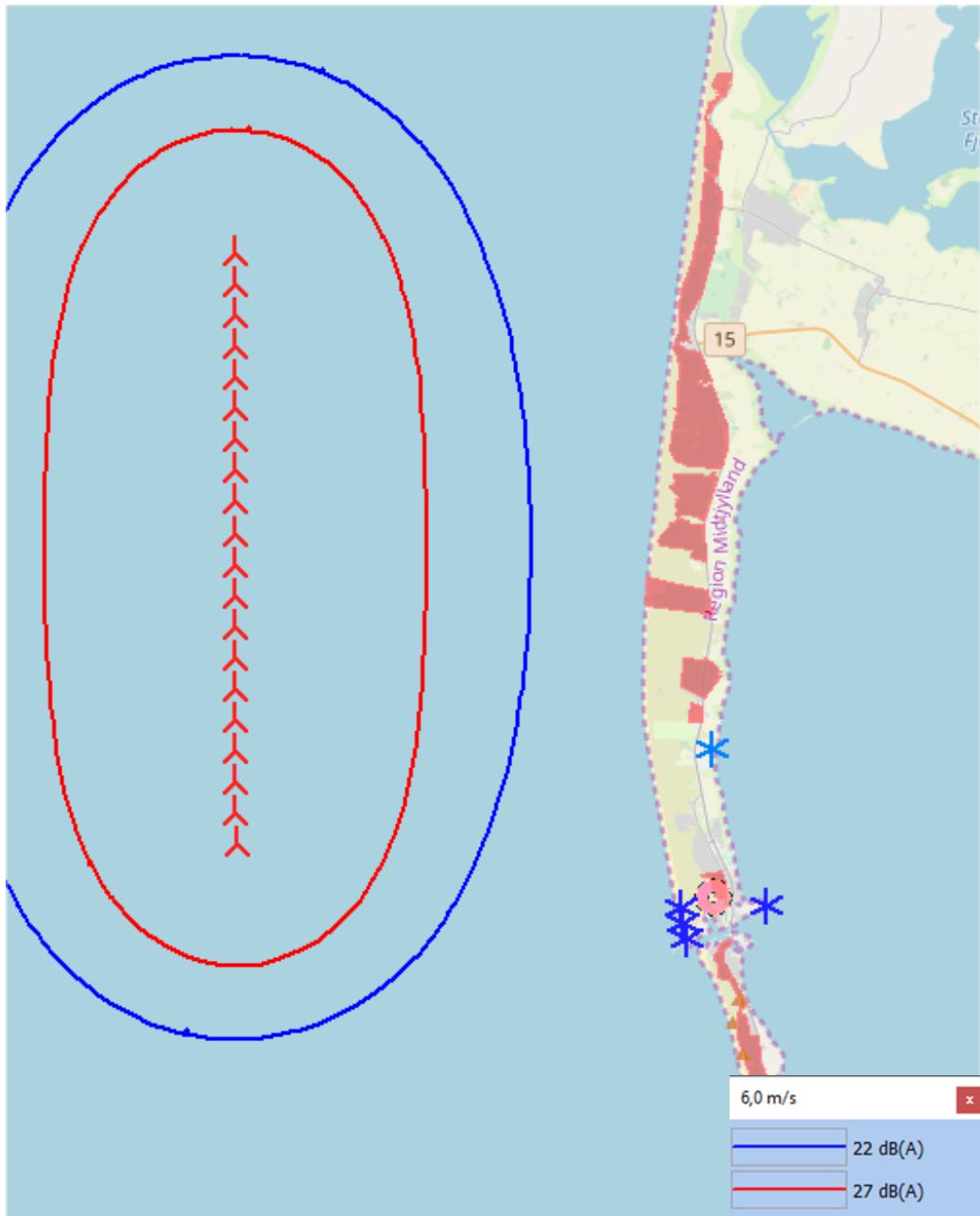


Figure 4. 15 dB exclusion lines at 6 m/s for normal noise.

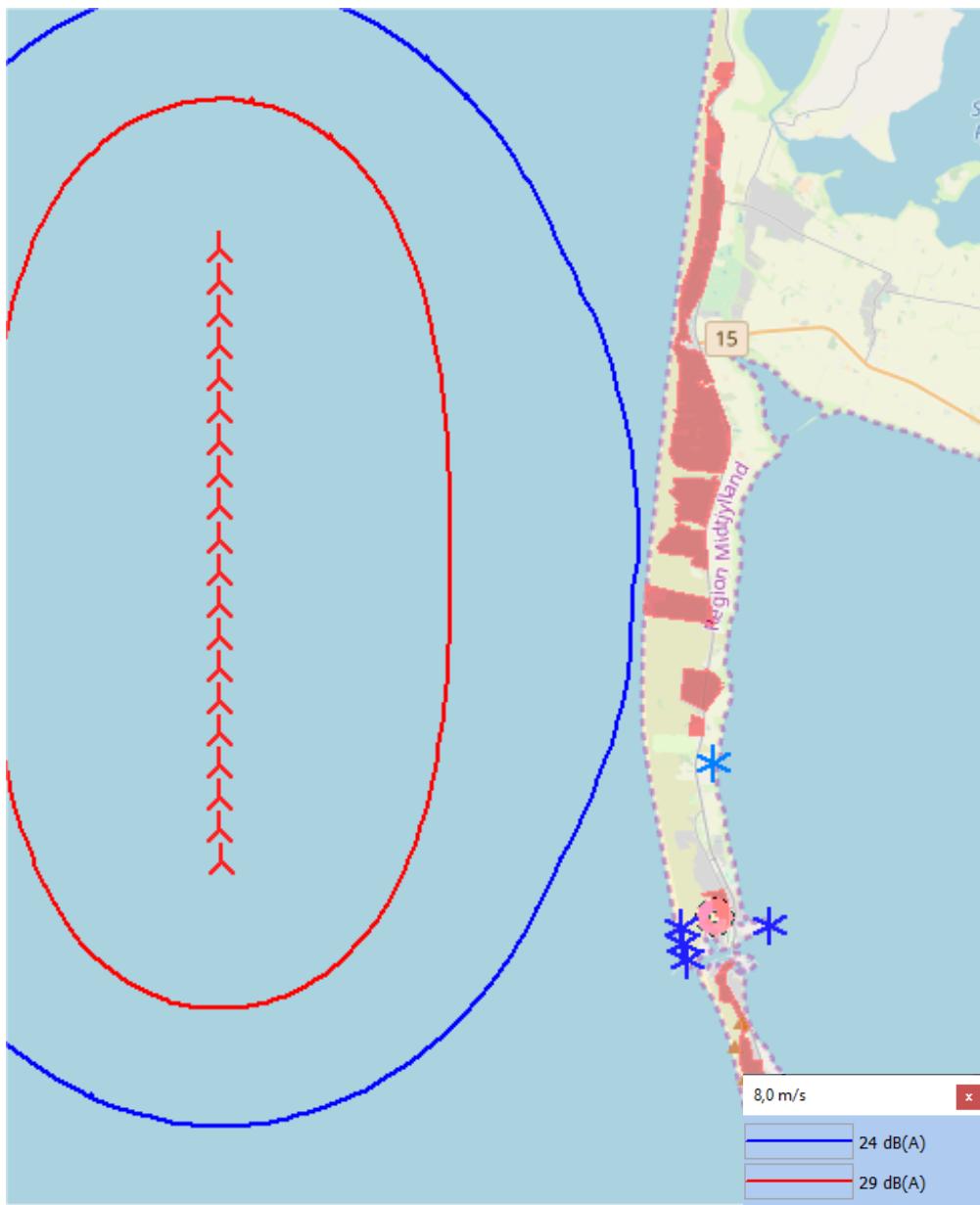


Figure 5. 15 dB exclusion lines at 8 m/s for normal noise.

4.2 Results Near Operating Wind Turbines

All neighbours to operating wind turbines are located outside the exclusion zones. Therefore no neighbours to operating wind turbines need to be reassessed.

4.3 Results Normal Noise

Since the calculated noise lines at noise threshold values (39 and 37 dB(A) respectively) are not reaching the coast, it can be concluded that the limits for the normal noise are (Figure 6) not exceeded. The highest noise level for a protected area along the coast is at Holmsland Klit cottage area with 24.5 dB(A) at 8 m/s while the Hvide Sande municipality area receives 36.9 dB(A) at 6 m/s, mostly from operating turbines.

The detailed calculation is presented in Appendix A.

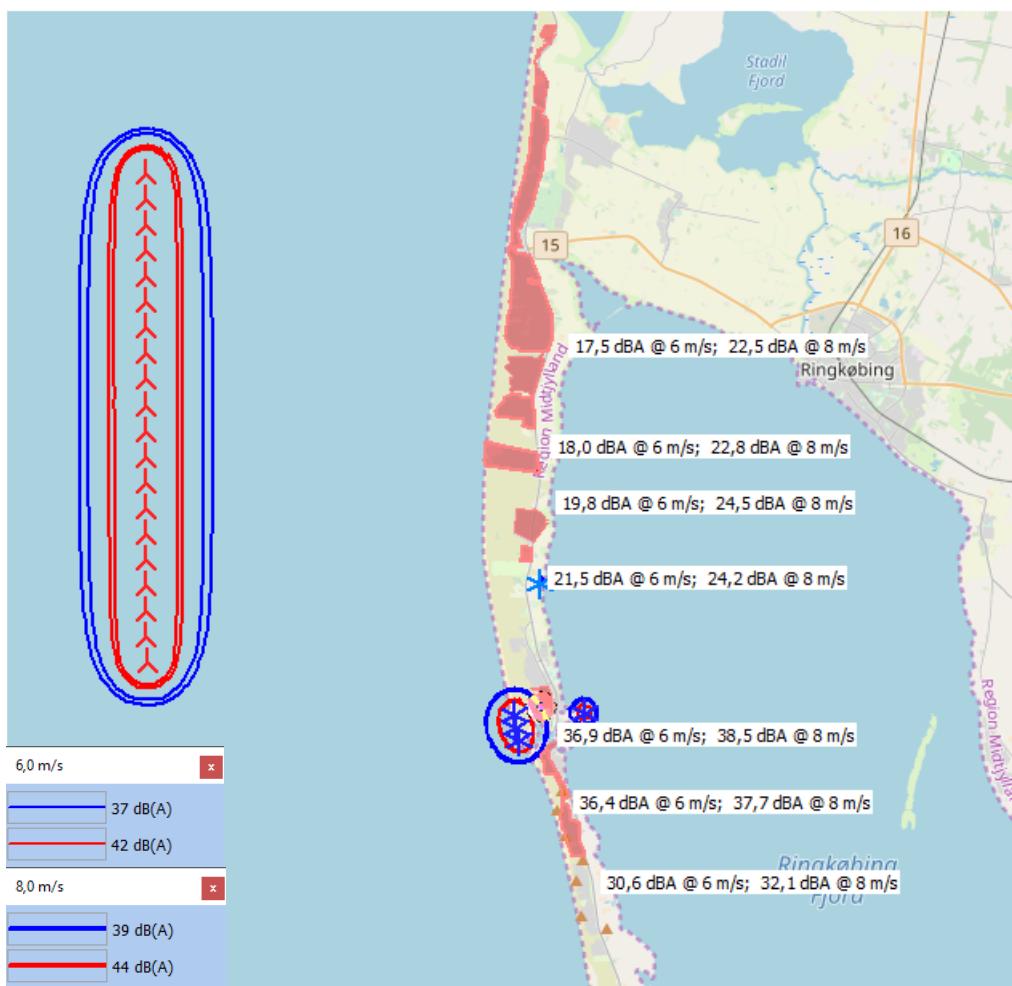


Figure 6. Normal range noise calculation at 6 and 8 m/s.



5 Low Frequency Noise

5.1 15/10 dB Exclusion Lines

The 10 dB and the 15 dB exclusion lines for low frequency noise around Vesterhav Syd are plotted on a map respectively in Figure 7 and Figure 8.

For the calculation of low frequency noise, a 15 dB exclusion criteria means that the zone within the exclusion line will include a large part of Western Jutland. Inside this very large zone, receptors near operating wind turbines will need to be reassessed. Particularly for low frequency noise in cottage zones, this area becomes very large (more than 17 km from Vesterhav Syd). It is our evaluation that it will not be relevant for the environmental impact to consider noise impact from Vesterhav Syd this far away from the wind farm.

The reasons for this are:

1. A low frequency noise contribution between 5 and 10 dB(A) will not likely be noticeable and is therefore not environmentally relevant.
2. A margin of 10 dB between the contribution from Vesterhav Syd and the contribution from the operating wind turbines is considered to provide an adequate protection of neighbors to operating wind turbines. Neighbors to operating wind turbines will indeed not notice any increase in low frequency noise impact with the addition of Vesterhav Syd wind farm when such a 10 dB margin is met.

We have therefore instead considered a less conservative 10 dB exclusion line. Outside this line, the contribution from Vesterhav Syd is below above 10 dB and thus at receptors where the combined low frequency noise impact reaches threshold, the margin between operating and new wind turbines is less than 10 dB.

A 10 dB(A) noise line delimiting a 10 dB exclusion line is thus calculated (Figure 8).

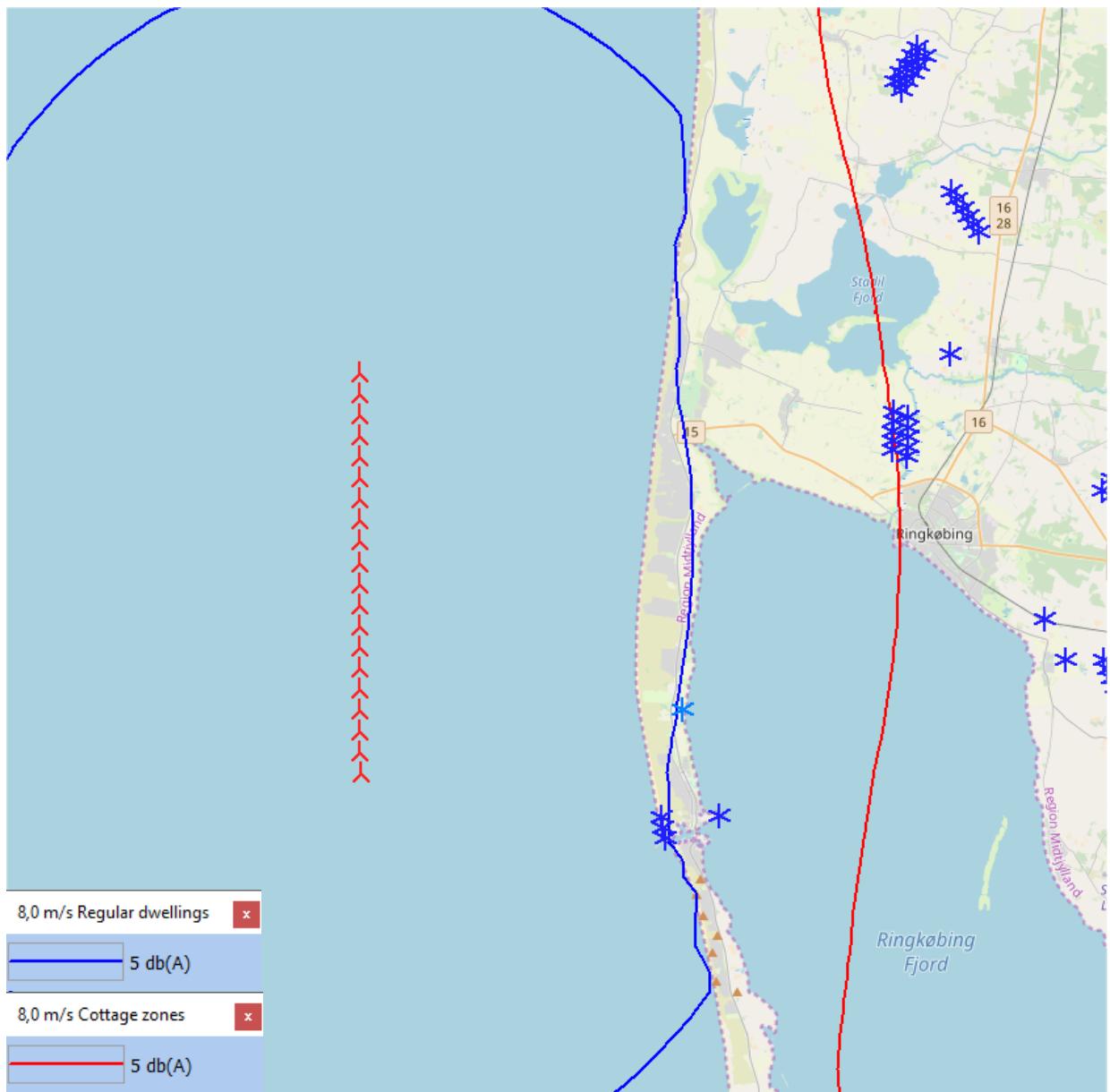


Figure 7. Delimitation of the 15 dB exclusion line for regular dwellings (blue) and cottage zones (red) at 8 m/s (calculated for low frequency noise) with already operating turbines.

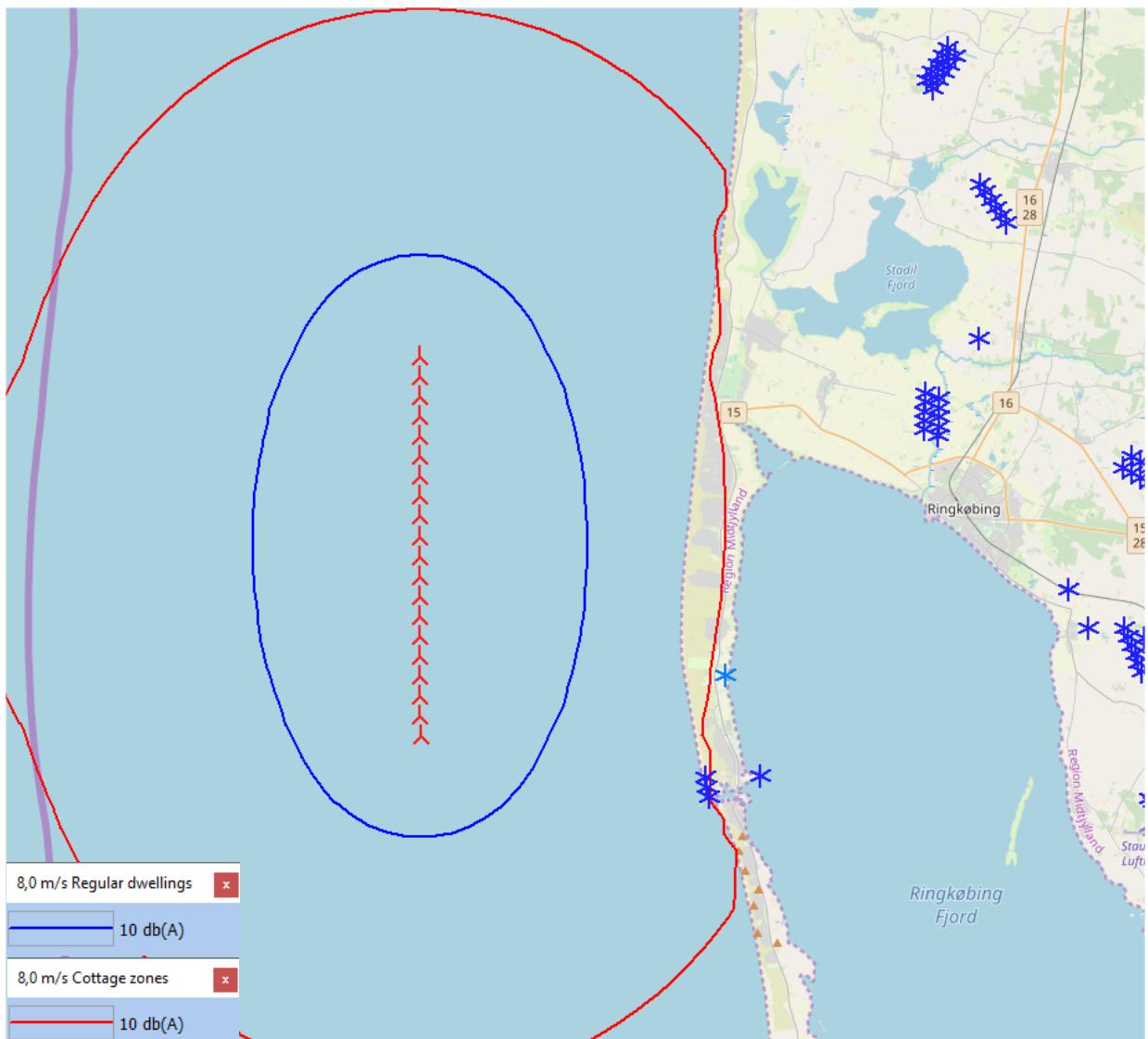


Figure 8. Delimitation of the 10 dB exclusion line for regular dwellings (blue) and cottage zones (red) at 8 m/s with already operating turbines.

Some operating turbines can be found within the two 10 dB exclusion lines. The largest zone is delimited by the red line and the coast. In this zone, cottage zones near operating turbines must be reassessed and the relevant operating wind turbines included in the calculation. The second zone, between the coast and the blue line, concerns the regular dwellings. In this zone any dwelling or noise sensitive area near operating turbines must be reassessed and the relevant operating wind turbines be included in the calculation. Only the five operating wind turbines near Hvide Sande town are relevant for the two types of receptors.

5.2 Results Near Operating Wind Turbines

The cottage zones within the 10 dB exclusion line have been identified and are presented in Figure 9. Those on the coastline and near operating wind turbines are selected for the analysis, including standard dwellings near operating turbines within the corresponding exclusion line (Figure 10). For clarity, cottage zones are given a green

color. As the exclusion line for standard dwellings does not reach the coastline, no standard dwellings next to operating wind turbines need to be reassessed. Those which are included in the assessment are so because they are closest neighbors on the coastline to the new wind farm. The exclusion line for cottage zones does reach the coastline, but cottage zones next to operating wind turbines are outside the exclusion line. Therefore these are only assessed as neighbors to the new wind farm.

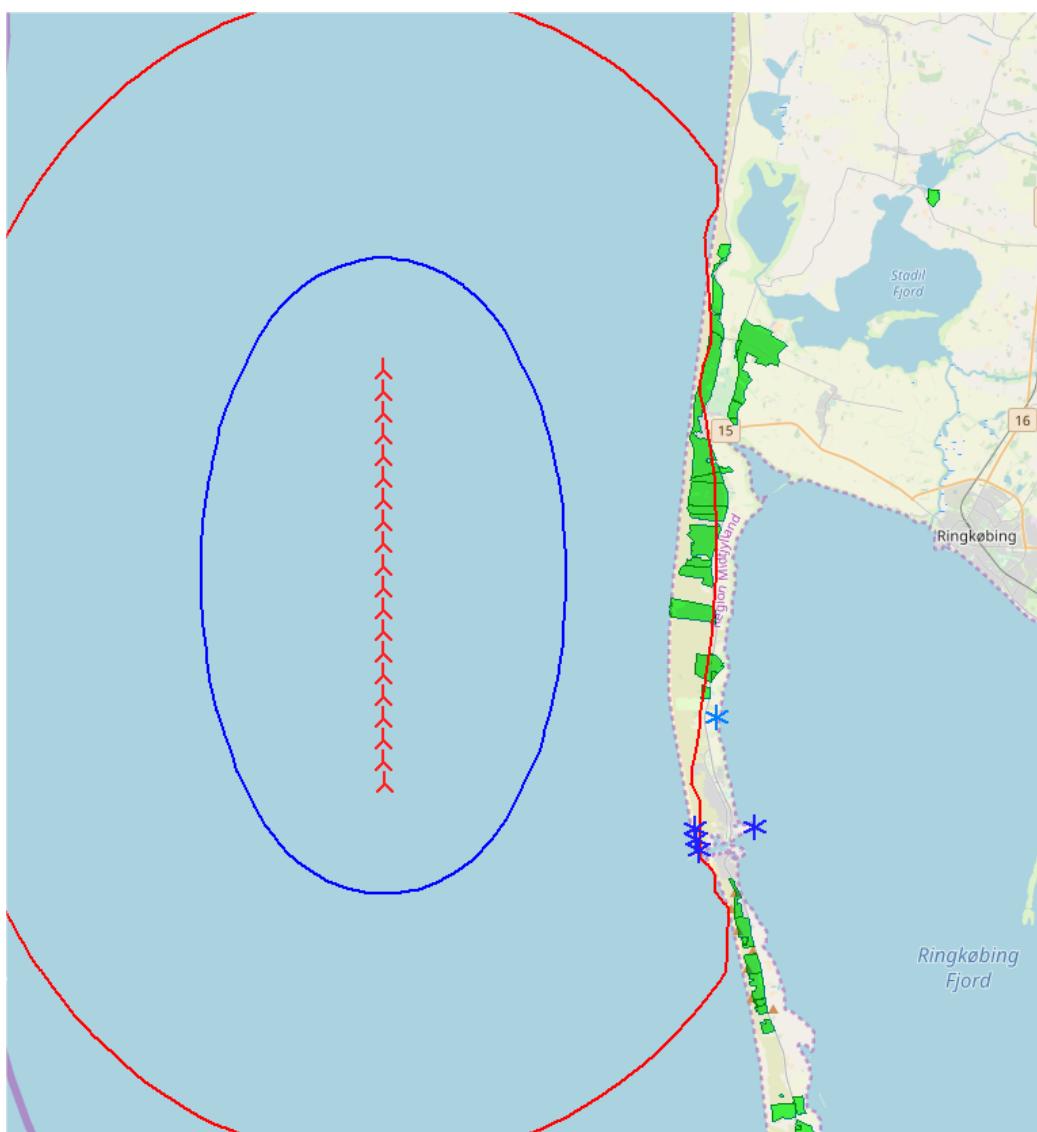


Figure 9. Overview map of cottage zones (green) within/close to the 10 dB line at 8 m/s.



Figure 10. Overview map with the identified areas where the impact at neighbors to operating wind turbines should be considered (Cottage zones marked with green color).

A detailed map of the Hvide Sande area is presented in the following figure (Figure 11), including the result of the cumulative noise impact (Vesterhav Syd, Vesterhav Nord, Horns Rev 3 and operating turbines) for the most relevant points of each receptor. Note again that the noise receptors are considered in their capacity as neighbors to the new farm, although the impact presented is cumulative impact. Critical noise impact at these dwellings would be caused by the operating turbines and trigger an exclusion (10 dB criteria).

North of Hvide Sande there is a small 25 kW wind turbine near a cottage zone, but the low frequency noise from this wind turbine is so low that noise contours are not even visible on the map. The same is the case for the Vestas V52 turbine east of Hvide Sande (The 400 m resolution in calculating the iso line noise map may be too crude for the noise lines from this turbine to be visible however the noise impact from these turbines are included in the calculation for the relevant dwellings). The neighbouring zones to the V52 wind turbine east of Hvide Sande are outside the exclusion line for regular dwellings and are therefore not reassessed. The noise lines around the V112 wind turbines are not approaching the cottage zones.

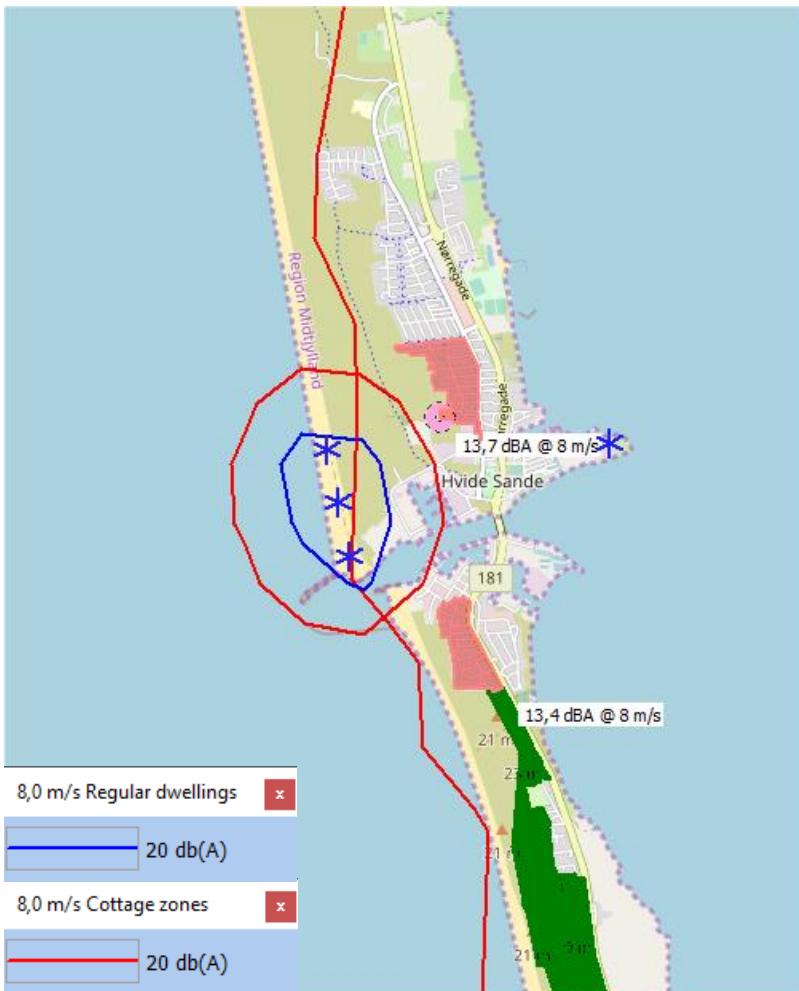


Figure 11. Calculated low frequency noise from new and operating turbines at relevant calculation points – Hvide Sande. Low frequency threshold for standard dwellings (blue lines) and cottage zones (red lines) is shown. The red line traversing the map from north to south is the 10 dB exclusion line for cottage zones.

5.3 Results Low Frequency Noise

Applying a 10 dB exclusion line to delimit the need for reassessment of low frequency noise from operating turbines has resulted in all neighbours to operating wind turbines being outside the exclusion line. No dwellings have been considered particularly as neighbour to operating wind turbine, but only as neighbour to the new wind farm. However, the cumulative noise from operating and new wind turbines has been assessed for these.

In terms of the calculation points on the coastline, the 20 dB threshold for regular dwellings or cottage zones does not reach the coastline. At Holmsland Klit cottage area, the low frequency noise impact at 8 m/s is 13.5 dB as the highest calculated mainly due to Vesterhav Syd. South of Hvide Sande, a total low frequency noise impact of 14.6 dB is calculated in a cottage zone, mostly from operating turbines.

It can thus be concluded that the thresholds for the low frequency noise are complied with.

The details of the calculation are presented in Appendix B.

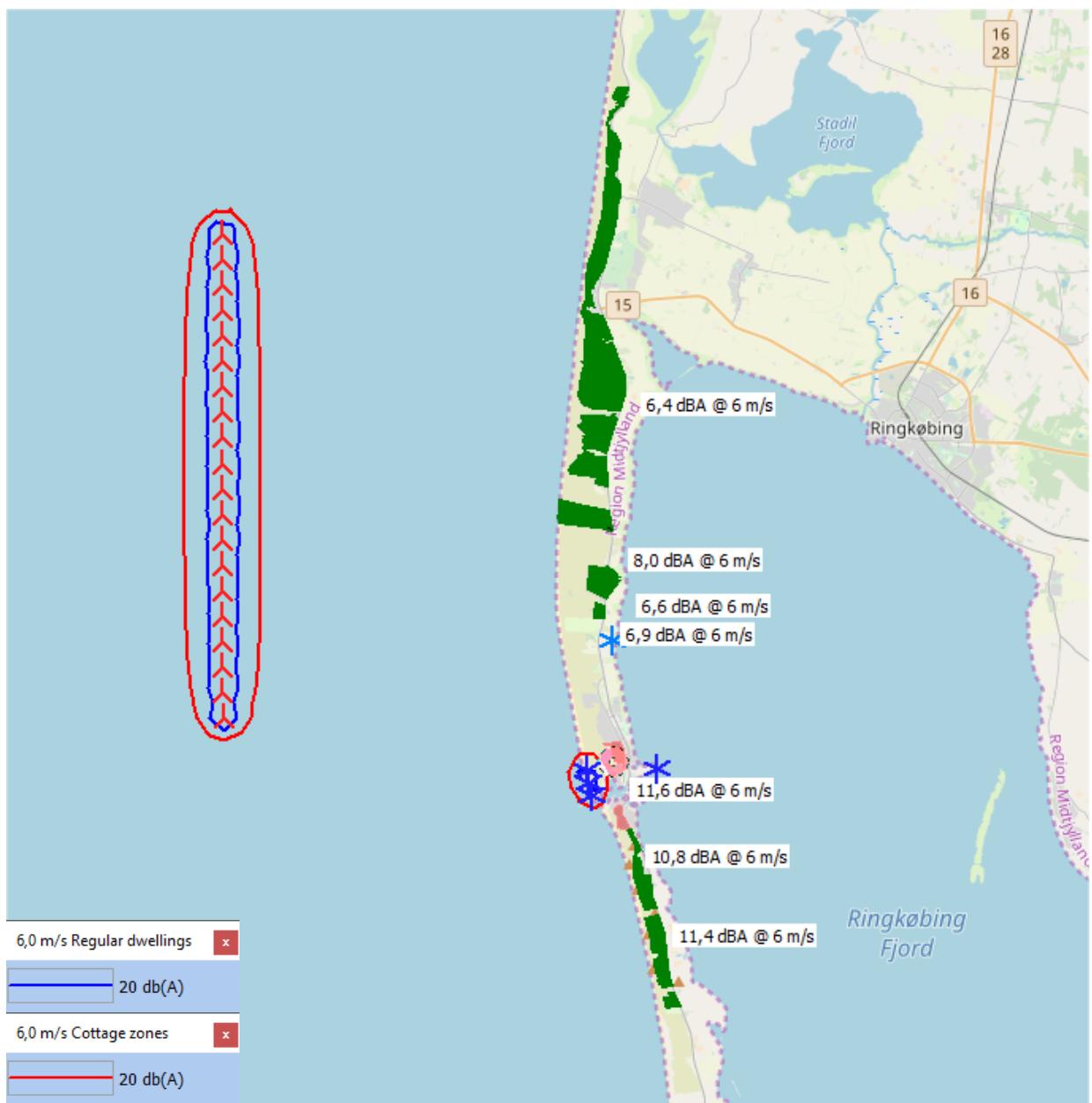


Figure 12. Low Frequency noise calculation results for regular dwellings (blue lines) and cottage zones (red lines) at 6 m/s. Cottage zones are marked with green color for clarity.

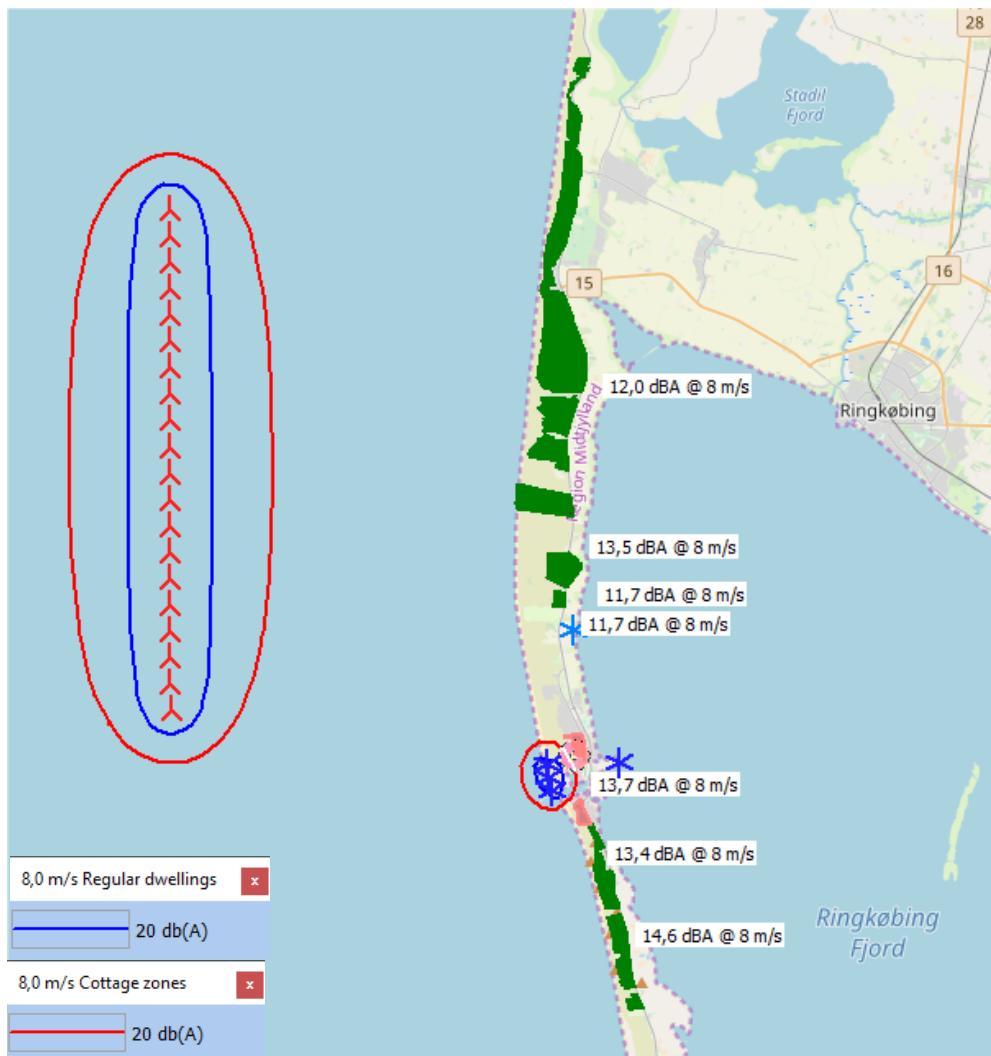


Figure 13. Low Frequency noise calculation results for regular dwellings (blue lines) and cottage zones (red lines) at 8 m/s. Cottage zones are marked with green color for clarity.



6 References

- [1] D. M. o. F. a. t. Environment, "Bekendtgørelse nr. 135 af 07/02/2019, Bekendtgørelse om støj fra Vindmøller, j.nr. 2018-5949," Lovtidende, 2019.
- [2] T. D. E. P. A. (Miljøstyrelsen), "Støj fra vindmøller, Vejledning fra Miljøstyrelsen nr. 1, 2012.", Miljøministeriet, 2012.
- [3] SWECO, "Wind Turbine Noise Measurement, IEC 61400-11 ED. 3.1, SG-8.6-167 DD Rev. 1 + PB + HWRT," 2020.



Appendix A. WindPRO calculation: Normal noise



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

06/04/2020 14.35/3.3.274

DECIBEL - Main Result**Calculation** Vesterhav syd normal VS measured + VN measured r1

Noise calculation model:

Danish 2019

The calculation is based on "BEK nr 135 af 07/02/2019" from the Danish Environmental Agency.
For wind turbines classified as offshore wind turbines multiple reflections (Um) are applied.

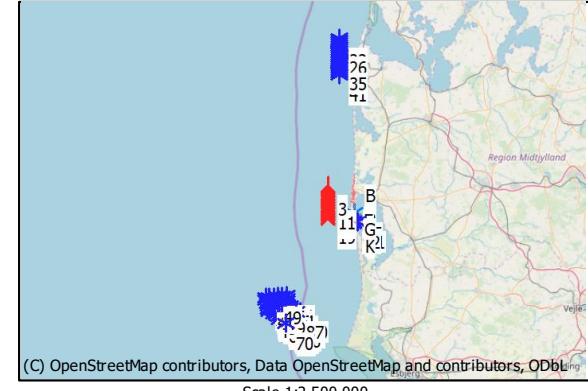
The noise impact from WTGs are not allowed to exceed the following limits: (Wind speeds in 10 m height)

- 1) At outdoor areas maximum 15 m from neighbor settlements in the open land.
 - a) 44 dB(A) at wind speed 3 m/s.
 - b) 42 dB(A) at wind speed 6 m/s.
- 2) At outdoor areas in residential or recreational areas.
 - a) 39 dB(A) at wind speed 8 m/s in residential areas.
 - b) 37 dB(A) at wind speed 6 m/s in residential areas.

The low frequency noise impact from WTGs are not allowed to exceed 20 dB indoor at wind speeds 8 and 6 m/s

The limits are not to be taken into account for houses belonging to WTG owner

All coordinates are in
UTM (north)-ETRS89 Zone: 32



Scale 1:2.500.000

New WTG

Existing WTG

Noise sensitive area

WTGs

Easting	Northing	Z	Row data/Description	WTG type	Valid	Manufacturer	Type-generator	Power, rated	Rotor diameter	Hub height	Offshore	Creator	Name	Noise data	First wind speed	LwAref	Last wind speed	LwAref	Pure tones
1	434.995,3	6.221.842,7	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03 [kW] [m] [m]	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
2	434.947,3	6.221.157,6	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
3	434.938,2	6.220.472,5	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
4	434.929,1	6.219.787,9	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
5	434.920,0	6.219.310,2	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
6	434.911,0	6.219.207,0	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
7	434.901,9	6.219.773,1	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
8	434.892,8	6.219.074,0	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
9	434.883,8	6.218.361,9	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
10	434.874,7	6.215.567,8	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
11	434.865,6	6.214.991,7	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
12	434.856,5	6.214.300,8	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
13	434.847,4	6.213.621,6	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
14	434.838,4	6.213.293,6	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
15	434.829,3	6.212.521,4	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
16	434.820,3	6.211.566,3	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
17	434.811,2	6.210.881,2	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
18	434.802,1	6.210.193,0	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
19	434.793,0	6.209.510,0	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
20	434.784,0	6.208.825,9	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
21	434.775,6	6.207.599,5	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
22	434.767,8	6.206.889,0	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
23	434.760,9	6.206.178,6	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
24	434.753,0	6.207.460,0	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
25	434.744,1	6.206.757,6	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
26	434.736,2	6.206.051,0	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
27	434.727,3	6.205.351,4	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
28	434.718,4	6.204.636,2	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
29	434.710,5	6.203.931,7	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
30	434.702,6	6.203.231,6	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
31	434.693,7	6.202.531,0	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
32	434.684,8	6.201.831,4	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
33	434.676,9	6.201.130,6	0,0 Siemens SWT-0,167 8000 167,0... Yes Siemens SWT-0,167 8,000 8,000 167,0 109,10 Yes USER Standard+Pb+Hw RT - measured Ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
34	434.668,0	6.200.430,0	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
35	434.660,1	6.200.731,4	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
36	434.652,2	6.200.031,0	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
37	434.643,3	6.200.331,6	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
38	434.634,4	6.200.631,0	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
39	434.626,5	6.200.931,6	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
40	434.617,6	6.200.600,5	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
41	434.609,7	6.200.300,0	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
42	434.591,8	6.200.601,6	0,0 Siemens SWT-0,167 8000 167,0... Yes VESTAS V144 300 8,000 164,0 107,0 Yes USER Standard+Pb+Hw RT - measured ørsterild - 2020-03	[m]	[m]	[m]									6,0 108,4	8,0 111,7	No		
43	434.583,9	6.200.903,2	0,0 Siemens SWT-0,167 8000 167																



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

06/04/2020 14.35/3.3.274

DECIBEL - Main Result**Calculation** Vesterhav syd normal VS measured + VN measured r1

...continued from previous page

Easting	Northing	Z	Row data/Description	WTG type Valid	Manufacturer	Type-generator	Power, rated	Rotor diameter	Hub height	Offshore	Operator	Noise data Name	First wind speed [m/s]	LwaRef	Last wind speed [m/s]	LwaRef	Pure tones
													[kW]	[m]	[m]	[dB(A)]	[dB(A)]
66	415.575,6	6.172.499,5	0,0	570/15000001613745: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
67	415.599,6	6.170.203,5	0,0	570/15000001613752: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
68	416.254,6	6.169.217,5	0,0	570/15000001613769: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
69	416.617,6	6.168.177,5	0,0	570/15000001613776: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
70	417.045,6	6.168.616,5	0,0	570/15000001613783: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
71	417.276,6	6.175.683,5	0,0	570/15000001613790: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
72	417.598,6	6.170.405,5	0,0	570/15000001613806: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
73	417.400,6	6.176.952,5	0,0	570/15000001613813: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
74	417.275,6	6.175.583,5	0,0	570/15000001613820: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
75	417.221,6	6.174.495,5	0,0	570/15000001613837: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
76	417.238,6	6.173.435,5	0,0	570/15000001613844: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
77	417.238,6	6.173.435,5	0,0	570/15000001613851: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
78	417.883,6	6.169.399,5	0,0	570/15000001613868: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
79	418.336,6	6.168.355,5	0,0	570/15000001613875: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
80	418.815,6	6.167.179,5	0,0	570/15000001613882: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
81	418.851,6	6.174.211,5	0,0	570/15000001613899: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
82	418.867,6	6.173.105,5	0,0	570/15000001613905: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
83	419.173,6	6.170.234,5	0,0	570/15000001613912: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
84	419.212,6	6.170.465,5	0,0	570/15000001613929: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
85	419.753,6	6.169.201,5	0,0	570/15000001613936: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
86	420.115,6	6.168.336,5	0,0	570/15000001613943: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
87	420.947,6	6.171.167,5	0,0	570/15000001613950: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
88	421.207,6	6.170.285,5	0,0	570/15000001613967: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
89	421.532,6	6.168.333,5	0,0	570/15000001613974: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
90	421.812,6	6.171.149,5	0,0	570/15000001613981: 8300 kW ...	Yes	VESTAS	V164.8.300	8.300	164,0	107,00	Yes	USER	107,1-111 estmet okvåbnd	6,0	107,1	8,0	111,0 No
91	446.492,6	6.207.213,5	1,8	570/1500000162978: 850 kW Ve... 26	Yes	VESTAS	V26-850	850	52,0	-49,00	USER	Measured P6005-17	6,0	98,4	8,0	99,5 No	
92	444.567,6	6.207.294,5	4,3	570/1500000162976: 850 kW Ve... 26	Yes	VESTAS	V112-3.0 MW 50/60 Hz-3.075	3.075	112,0	94,00	USER	Measured - Hvide Sande 3	6,0	103,5	8,0	104,8 No	
93	444.717,6	6.206.574,5	0,0	570/1500000162940: 3075 kW Ve... 26	Yes	VESTAS	V112-3.0 MW 50/60 Hz-3.075	3.075	112,0	94,00	USER	Measured - Hvide Sande 1	6,0	101,8	8,0	103,0 No	
94	444.639,8	6.206.934,5	5,0	570/150000000152757: 3075 kW Ve... 26	Yes	VESTAS	V112-3.0 MW 50/60 Hz-3.075	3.075	112,0	94,00	USER	Measured - Hvide Sande 2	6,0	103,3	8,0	105,6 No	
95	445.337,4	6.210.774,7	3,9	571313134080906110: 25 kW Soli... 26	Yes	Solid Wind Power	SWP-25-25	25	14,0	18,00	EMD	SWP-25	6,0	84,1	8,0	84,4 No	

Calculation Results**Sound level****Noise sensitive area**

No.	Name	Easting	Northing	Z	Immission height [m]	Wind speed [m/s]	Noise [dB(A)]	From WTGs [dB(A)]	Demands	Sound level	Demands fulfilled ?
A	Hvide Sande boligområde	445.326,3	6.207.492,7	5,2	1,5	6,0	37,0	36,9	Yes		
A						8,0	39,0	38,5	Yes		
B	Krogen sommerhusområde 1	445.313,2	6.223.568,1	0,0	1,5	6,0	37,0	14,9	Yes		
C	Howig sommerhusområde	444.587,6	6.219.581,1	2,5	1,5	6,0	37,0	17,5	Yes		
D	Tymose 1	444.465,3	6.216.548,4	5,0	1,5	6,0	37,0	17,4	Yes		
D						8,0	39,0	22,2	Yes		
E	Klegod sommerhusområde	444.186,8	6.215.365,0	5,0	1,5	6,0	37,0	18,0	Yes		
E						8,0	39,0	22,8	Yes		
F	Holmsland Klit sommerhusområde	443.849,8	6.214.031,9	7,5	1,5	6,0	37,0	19,8	Yes		
F						8,0	39,0	24,5	Yes		
G	Nørre Lyngvig sommerhusområde 1	445.138,7	6.211.849,7	2,7	1,5	6,0	37,0	19,5	Yes		
G						8,0	39,0	23,0	Yes		
H	Nørre Lyngvig sommerhus område 2	445.089,8	6.211.329,0	5,3	1,5	6,0	37,0	21,5	Yes		
H						8,0	39,0	24,2	Yes		
I	Hundested sommerhusområde	445.626,5	6.205.673,7	2,5	1,5	6,0	37,0	30,6	Yes		
I						8,0	39,0	32,1	Yes		
J	Hvide Sande centerområde	445.380,2	6.206.310,5	2,5	1,5	6,0	37,0	36,2	Yes		
J						8,0	39,0	37,6	Yes		
K	Hvide Sande boligområde 2	445.334,8	6.206.260,9	4,4	1,5	6,0	37,0	36,4	Yes		
K						8,0	39,0	37,7	Yes		
L	Hjørnet af matriklen, Dakotavej 23A	445.325,8	6.207.492,4	12,5	1,5	6,0	37,0	36,9	Yes		
L						8,0	39,0	38,5	Yes		

To be continued on next page...



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

06/04/2020 14.35/3.3.274

DECIBEL - Main Result**Calculation** Vesterhav syd normal VS measured + VN measured r1

...continued from previous page

WTG	A	B	C	D	E	F	G	H	I	J	K	L
11	12354	13517	9889	9725	9329	9035	10096	10522	14235	13608	13632	12871
12	11986	13968	10083	9853	9390	8997	9974	10341	13803	13199	13211	12492
13	11647	14434	10318	9996	9497	9012	9895	10202	13392	12814	12813	12139
14	11340	14918	10593	10183	9646	9078	9830	10103	13005	12451	12439	11816
15	11066	15416	10893	10412	9841	9195	9805	10033	12643	12108	12092	11525
16	10829	15928	11222	10680	10079	9360	9828	10008	12308	11796	11773	11268
17	10631	16450	11582	10984	10356	9572	9898	10028	12004	11515	11486	11047
18	10473	16984	11969	11320	10671	9827	10015	10091	11731	11269	11233	10865
19	10359	17528	12380	11686	11019	10122	10176	10200	11493	11060	11017	10724
20	10290	18082	12816	12080	11398	10454	10381	10354	11291	10891	10841	10626
21	71768	54252	56371	62929	63944	65170	67016	68003	74120	73272	73491	72288
22	71060	53546	55664	62221	63236	64461	66308	67294	73412	72564	72783	71579
23	70352	52840	54957	61512	62528	63752	65599	66586	72704	71855	72075	70871
24	69644	52133	54250	60804	61819	63043	64891	65877	71996	71147	71366	70163
25	68936	51427	53544	60096	61111	62334	64182	65169	71288	70439	70658	69455
26	68228	50721	52837	59387	60403	61625	63474	64461	70580	69731	69950	68747
27	67520	50016	52130	58679	59694	60916	62766	63752	69872	69023	69242	68038
28	66812	49310	51424	57971	58986	60207	62058	63044	69164	68315	68534	67330
29	66104	48605	50717	57263	58278	59499	61349	62336	68456	67607	67826	66622
30	65397	47899	50011	56555	57570	58790	60641	61628	67748	66899	67118	65914
31	64689	47194	49305	55847	56862	58081	59933	60920	67041	66192	66410	65207
32	63981	46489	48594	55139	56154	57372	59225	60212	66333	65484	65703	64499
33	63274	45784	47893	54431	55446	56664	58517	59504	65626	64776	64995	63791
34	62566	45079	47187	53724	54739	55955	57809	58797	64918	64069	64287	63083
35	61859	44375	46481	53016	54031	55247	57101	58089	64211	63361	63580	62376
36	61151	43671	45776	52308	53323	54538	56394	57381	63503	62653	62872	61668
37	60444	42967	45071	51601	52616	53830	55686	56673	62796	61946	62164	60960
38	59737	42263	44366	50893	51908	53121	54978	55966	62089	61239	61457	60253
39	59030	41559	43661	50186	51201	52413	54271	55258	61382	60531	60750	59546
40	58323	40856	42956	49479	50494	51705	53563	54551	60675	59824	60042	58838
41	57616	40152	42251	48772	49786	50997	52856	53844	59968	59117	59335	58131
42	47014	58517	53109	52231	51502	50360	49567	49180	45177	46315	45947	47013
43	47639	59329	53869	52979	52248	51093	5269	49869	45725	46921	46542	47639
44	47939	59841	54320	53415	52682	51514	50652	50238	49539	47199	46809	47938
45	48358	60462	54885	53966	53230	52050	51153	50724	46275	47597	47196	48357
46	48980	61243	55622	54692	53956	52765	51840	51400	46829	48202	47791	48979
47	49694	62100	56440	55501	54763	53564	52614	52164	47481	48901	48482	49694
48	48739	57463	51985	51091	50360	49202	48372	47970	43832	45021	44644	45738
49	44381	56375	50812	49899	49165	47990	47113	46693	42385	43639	43249	44380
50	45259	57372	51779	50858	50123	48941	48043	47614	43205	44503	44106	45258
51	46103	58342	52717	51787	51051	49861	48941	48503	43991	45333	44927	46102
52	46911	59280	53622	52684	51946	50749	49805	49358	44739	46127	45713	46911
53	47684	60187	54493	53546	52807	51602	50634	50178	45450	46884	46462	47683
54	48419	61059	55329	54373	53633	52420	51427	50961	46123	47604	47174	48418
55	49114	61893	56127	55161	54421	53199	52181	51705	46756	48284	47846	49113
56	43404	55299	49655	48723	47986	46794	45871	45433	40956	42275	41873	43040
57	43935	56307	50635	49696	48958	47759	46815	46370	41793	43156	42746	43934
58	45625	58242	52509	51553	50813	49601	48612	48149	43366	44818	44393	45625
59	46418	59163	53397	52433	51693	50473	49460	48988	44098	45596	45163	46417
60	47890	60902	55067	54085	53344	52109	51047	50555	45447	47039	46589	47890
61	48568	61716	55846	54855	54113	52871	51783	51281	46063	47702	47244	48568
62	49206	62490	56585	55585	54843	53593	52479	51967	46638	48324	47858	49205
63	41730	54257	48533	47582	46842	45634	44662	44207	39551	40941	40525	41729
64	42642	55276	49527	48569	47829	46615	45623	45159	40408	41840	41417	42642
65	43523	56271	50494	49528	48788	47567	46554	46082	41232	42707	42277	43522
66	45961	59077	53209	52219	51477	50235	49154	48655	43492	45102	44649	45961
67	47402	60777	54843	53836	53094	51838	50707	50189	44810	46514	46044	47401
68	48064	61571	55604	54588	53846	52583	51426	50898	45411	47161	46684	48063
69	48685	62323	56323	55298	54556	53287	52104	51566	45970	47767	47282	48684
70	49265	63035	57002	55969	55227	53951	52742	52194	46489	48333	47841	49265
71	49802	63703	57637	56595	55854	54571	53336	52778	46965	48856	48356	49802
72	40453	53252	47450	46479	45738	44513	43491	43017	38177	39639	39210	40453
73	41383	54283	48457	47479	46738	45508	44467	43985	39052	40555	40120	41382
74	42283	55290	49439	48455	47713	46477	45416	44926	39897	41443	41000	42283
75	43151	56270	50391	49400	48658	47416	46334	45835	40707	42297	41846	43150
76	43985	57221	51314	50316	49573	48325	47220	46713	41483	43117	42659	43984

To be continued on next page...



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

06/04/2020 14.35/3.3.274

DECIBEL - Main Result**Calculation** Vesterhav syd normal VS measured + VN measured r1

...continued from previous page

WTG	A	B	C	D	E	F	G	H	I	J	K	L
77	45818	59317	53347	52331	51588	50326	49170	48643	43186	44920	44445	45818
78	46523	60182	54171	53145	52403	51132	49945	49406	43816	45607	45123	46523
79	47399	61226	55174	54137	53395	52116	50895	50343	44610	46463	45969	47398
80	48252	62237	56147	55099	54359	53072	51819	51254	45387	47299	46795	48252
81	42527	55942	49984	48973	48230	46972	45832	45312	39961	41643	41176	42526
82	43388	56910	50927	49909	49166	47902	46742	46214	40767	42491	42017	43388
83	44454	58155	52129	51099	50357	49084	47888	47346	41744	43536	43051	44454
84	45184	59012	52955	51917	51175	49895	48674	48122	42411	44251	43758	45183
85	45896	59842	53757	52711	51970	50685	49440	48879	43064	44950	44449	45895
86	46570	60636	54522	53468	52728	51437	50167	49597	43680	45611	45103	46570
87	43341	57274	51187	50141	49400	48115	46872	46313	40535	42400	41903	43341
88	44137	58188	52073	51020	50280	48989	47722	47153	41270	43182	42677	44136
89	44875	59037	52897	51836	51097	49801	48511	47933	41952	43907	43395	44875
90	42498	56700	50545	49481	48743	47445	46145	45565	39573	41529	41016	42498
91	852	16125	9666	8538	7651	6458	4724	4242	1786	1170	1419	1146
92	784	16154	9689	8486	7590	6426	4591	4052	1936	1223	1287	784
93	1105	16865	10400	9196	8298	7127	5292	4765	1284	719	696	1104
94	885	16509	10044	8840	7943	6775	4940	4408	1601	963	968	884
95	2754	12644	6172	4988	4087	2899	1093	607	5105	4259	4481	3282



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

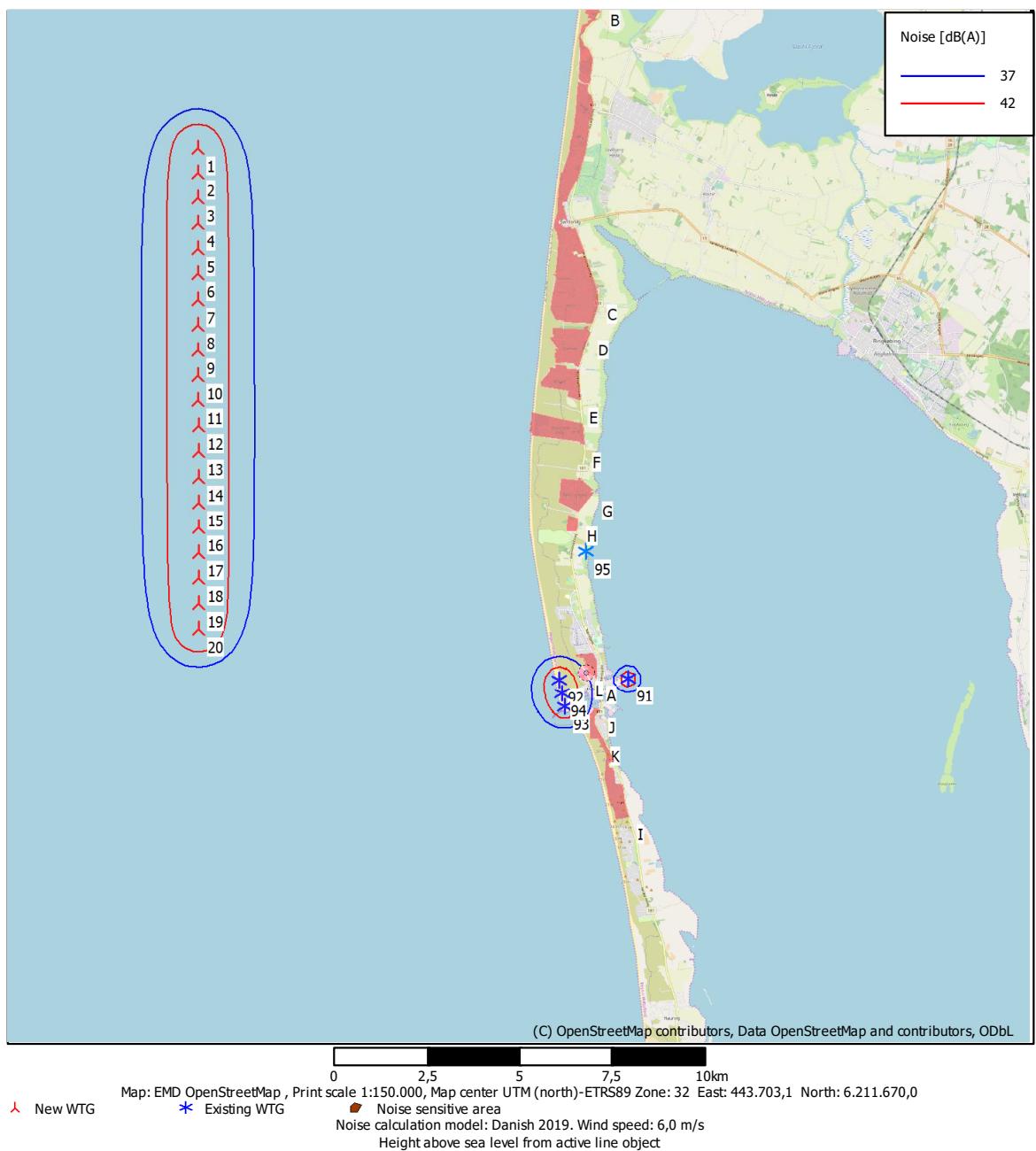
Thomas Sørensen / ts@emd.dk

Calculated:

06/04/2020 14.35/3.3.274

DECIBEL - Map 6,0 m/s

Calculation Vesterhav syd normal VS measured + VN measured r1





Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

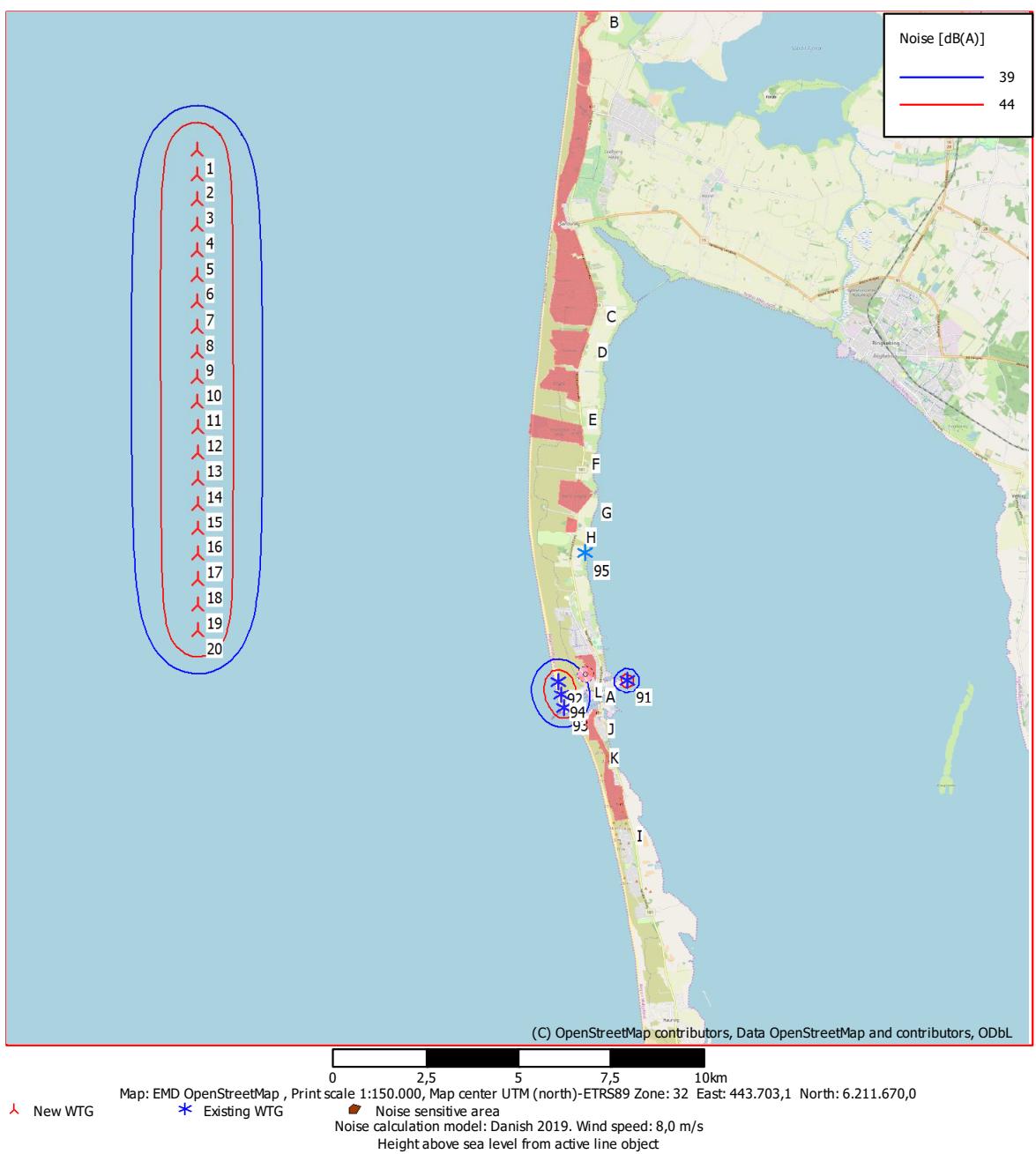
DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

06/04/2020 14.35/3.3.274

DECIBEL - Map 8,0 m/s**Calculation** Vesterhav syd normal VS measured + VN measured r1



Appendix B. WindPRO calculation: Low Frequency noise



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

07/04/2020 07.16/3.3.274

DECIBEL - Main Result**Vesterhav Syd LF VS measured + VN measured r1**

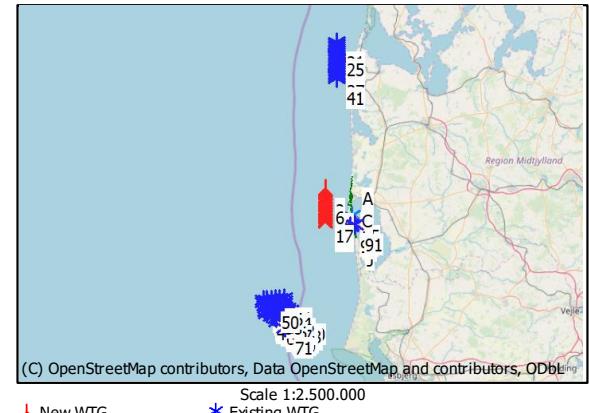
Noise calculation model:

Danish low frequency 2019

The noise impact from WTGs are not allowed to exceed the following limits: (Wind speeds in 10 m height)

- 1) At outdoor areas maximum 15 m from neighbor settlements in the open land.
 - a) 44 dB(A) at wind speed 8 m/s.
 - b) 42 dB(A) at wind speed 6 m/s.
- 2) At outdoor areas in residential or recreational areas.
 - a) 39 dB(A) at wind speed 8 m/s in residential areas.
 - b) 37 dB(A) at wind speed 6 m/s in residential areas.

The low frequency noise impact from WTGs are not allowed to exceed 20 dB indoor at wind speeds 8 and 6 m/s

The limits are not to be taken into account for houses belonging to WTG owner
Den lavfrekente støj beregnes indendøre og må ikke overstige 20 dB ved vindhastigheder på 6 og 8 m/s i 10 m højdeAll coordinates are in
UTM (north)-ETRS89 Zone: 32

Scale 1:2,500,000

New WTG Existing WTG
Noise sensitive area**WTGs**

Easting	Northing	Z	Row data/Description	WTG type Valid Manufact.	Type-generator	Noise data				First wind speed [m/s]	LwaRef wind [dB(A)]	Last wind speed [m/s]	LwaRef wind [dB(A)]
						Power rated [kW]	Rotor diameter [m]	Hub height [m]	OffshoreCreatorName				
1434.956	5.221.842	7.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
2343.947	5.221.157	6.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
3343.938	5.220.472	5.5	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
4343.929	5.219.787	4.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
5343.920	5.219.102	3.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
6343.911	5.218.418	2.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
7343.901	5.217.732	1.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
8343.892	5.217.047	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
9343.883	5.217.361	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
10343.874	5.215.676	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
11343.865	5.214.991	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
12343.856	5.214.303	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
13343.847	5.213.621	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
14343.838	5.212.941	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
15343.829	5.212.251	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
16343.820	5.211.566	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
17343.811	5.210.881	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
18343.802	5.210.190	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
19343.793	5.209.511	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
20343.784	5.208.825	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
21343.775	5.207.139	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
22344.023	5.278.889	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
23344.0208	5.278.178	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
24344.0204	5.277.468	1.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
25344.0199	5.276.757	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
26344.0194	5.276.047	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
27344.0189	5.275.336	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
28344.0182	5.274.620	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
29344.0175	5.273.915	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
30344.0174	5.273.205	2.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
31344.0169	5.272.494	7.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
32344.0164	5.271.784	3.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
33344.0160	5.270.703	1.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
34344.0155	5.269.652	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
35344.0150	5.268.995	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
36344.0149	5.268.330	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
37344.0146	5.268.231	3.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
38344.0140	5.267.521	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
39344.0130	5.266.810	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
40344.0125	5.266.100	0.0	0.0 Siemens SWT-8.0-167 8000 19s. Siemens	SWT-8.0-167-8.000	SWT-8.0-167-8.000	8.000	167.0	109.10	Yes USER Standard+PB+HWRT - measured Østerild	-2026/08	93.9	8.0	98.5
41344.0120	5.265.178	0.0	0.0 57071500001613547: 8300 Mw. VESTAS	V164-8.300	V164-8.300	8.300	164.0	107.00	Yes USER 107.1-111 estimeret øktavbånd	6.0	94.0	8.0	98.6
42344.0116	5.264.504	0.0	0.0 57071500001613500: 8300 Mw. VESTAS	V164-8.300	V164-8.300	8.300	164.0	107.00	Yes USER 107.1-111 estimeret øktavbånd	6.0	94.0	8.0	98.6
43440.637	5.175.485	6.0	0.5 57071500001613523: 8300 Mw. VESTAS	V164-8.300	V164-8.300	8.300	164.0	107.00	Yes USER 107.1-111 estimeret øktavbånd	6.0	94.0	8.0	98.6
44310.633	5.174.303	0.0	0.5 57071500001613561: 8300 Mw. VESTAS	V164-8.300	V164-8.300	8.300	164.0	107.00	Yes USER 107.1-111 estimeret øktavbånd	6.0	94.0	8.0	98.6
45310.633	5.174.303	0.0	0.5 57071500001613530: 8300 Mw. VESTAS	V164-8.300	V164-8.300	8.300	164.0	10					



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

07/04/2020 07.16/3.3.274

DECIBEL - Main Result**Calculation Vesterhav Syd LF VS measured + VN measured r1**

...continued from previous page

Easting	Northing	Z	Row	Description	WTG type	Valid	Manufact.	Type-generator	Power rated	Rotor diameter	Hub height	Noise data	Offshore	CreatorName	First wind speed [m/s]	LwaRef [dB(A)]	Last wind speed [m/s]	LwaRef [dB(A)]
[m]	[m]	[m]							[kW]	[m]	[m]							
64415.650	ø.176.870,5	5	0	0,570715000001613721: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	8,0	94,0	8,0	98,6
64415.526	ø.175.771,5	5	0	0,570715000001613738: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	8,0	94,0	8,0	98,6
64415.575	ø.172.459,5	5	0	0,570715000001613745: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
67415.959	ø.170.288,5	5	0	0,570715000001613752: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
68416.254	ø.169.217,5	5	0	0,570715000001613769: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
69416.617	ø.168.173,5	5	0	0,570715000001613776: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
70417.045	ø.167.155,5	5	0	0,570715000001613783: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
71417.326	ø.166.633,5	5	0	0,570715000001613790: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
72417.594	ø.178.040,5	5	0	0,570715000001613806: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
73417.400	ø.176.952,5	5	0	0,570715000001613813: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
74417.275	ø.175.853,5	5	0	0,570715000001613820: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
75417.221	ø.174.743,5	5	0	0,570715000001613837: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
76417.238	ø.173.643,5	5	0	0,570715000001613844: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
77417.436	ø.172.140,5	5	0	0,570715000001613851: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
78417.587	ø.170.669,5	5	0	0,570715000001613858: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
79418.526	ø.168.523,5	5	0	0,570715000001613882: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
80418.815	ø.167.175,5	5	0	0,570715000001613882: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
81418.851	ø.174.211,5	5	0	0,570715000001613899: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
82418.867	ø.173.105,5	5	0	0,570715000001613905: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
83419.173	ø.171.545,5	5	0	0,570715000001613912: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
84419.458	ø.170.446,5	5	0	0,570715000001613929: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
85420.175	ø.169.343,5	5	0	0,570715000001613936: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
86420.116	ø.168.336,5	5	0	0,570715000001613943: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
87420.947	ø.171.657,5	5	0	0,570715000001613950: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
88421.207	ø.170.528,5	5	0	0,570715000001613967: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
89421.502	ø.169.463,5	5	0	0,570715000001613974: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
90422.846	ø.171.426,5	5	0	0,570715000001613981: 8300 Mw.,VESTAS	V164	-8.300			8.300	164,0	107,00	Yes	User	107.1-111 estimeret oktavbånd	6,0	94,0	8,0	98,6
91446.458	ø.207.313,5	5	1,8570715000001603978: 850 Mw.,VESTAS	V52-850	850	52,0	49,0		850	52,0	49,0		User	Measured P6.005.17	6,0	81,4	8,0	83,2
92447.367	ø.206.294,5	5	4,3570715000001603980: 3075 Mw.,VESTAS	V112-3,0	MW	50/60 Hz-3.ØØØ	112,0	94,00					User	Measured - Hvide Sande 3	6,0	92,8	8,0	93,8
93447.429	ø.206.206,5	5	4,3570715000001603740: 3075 Mw.,VESTAS	V112-3,0	MW	50/60 Hz-3.ØØØ	112,0	94,00					User	Measured - Hvide Sande 1	6,0	90,9	8,0	92,9
94444.630	ø.206.924,5	5	5,037071500000152757: 3075 Mw.,VESTAS	V112-3,0	MW	50/60 Hz-3.ØØØ	112,0	94,00					User	Measured - Hvide Sande 2	6,0	91,3	8,0	96,0
99443.337	ø.210.774,7	5	3,9571313134808006110: 25 kWes. Sold Wind PowerWP-25-25		25				14,0	18,0			EMD	SWP-25	6,0	72,2	8,0	72,9

Calculation Results**Sound level**

No.	Name	Easting	Northing	Z [m]	Immission height [m]	Wind speed [m/s]	Noise [dB(A)]	From WTGs [dB(A)]	Demands	Sound level [dB(A)]	Demands fulfilled ?
A	Krogen sommerhusområde 1	445.325,0	6.224.648,7	0,0		1,5	6,0	20,0	4,7	Yes	
B	Howig sommerhusområde	444.587,6	6.219.581,1	2,5		1,5	6,0	20,0	10,2	Yes	
C	Tymose sommerhusområde 1	444.465,3	6.216.548,4	5,0		1,5	6,0	20,0	6,2	Yes	
D	Klegod sommerhusområde	444.186,8	6.215.365,0	5,0		1,5	6,0	20,0	6,5	Yes	
E	Holmsland Klit sommerhusområde	443.849,8	6.214.031,9	7,5		1,5	6,0	20,0	8,0	Yes	
F	Nørre Lyngvig sommerhusområde 1	444.633,1	6.212.104,8	2,7		1,5	6,0	20,0	6,6	Yes	
F	Nørre Lyngvig sommerhusområde 2	444.828,4	6.211.338,4	5,3		1,5	6,0	20,0	11,7	Yes	
G	Nørre Lyngvig sommerhus område	444.289,4	6.211.338,4	5,3		1,5	6,0	20,0	6,9	Yes	
H	Hundested sommerhusområde	445.626,5	6.205.673,7	2,5		1,5	6,0	20,0	11,4	Yes	
I	Gammelhus sommerhusområde	446.082,3	6.203.265,9	2,5		1,5	6,0	20,0	14,6	Yes	
J	Årgab sommerhusområde	446.580,1	6.201.126,2	3,8		1,5	6,0	20,0	6,2	Yes	
K	Hvide Sande boligområde	445.326,3	6.207.492,7	5,2		1,5	6,0	20,0	10,8	Yes	
L	Hjørnet af matriklen, Dakotavej 23A	445.325,8	6.207.492,4	12,5		1,5	6,0	20,0	11,6	Yes	
M	Hvide Sande boligområde 2	445.334,8	6.206.260,9	4,4		1,5	6,0	20,0	13,7	Yes	
M	Hvide Sande boligområde 2	445.334,8	6.206.260,9	4,4		8,0	20,0	10,8	Yes		
M	Hvide Sande boligområde 2	445.334,8	6.206.260,9	4,4		8,0	20,0	13,4	Yes		

Distances (m)

WTG	A	B	C	D	E	F	G	H	I	J	K	L	M
1	10500	9855	10813	11272	11560	13343	14148	19372	21654	23721	21739	17705	18722
2	10643	9768	10520	10905	11147	12891	13675	18809	21074	23133	16596	17160	18161
3	10827	9691	10265	10565	10761	12462	13220	18255	20500	22550	16063	16625	17608
4	11051	9661	10051	10260	104								



Project: **Vesterhav (19105)** **Description:** Limitation of Liability
 EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:
EMD International A/S
 Niels Jernes Vej 10
 DK-9220 Aalborg Ø
 +45 9635 4444
 Thomas Sørensen / ts@emd.dk
Calculated:
 07/04/2020 07.16/3.3.274

DECIBEL - Main Result

Calculation Vesterhav Syd LF VS measured + VN measured r1

...continued from previous page

WTG	A	B	C	D	E	F	G	H	I	J	K	L	M
7	11935	9578	9633	9582	9561	11004	11629	16138	18283	20282	14064	14612	15506
8	12293	9584	9584	9445	9363	10719	11300	15639	17752	19734	13605	14147	15012
9	12677	9638	9583	9356	9212	10471	11004	15154	17231	19195	13166	13701	14535
10	13086	9741	9630	9317	9110	10262	10744	14685	16723	18665	12748	13274	14074
11	13517	9889	9725	9329	9035	10096	10522	14235	16227	18146	12354	12871	13632
12	13968	10083	9853	9390	8997	9974	10341	13803	15745	17638	11986	12492	13211
13	14434	10318	9996	9497	9012	9895	10202	13392	15279	17140	11647	12139	12813
14	14918	10593	10183	9646	9078	9830	10103	13005	14831	16654	11340	11816	12439
15	15416	10893	10412	9841	9195	9805	10033	12643	14400	16182	11066	11525	12092
16	15928	11222	10680	10079	9360	9828	10008	12308	13990	15725	10829	11268	11773
17	16450	11582	10984	10356	9572	9898	10028	12004	13603	15286	10631	11047	11486
18	16984	11969	11320	10671	9827	10015	10091	11731	13239	14866	10473	10865	11233
19	17528	12380	11686	11019	10122	10176	10200	11493	12902	14465	10359	10724	11017
20	18082	12816	12080	11398	10454	10381	10354	11291	12592	14087	10290	10626	10841
21	54252	56371	62929	63944	65170	67016	68003	74120	76533	78637	71768	72288	73491
22	53546	55664	62221	63236	64461	66308	67294	73412	75825	77930	71060	71579	72783
23	52840	54957	61512	62528	63752	65599	66586	72704	75118	77222	70352	70871	72075
24	52133	54250	60804	61819	63043	64891	65877	71996	74410	76515	69644	70163	71366
25	51427	53544	60096	61111	62334	64182	65169	71288	73703	75808	68936	69455	70658
26	50721	52837	59387	60403	61625	63474	64461	70580	72995	75100	68228	68747	69950
27	50016	52130	58679	59694	60916	62766	63752	69872	72288	74393	67520	68038	69242
28	49310	51424	57971	58986	60207	62058	63044	69164	71580	73686	66812	67330	68534
29	48605	50717	52623	58278	59499	61349	62336	68456	70873	72979	66104	66622	67826
30	47899	50011	56555	55750	58790	60641	61628	67748	70166	72272	65397	65914	67118
31	47194	49305	55847	56862	58081	59933	60920	67041	69459	71565	64689	65207	66410
32	46489	48599	55139	56154	57372	59225	60212	66333	68752	70858	63981	64499	65703
33	45784	47893	54431	55446	56664	58517	59504	65626	68045	70151	63274	63791	64995
34	45079	47187	53724	54739	55955	57809	58797	64918	67338	69444	62566	63083	64287
35	44375	46481	53016	54031	55247	57101	58089	64211	66631	68738	61850	62376	63580
36	43671	45776	52308	53323	54538	56394	57381	63503	65924	68031	61151	61668	62872
37	42967	45071	51601	52616	53830	55686	56673	62796	65218	67324	60444	60960	62164
38	42263	44366	50893	51908	53121	54978	55966	62089	64511	66618	59737	60253	61457
39	41559	43661	50186	51201	52413	54271	55258	61382	63804	65911	59030	59546	60750
40	40856	42956	49479	50494	51705	53563	54551	60675	63098	65205	58323	58838	60042
41	40152	42251	48772	49786	50997	52856	53844	59968	62392	64498	57616	58131	59335
42	58517	53109	52231	51502	53060	49567	49180	45177	44385	44192	47014	47013	45947
43	59329	53869	52979	52248	51093	50269	49869	45725	44890	44682	47639	46542	
44	59841	54320	53415	52682	51514	50652	50238	45939	45059	44835	47939	47938	46809
45	60462	54885	53966	53230	52050	51153	50724	46275	45351	45110	48358	48357	47196
46	61243	55622	54692	53956	52765	51840	51400	46829	45867	45612	48980	48979	47791
47	62100	56440	55501	54763	53564	52614	52164	47481	46485	46217	49694	49694	48482
48	57463	51985	51091	50360	49202	48372	47970	43832	43007	42803	45739	45738	44644
49	56375	50812	49899	49165	47990	47113	46693	42385	41516	41297	44381	44380	43249
50	57372	51779	50858	50123	48941	48043	47614	43205	42304	42073	45259	45258	44106
51	58342	52717	51787	51051	49861	48941	48503	43991	43056	42812	46103	46102	44927
52	59280	53622	52684	51946	50749	49805	49358	44739	43771	43514	46911	46911	45713
53	60187	54493	53546	52807	51602	50634	50178	45450	44448	44178	47684	47683	46462
54	61059	55329	54373	53633	52420	51427	50961	46123	45086	44804	48419	48418	47174
55	61893	56127	55161	54421	53199	52818	51705	46756	45682	45389	49114	49113	47846
56	55299	49655	48723	47986	46794	45871	45433	40956	40043	39810	43040	43040	41873
57	56307	50635	49696	48958	47759	46815	46370	41793	40849	40602	43935	43934	42746
58	58242	52509	51553	50813	49601	48612	48149	43366	42355	42083	45625	44393	
59	59163	53397	52433	51693	50473	49460	48988	44098	43052	42768	46418	46417	45163
60	60902	55067	54085	53344	52109	51047	50555	45447	44328	44022	47890	47890	46589
61	61716	55846	54855	54113	52871	51783	51281	46063	44907	44590	48560	48568	47244
62	62490	56585	55585	54843	53593	52479	51967	46638	45444	45117	49206	49205	47858
63	54257	48533	47582	46842	45634	44662	44207	39551	38593	38343	41730	41729	40525
64	55276	49527	48569	47829	46615	45623	45159	40408	39418	39156	42642	42642	41417
65	56271	50494	49528	48788	47567	46554	46082	41232	40209	39934	43523	43522	42277
66	59077	53209	52219	51477	50235	49154	48655	43492	42361	42053	45961	45961	44649
67	60777	54843	53836	53094	51838	50707	50189	44810	43606	43277	47402	47401	46044
68	61571	55604	54588	53846	52583	51426	50898	45411	44170	43830	48064	48063	46684
69	62323	56323	55298	54556	53287	52104	51566	45970	44692	44342	48685	48684	47282
70	63035	57002	55969	55227	53951	52742	52194	46489	45175	44814	49265	49265	47841
71	63703	57637	56595	55854	54571	53336	52778	46965	45615	45244	49802	49802	48356
72	53252	47450	46479	45738	44513	43491	43017	38177	37170	36903	40453	40453	39210

To be continued on next page...



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

07/04/2020 07.16/3.3.274

DECIBEL - Main Result**Calculation** Vesterhav Syd LF VS measured + VN measured r1

...continued from previous page

WTG	A	B	C	D	E	F	G	H	I	J	K	L	M
73	54283	48457	47479	46738	45508	44467	43985	39052	38014	37734	41383	41382	40120
74	55290	49439	48455	47713	46477	45416	44926	39897	38824	38533	42283	42283	41000
75	56270	50391	49400	48658	47416	46334	45835	40707	39599	39298	43151	43150	41846
76	57221	51314	50316	49573	48325	47220	46713	41483	40339	40027	43985	43984	42659
77	59317	53347	52331	51588	50326	49170	48643	43186	41962	41627	45818	45818	44445
78	60182	54171	53145	52403	51132	49945	49406	43816	42547	42199	46523	46523	45123
79	61226	55174	54137	53395	52116	50895	50343	44610	43292	42930	47399	47398	45969
80	62237	56147	55099	54359	53072	51819	51254	45387	44023	43649	48252	48252	46795
81	55942	49984	48973	48230	46972	45832	45312	39961	38783	38463	42527	42526	41176
82	56910	50927	49909	49166	47902	46742	46214	40767	39555	39225	43388	43388	42017
83	58155	52129	51099	50357	49084	47888	47346	41744	40478	40132	44454	44454	43051
84	59012	52955	51917	51175	49895	48674	48122	42411	41106	40749	45184	45183	43758
85	59842	53757	52711	51970	50685	49440	48879	43064	41724	41356	45896	45895	44449
86	60636	54522	53468	52728	51437	50167	49597	43680	42304	41926	46570	46570	45103
87	57274	51187	50141	49400	48115	46872	46313	40535	39216	38855	43341	43341	41903
88	58188	52073	51020	50280	48989	47722	47153	41270	39913	39541	44137	44136	42677
89	59037	52897	51836	51097	49801	48511	47933	41952	40559	40178	44875	44875	43395
90	56700	50545	49481	48743	47445	46145	45565	39573	38186	37806	42498	42498	41016
91	16125	9666	8538	7651	6458	4724	4242	1786	3991	6083	852	1146	1419
92	16154	9689	8486	7590	6426	4591	4052	1936	4304	6428	784	784	1287
93	16865	10400	9196	8298	7127	5292	4765	1284	3581	5702	1105	1104	696
94	16509	10044	8840	7943	6775	4940	4408	1601	3942	6064	885	884	968
95	12644	6172	4988	4087	2899	1093	607	5105	7538	9643	2754	3282	4481



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

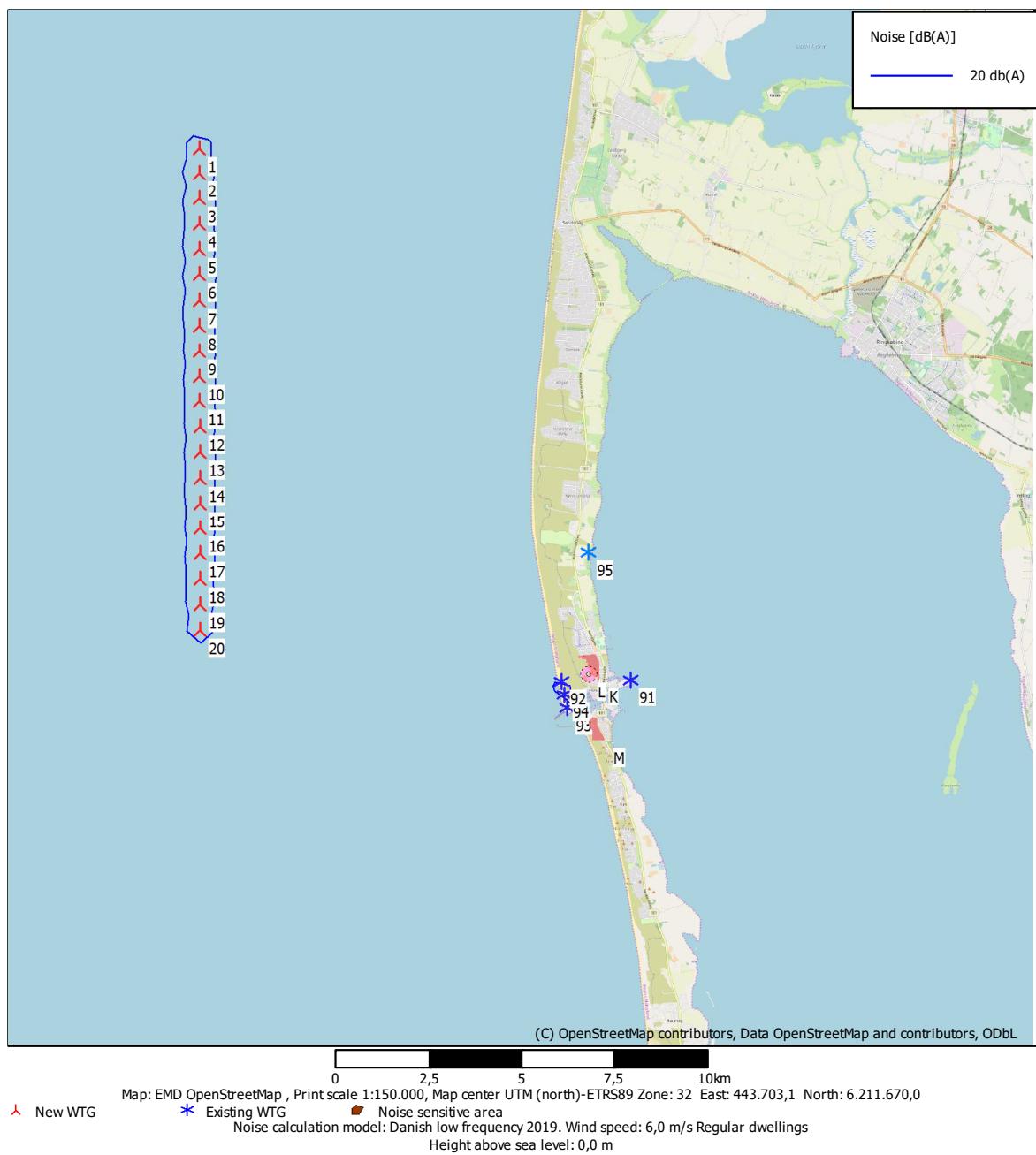
DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

07/04/2020 07.16/3.3.274

DECIBEL - Map 6,0 m/s Regular dwellings**Calculation** Vesterhav Syd LF VS measured + VN measured r1



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

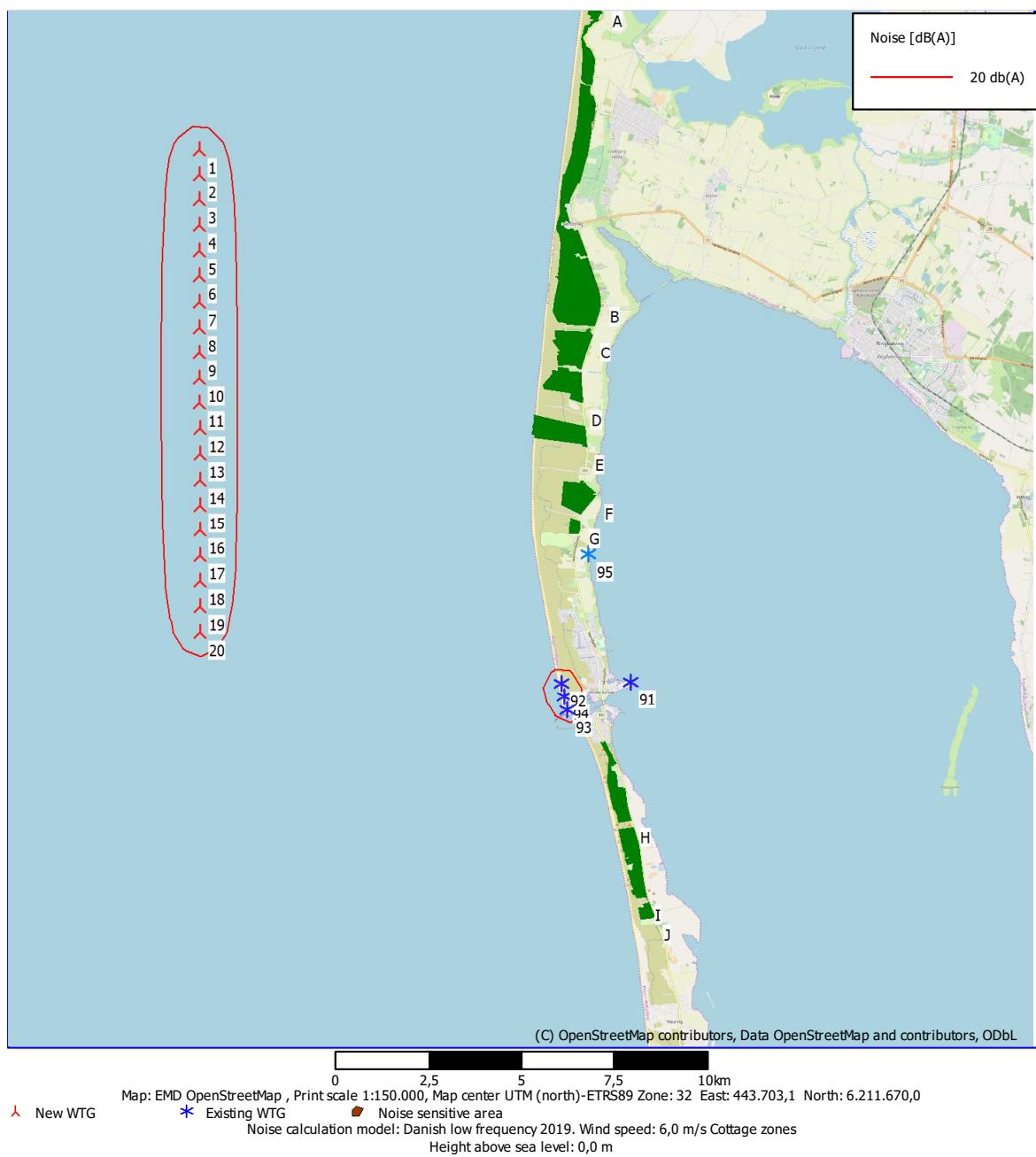
Thomas Sørensen / ts@emd.dk

Calculated:

07/04/2020 07.16/3.3.274

DECIBEL - Map 6,0 m/s Cottage zones

Calculation Vesterhav Syd LF VS measured + VN measured r1





Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

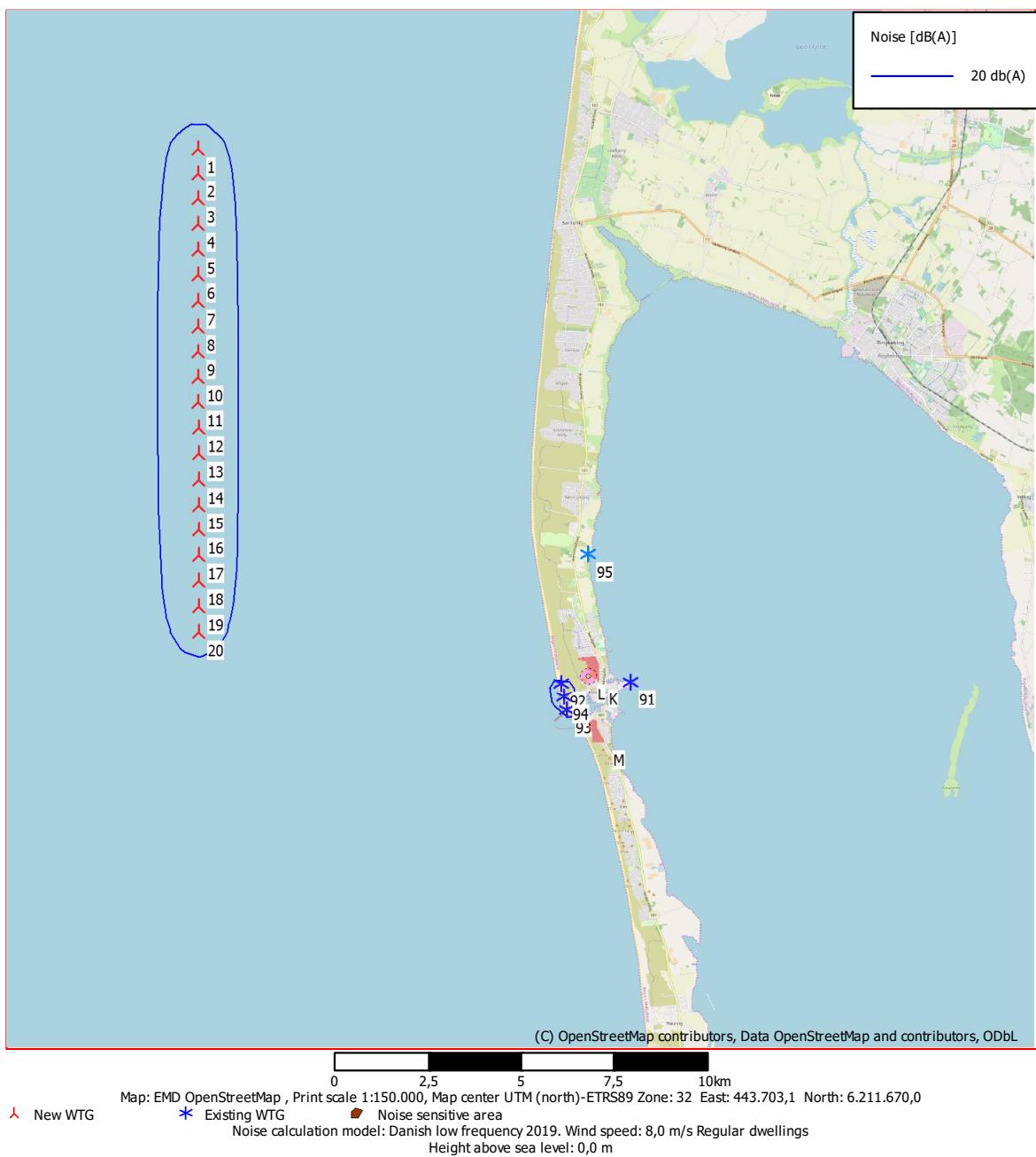
DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

07/04/2020 07.16/3.3.274

DECIBEL - Map 8,0 m/s Regular dwellings**Calculation** Vesterhav Syd LF VS measured + VN measured r1



Project:

Vesterhav (19105)

Description:

Limitation of Liability

EMD International A/S does not warrant, guarantee or make any representations regarding the delivered consultancy material caused by errors or omissions in the delivered data. EMD cannot be held liable for erroneous results caused by inaccuracy, limitations or malfunctioning of models or software used. For any claim whatsoever related to the subject matter of this consultancy service, the liability of EMD International A/S for actual damages, regardless of the form of action, shall be limited to the total amount paid to EMD International for the services provided as part of this consultancy service. Separate insurance cover for extended liability can be provided upon request, but at the expense of the Client.

Licensed user:

EMD International A/S

Niels Jernes Vej 10

DK-9220 Aalborg Ø

+45 9635 4444

Thomas Sørensen / ts@emd.dk

Calculated:

07/04/2020 07.16/3.3.274

DECIBEL - Map 8,0 m/s Cottage zones

Calculation Vesterhav Syd LF VS measured + VN measured r1

