

Bilaga 3A - Ljud

Layout C

15 st Gamesa G128, 4,5 MW

Totalhöjd 150 meter

Project:

Grönhult

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VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

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Calculated:

2014-05-28 08:10/2.9.269

DECIBEL - Main Result

Calculation: 140430 G128 15vkv 86HH

SVENSKA BESTÄMMELSER FÖR EXTERNT BULLER FRÅN
LANDBASERADE VINDKRAFTVERK

Beräkningen är baserad på den av Statens Naturvårdsverk
rekommenderad metod "Ljud från vindkraftverk", 2010 (NV dnr
382-6897-07 Rv)

WTGs

Swedish RT90 2.5gonV 0:-15-RT90 (SE)			WTG type			Noise data			Wind speed [m/s]	Status	LwA_ref [dB(A)]	Pure tones				
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]					Hub height [m]	Creator	Name	
C1	1,358,626	6,365,579	276.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 4 - Estimated - 101,6 dB - 05-2012	8.0	From other hub height	101.6	No h
C10	1,360,833	6,365,055	266.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 2 - Estimated - 104,5 dB - 05-2012	8.0	From other hub height	104.5	No h
C11	1,361,229	6,365,669	270.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 2 - Estimated - 104,5 dB - 05-2012	8.0	From other hub height	104.5	No h
C12	1,361,589	6,365,428	271.8	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 3 - Estimated - 102,5 dB - 05-2012	8.0	From other hub height	102.5	No h
C13	1,361,236	6,364,725	275.5	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 2 - Estimated - 104,5 dB - 05-2012	8.0	From other hub height	104.5	No h
C14	1,361,816	6,364,976	273.7	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 3 - Estimated - 102,5 dB - 05-2012	8.0	From other hub height	102.5	No h
C15	1,361,800	6,364,495	278.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 3 - Estimated - 102,5 dB - 05-2012	8.0	From other hub height	102.5	No h
C2	1,358,408	6,365,039	291.8	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 2 - Estimated - 104,5 dB - 05-2012	8.0	From other hub height	104.5	No h
C3	1,357,802	6,364,355	296.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 2 - Estimated - 104,5 dB - 05-2012	8.0	From other hub height	104.5	No h
C4	1,357,883	6,363,918	268.6	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 3 - Estimated - 102,5 dB - 05-2012	8.0	From other hub height	102.5	No h
C5	1,358,421	6,364,301	276.6	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 2 - Estimated - 104,5 dB - 05-2012	8.0	From other hub height	104.5	No h
C6	1,359,250	6,364,150	278.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 3 - Estimated - 102,5 dB - 05-2012	8.0	From other hub height	102.5	No h
C7	1,360,032	6,365,556	270.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 3 - Estimated - 102,5 dB - 05-2012	8.0	From other hub height	102.5	No h
C8	1,360,615	6,366,035	270.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 3 - Estimated - 102,5 dB - 05-2012	8.0	From other hub height	102.5	No h
C9	1,360,322	6,364,650	270.5	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	86.0	EMD	Level 2 - Estimated - 104,5 dB - 05-2012	8.0	From other hub height	104.5	No h

h) Generic octave distribution used

Calculation Results

Sound Level

Noise sensitive area			Swedish RT90 2.5gonV 0:-15-RT90 (SE)			Demands		Sound Level		Demands fulfilled ?	
No.	Name	East	North	Z	Imission height [m]	Noise [dB(A)]	From WTGs [dB(A)]	Noise [dB(A)]			
15	15	1,359,229	6,363,485	249.2	1.5	40.0	38.4		Yes		
17	17	1,355,329	6,364,845	246.6	1.5	40.0	27.8		Yes		
36	36	1,362,376	6,365,370	289.1	1.5	40.0	39.4		Yes		
37	37	1,362,741	6,365,134	285.3	1.5	40.0	36.5		Yes		
38	38	1,358,933	6,363,420	248.3	1.5	40.0	38.0		Yes		
A	1	1,354,438	6,365,935	231.9	1.5	40.0	24.3		Yes		
AA	32	1,359,427	6,365,846	262.2	1.5	40.0	39.3		Yes		
AB	33	1,353,753	6,365,140	228.1	1.5	40.0	23.0		Yes		
AC	35	1,362,402	6,364,358	271.0	1.5	40.0	39.0		Yes		
B	2	1,354,302	6,365,863	228.0	1.5	40.0	24.0		Yes		
C	3	1,355,719	6,366,777	230.0	1.5	40.0	26.6		Yes		
D	4	1,355,823	6,366,785	228.0	1.5	40.0	26.9		Yes		
E	5	1,356,247	6,366,773	220.8	1.5	40.0	28.0		Yes		
F	6	1,356,082	6,365,087	238.0	1.5	40.0	30.7		Yes		
G	7	1,356,579	6,366,515	237.5	1.5	40.0	29.6		Yes		
H	8	1,356,602	6,365,151	223.5	1.5	40.0	33.1		Yes		
I	9	1,355,989	6,364,921	223.8	1.5	40.0	30.5		Yes		
J	10	1,355,455	6,364,908	260.8	1.5	40.0	28.3		Yes		
K	11	1,356,610	6,364,688	204.8	1.5	40.0	34.0		Yes		
L	12	1,357,660	6,365,318	239.4	1.5	40.0	38.5		Yes		
M	13	1,358,185	6,366,173	238.8	1.5	40.0	36.7		Yes		
N	14	1,359,151	6,365,788	250.8	1.5	40.0	39.7		Yes		
O	18	1,358,766	6,363,487	243.7	1.5	40.0	38.5		Yes		
P	19	1,358,000	6,363,182	217.0	1.5	40.0	37.3		Yes		
Q	20	1,357,380	6,363,227	204.0	1.5	40.0	35.8		Yes		
R	21	1,357,225	6,363,317	206.3	1.5	40.0	35.6		Yes		
S	23	1,360,701	6,363,647	259.7	1.5	40.0	37.4		Yes		
T	24	1,361,391	6,363,807	280.0	1.5	40.0	38.5		Yes		
U	26	1,362,356	6,365,303	284.8	1.5	40.0	39.8		Yes		
V	27	1,362,521	6,365,953	278.0	1.5	40.0	36.1		Yes		
W	28	1,361,906	6,366,738	260.8	1.5	40.0	35.1		Yes		
X	29	1,360,812	6,366,711	272.4	1.5	40.0	38.0		Yes		
Y	30	1,360,247	6,366,836	262.8	1.5	40.0	36.2		Yes		
Z	31	1,359,762	6,366,416	259.0	1.5	40.0	37.2		Yes		

Project:

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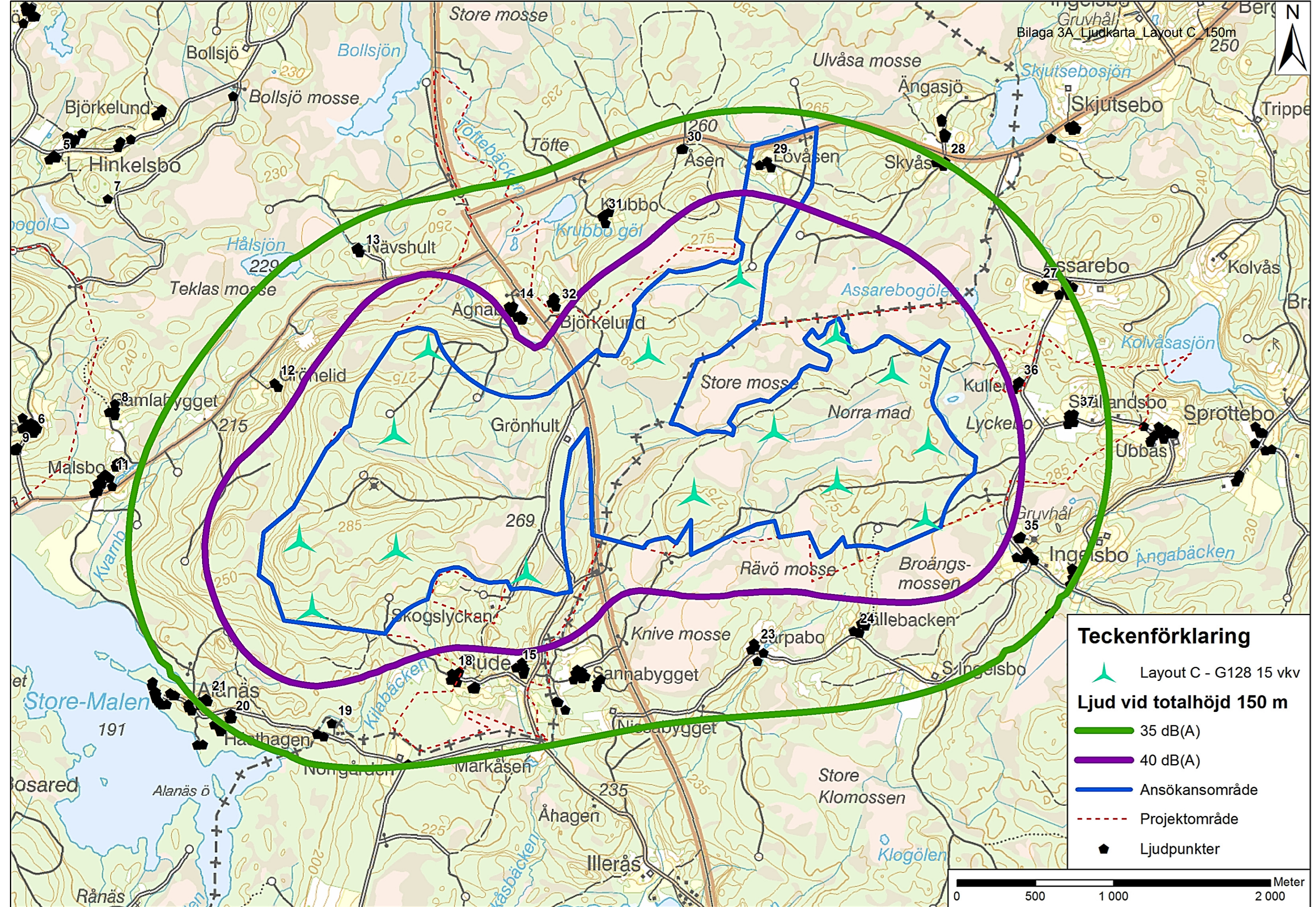
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DECIBEL - Main Result

Calculation: 140430 G128 15vkv 86HH

Distances (m)**WTG**

NSA	C4	C5	C13	C9	C11	C10	C3	C8	C1	C2	C7	C15	C12	C14	C6
15	1413	1148	2358	1597	2960	2243	1670	2901	2178	1756	2220	2761	3055	2984	665
17	2716	3138	5905	4995	5955	5506	2520	5416	3377	3084	4754	6477	6284	6485	3980
36	4719	4095	1310	2176	1185	1574	4683	1881	3754	3980	2351	1047	789	685	3354
37	5005	4397	1559	2465	1603	1908	4997	2307	4136	4331	2740	1137	1188	938	3625
38	1162	1019	2645	1854	3212	2505	1467	3108	2180	1701	2401	3060	3328	3274	795
A	3990	4302	6900	6019	6792	6451	3714	6174	4201	4068	5603	7497	7165	7436	5129
AA	2468	1842	2127	1493	1810	1613	2204	1203	844	1299	671	2729	2201	2541	1704
AB	4304	4740	7490	6583	7490	7076	4121	6916	4890	4653	6289	8068	7837	8060	5582
AC	4537	3979	1222	2099	1758	1715	4598	2449	3966	4049	2654	617	1343	851	3157
B	4073	4402	7022	6137	6926	6577	3808	6312	4331	4186	5735	7617	7296	7562	5233
C	3584	3663	5883	5068	5618	5394	3193	4950	3143	3201	4480	6492	6020	6354	4399
D	3529	3592	5789	4977	5518	5298	3132	4849	3050	3119	4383	6398	5921	6257	4321
E	3289	3290	5390	4593	5101	4895	2873	4428	2661	2770	3974	5999	5506	5849	3985
F	2146	2466	5164	4260	5177	4749	1868	4629	2590	2326	3976	5745	5515	5732	3302
G	2904	2878	4987	4180	4724	4496	2481	4063	2250	2350	3582	5595	5124	5456	3566
H	1777	2006	4651	3752	4653	4230	1439	4107	2068	1809	3452	5236	4992	5214	2829
I	2142	2509	5248	4339	5291	4844	1898	4756	2717	2421	4091	5824	5620	5825	3349
J	2620	3025	5780	4871	5821	5377	2409	5279	3240	2954	4620	6355	6152	6358	3868
K	1486	1850	4623	3710	4719	4236	1236	4223	2203	1831	3528	5190	5031	5211	2692
L	1416	1269	3622	2742	3584	3182	972	3039	1000	798	2382	4218	3928	4167	1971
M	2273	1885	3375	2622	3083	2872	1857	2433	739	1155	1946	3983	3482	3821	2284
N	2257	1655	2339	1632	2081	1834	1967	1485	564	1054	911	2946	2463	2785	1640
O	981	883	2761	1942	3289	2593	1296	3147	2095	1591	2424	3196	3424	3392	820
P	745	1195	3582	2745	4073	3394	1189	3868	2476	1899	3123	4018	4231	4214	1580
Q	854	1495	4134	3266	4555	3904	1203	4281	2660	2081	3527	4595	4747	4765	2084
R	891	1548	4248	3370	4641	4002	1186	4342	2659	2087	3588	4721	4845	4878	2188
S	2829	2370	1202	1071	2088	1413	2982	2388	2833	2680	2021	1387	1989	1734	1534
T	3507	3009	930	1360	1868	1366	3629	2357	3282	3225	2213	800	1632	1243	2167
U	4679	4058	1260	2135	1184	1542	4649	1887	3738	3954	2336	980	777	631	3311
V	5061	4418	1776	2554	1322	1911	4980	1906	3910	4211	2519	1625	1069	1204	3733
W	4909	4250	2120	2619	1264	1995	4743	1469	3476	3886	2214	2244	1347	1763	3706
X	4045	3393	2030	2117	1122	1656	3821	704	2460	2927	1393	2425	1499	2003	2998
Y	3753	3122	2330	2186	1524	1874	3482	881	2050	2570	1297	2808	1944	2432	2864
Z	3124	2503	2242	1851	1645	1731	2843	934	1410	1930	901	2799	2076	2507	2322



Bilaga 3A - Ljud

Layout C

15 st Gamesa G128, 4,5 MW

Totalhöjd 200 meter

Project:

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VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Jenny Longworth / jenny.longworth@vattenfall.com

Calculated:

2014-05-28 07:39/2.9.269

DECIBEL - Main Result

Calculation: 140430 G128 15kv 136HH Noise

SVENSKA BESTÄMMELSER FÖR EXTERNT BULLER FRÅN
LANDBASERADE VINDKRAFTVERK

Beräkningen är baserad på den av Statens Naturvårdsverk
rekommenderad metod "Ljud från vindkraftverk", 2010 (NV dnr
382-6897-07 Rv)

WTGs

Swedish RT90 2.5gonV 0:-15-RT90 (SE)			WTG type			Noise data			Wind speed [m/s]	Status	LwA_ref [dB(A)]	Pure tones				
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]					Hub height [m]	Creator	Name	
C1	1,358,626	6,365,579	276.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 3 - Estimated - 102.5 dB - 05-2012	8.0	From other hub height	102.5	No h
C10	1,360,833	6,365,055	266.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 2 - Estimated - 104.5 dB - 05-2012	8.0	From other hub height	104.5	No h
C11	1,361,229	6,365,669	270.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 2 - Estimated - 104.5 dB - 05-2012	8.0	From other hub height	104.5	No h
C12	1,361,589	6,365,428	271.8	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 3 - Estimated - 102.5 dB - 05-2012	8.0	From other hub height	102.5	No h
C13	1,361,236	6,364,725	275.5	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 2 - Estimated - 104.5 dB - 05-2012	8.0	From other hub height	104.5	No h
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C2	1,358,408	6,365,039	291.8	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 2 - Estimated - 104.5 dB - 05-2012	8.0	From other hub height	104.5	No h
C3	1,357,802	6,364,355	296.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 2 - Estimated - 104.5 dB - 05-2012	8.0	From other hub height	104.5	No h
C4	1,357,883	6,363,918	268.6	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 3 - Estimated - 102.5 dB - 05-2012	8.0	From other hub height	102.5	No h
C5	1,358,421	6,364,301	276.6	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 2 - Estimated - 104.5 dB - 05-2012	8.0	From other hub height	104.5	No h
C6	1,359,250	6,364,150	278.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 3 - Estimated - 102.5 dB - 05-2012	8.0	From other hub height	102.5	No h
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C8	1,360,615	6,366,035	270.0	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 3 - Estimated - 102.5 dB - 05-2012	8.0	From other hub height	102.5	No h
C9	1,360,322	6,364,650	270.5	GAMESA G128 4500 128.0 IOI h...	Yes	GAMESA	G128-4,500	4,500	128.0	136.0	EMD	Level 2 - Estimated - 104.5 dB - 05-2012	8.0	From other hub height	104.5	No h

h) Generic octave distribution used

Calculation Results

Sound Level

Noise sensitive area			Swedish RT90 2.5gonV 0:-15-RT90 (SE)			Demands		Sound Level		Demands fulfilled ?	
No.	Name	East	North	Z	Imission height [m]	Noise [dB(A)]	From WTGs [dB(A)]	Noise [dB(A)]			
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17	17	1,355,329	6,364,845	246.6	1.5	40.0	27.9	Yes			
36	36	1,362,376	6,365,370	289.1	1.5	40.0	39.3	Yes			
37	37	1,362,741	6,365,134	285.3	1.5	40.0	36.5	Yes			
38	38	1,358,933	6,363,420	248.3	1.5	40.0	37.9	Yes			
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AA	32	1,359,427	6,365,846	262.2	1.5	40.0	39.4	Yes			
AB	33	1,353,753	6,365,140	228.1	1.5	40.0	23.1	Yes			
AC	35	1,362,402	6,364,358	271.0	1.5	40.0	38.9	Yes			
B	2	1,354,302	6,365,863	228.0	1.5	40.0	24.1	Yes			
C	3	1,355,719	6,366,777	230.0	1.5	40.0	26.7	Yes			
D	4	1,355,823	6,366,785	228.0	1.5	40.0	27.0	Yes			
E	5	1,356,247	6,366,773	220.8	1.5	40.0	28.1	Yes			
F	6	1,356,082	6,365,087	238.0	1.5	40.0	30.8	Yes			
G	7	1,356,579	6,366,515	237.5	1.5	40.0	29.7	Yes			
H	8	1,356,602	6,365,151	223.5	1.5	40.0	33.2	Yes			
I	9	1,355,989	6,364,921	223.8	1.5	40.0	30.5	Yes			
J	10	1,355,455	6,364,908	260.8	1.5	40.0	28.3	Yes			
K	11	1,356,610	6,364,688	204.8	1.5	40.0	34.0	Yes			
L	12	1,357,660	6,365,318	239.4	1.5	40.0	38.6	Yes			
M	13	1,358,185	6,366,173	238.8	1.5	40.0	36.9	Yes			
N	14	1,359,151	6,365,788	250.8	1.5	40.0	40.0	Yes			
O	18	1,358,766	6,363,487	243.7	1.5	40.0	38.4	Yes			
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Q	20	1,357,380	6,363,227	204.0	1.5	40.0	35.8	Yes			
R	21	1,357,225	6,363,317	206.3	1.5	40.0	35.5	Yes			
S	23	1,360,701	6,363,647	259.7	1.5	40.0	37.4	Yes			
T	24	1,361,391	6,363,807	280.0	1.5	40.0	38.4	Yes			
U	26	1,362,356	6,365,303	284.8	1.5	40.0	39.7	Yes			
V	27	1,362,521	6,365,953	278.0	1.5	40.0	36.1	Yes			
W	28	1,361,906	6,366,738	260.8	1.5	40.0	35.1	Yes			
X	29	1,360,812	6,366,711	272.4	1.5	40.0	37.9	Yes			
Y	30	1,360,247	6,366,836	262.8	1.5	40.0	36.2	Yes			
Z	31	1,359,762	6,366,416	259.0	1.5	40.0	37.2	Yes			

Project:

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VATTENFALL AB IT

Företagsenhet 1002

SE-962 80 Jokkmokk

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Calculated:

2014-05-28 07:39/2.9.269

DECIBEL - Main Result

Calculation: 140430 G128 15vkv 136HH Noise

Distances (m)**WTG**

NSA	C4	C5	C13	C9	C11	C10	C3	C8	C1	C2	C7	C15	C12	C14	C6
15	1413	1148	2358	1597	2960	2243	1670	2901	2178	1756	2220	2761	3055	2984	665
17	2716	3138	5905	4995	5955	5506	2520	5416	3377	3084	4754	6477	6284	6485	3980
36	4719	4095	1310	2176	1185	1574	4683	1881	3754	3980	2351	1047	789	685	3354
37	5005	4397	1559	2465	1603	1908	4997	2307	4136	4331	2740	1137	1188	938	3625
38	1162	1019	2645	1854	3212	2505	1467	3108	2180	1701	2401	3060	3328	3274	795
A	3990	4302	6900	6019	6792	6451	3714	6174	4201	4068	5603	7497	7165	7436	5129
AA	2468	1842	2127	1493	1810	1613	2204	1203	844	1299	671	2729	2201	2541	1704
AB	4304	4740	7490	6583	7490	7076	4121	6916	4890	4653	6289	8068	7837	8060	5582
AC	4537	3979	1222	2099	1758	1715	4598	2449	3966	4049	2654	617	1343	851	3157
B	4073	4402	7022	6137	6926	6577	3808	6312	4331	4186	5735	7617	7296	7562	5233
C	3584	3663	5883	5068	5618	5394	3193	4950	3143	3201	4480	6492	6020	6354	4399
D	3529	3592	5789	4977	5518	5298	3132	4849	3050	3119	4383	6398	5921	6257	4321
E	3289	3290	5390	4593	5101	4895	2873	4428	2661	2770	3974	5999	5506	5849	3985
F	2146	2466	5164	4260	5177	4749	1868	4629	2590	2326	3976	5745	5515	5732	3302
G	2904	2878	4987	4180	4724	4496	2481	4063	2250	2350	3582	5595	5124	5456	3566
H	1777	2006	4651	3752	4653	4230	1439	4107	2068	1809	3452	5236	4992	5214	2829
I	2142	2509	5248	4339	5291	4844	1898	4756	2717	2421	4091	5824	5620	5825	3349
J	2620	3025	5780	4871	5821	5377	2409	5279	3240	2954	4620	6355	6152	6358	3868
K	1486	1850	4623	3710	4719	4236	1236	4223	2203	1831	3528	5190	5031	5211	2692
L	1416	1269	3622	2742	3584	3182	972	3039	1000	798	2382	4218	3928	4167	1971
M	2273	1885	3375	2622	3083	2872	1857	2433	739	1155	1946	3983	3482	3821	2284
N	2257	1655	2339	1632	2081	1834	1967	1485	564	1054	911	2946	2463	2785	1640
O	981	883	2761	1942	3289	2593	1296	3147	2095	1591	2424	3196	3424	3392	820
P	745	1195	3582	2745	4073	3394	1189	3868	2476	1899	3123	4018	4231	4214	1580
Q	854	1495	4134	3266	4555	3904	1203	4281	2660	2081	3527	4595	4747	4765	2084
R	891	1548	4248	3370	4641	4002	1186	4342	2659	2087	3588	4721	4845	4878	2188
S	2829	2370	1202	1071	2088	1413	2982	2388	2833	2680	2021	1387	1989	1734	1534
T	3507	3009	930	1360	1868	1366	3629	2357	3282	3225	2213	800	1632	1243	2167
U	4679	4058	1260	2135	1184	1542	4649	1887	3738	3954	2336	980	777	631	3311
V	5061	4418	1776	2554	1322	1911	4980	1906	3910	4211	2519	1625	1069	1204	3733
W	4909	4250	2120	2619	1264	1995	4743	1469	3476	3886	2214	2244	1347	1763	3706
X	4045	3393	2030	2117	1122	1656	3821	704	2460	2927	1393	2425	1499	2003	2998
Y	3753	3122	2330	2186	1524	1874	3482	881	2050	2570	1297	2808	1944	2432	2864
Z	3124	2503	2242	1851	1645	1731	2843	934	1410	1930	901	2799	2076	2507	2322

