

Project: Windpark Mutkalampi	Description: PROKON Wind Energy Finland Oy VE2 Kalajoki-Kannus-Kokkola	Printed/Page: 20.9.2013 15:53 / 1
		Licensed user: PROKON Regenerative Energien GmbH Kirchhoffstraße 3 DE-25524 Itzehoe +49 4821 6855 100 Michael Sandberg / m.sandberg@prokon.net
		Calculated: 20.9.2013 15:52/2.9.250

DECIBEL - Assumptions for noise calculation

Calculation: 102 x P3000 3MW rd116,5 hh141,6

Noise calculation model:

ISO 9613-2 General

Wind speed:

10,0 m/s

Ground attenuation:

General, Ground factor: 0,5

Meteorological coefficient, C0:

0,0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

Pure and Impulse tone penalty are added to WTG source noise

Height above ground level, when no value in NSA object:

1,5 m Don't allow override of model height with height from NSA object

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0,0 dB(A)

Octave data required

Air absorption

63	125	250	500	1 000	2 000	4 000	8 000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

WTG: PROKON_F+E 3.0MW-116 3030 116.5 !O!

Noise: Mode 2 - 102,5 dB(A) (Herstellerprognose)

Source	Source/Date	Creator	Edited
	21.2.2012	USER	25.10.2012 15:33

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data									
				63	125	250	500	1000	2000	4000	8000		
				[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	10,0	102,5	No	Generic data	84,1	91,1	94,5	97,1	96,9	94,0	89,2	79,7	

WTG: PROKON_F+E 3.0MW-116 3030 116.5 !O!

Noise: Mode 0 - 106,5 dB(A) (Herstellerprognose)

Source	Source/Date	Creator	Edited
	2.2.2012	USER	28.8.2012 16:14

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data								
				63	125	250	500	1000	2000	4000	8000	
				[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	10,0	106,5	No	Generic data	88,1	95,1	98,5	101,1	100,9	98,0	93,2	83,7

NSA: asuinrakennus 01-A

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 40,0 dB(A)

Distance demand:

NSA: asuinrakennus 02-B

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 40,0 dB(A)

Distance demand:

NSA: asuinrakennus 03-C

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

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Calculated:

20.9.2013 15:52/2.9.250

DECIBEL - Assumptions for noise calculation**Calculation:** 102 x P3000 3MW rd116,5 hh141,6**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 04-D**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 05-E**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 06-F**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 07-G**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 08-H**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 09-I**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 10-J**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 11-K**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 12-L**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

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Calculated:
20.9.2013 15:52/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 102 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 13-M**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 14-N**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 15-O**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 16-P**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 17-Q**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 18-R**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 19-S**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 20-T**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 21-U**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

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20.9.2013 15:52/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 102 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 22-V**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 23-W**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 24-X**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 25-Y**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 26-Z**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 27-AA**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 28-AB**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 29-AC**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 30-AD**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

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20.9.2013 15:52/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 102 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 40-AN**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 41-AO**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 42-AP**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 43-AQ**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 44-AR**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 45-AS**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 46-AT**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 47-AU**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 48-AV**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

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20.9.2013 15:52/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 102 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 49-AW**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** Iomarakennus 50-AX**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 51-AY**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 52-AZ**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 53-BA**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 54-BB**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 55-BC**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 56-BD**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 57-BE**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:**

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Calculated:

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DECIBEL - Assumptions for noise calculation

Calculation: 102 x P3000 3MW rd116,5 hh141,6

NSA: Iomarakennus 58-BF

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

NSA: Iomarakennus 59-BG

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

NSA: Iomarakennus 60-BH

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

Project: Windpark Mutkalampi

Description: PROKON Wind Energy Finland Oy VE2 Kalajoki-Kannus-Kokkola

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DECIBEL - Main Result

Calculation: 102 x P3000 3MW rd116,5 hh141,6

Noise calculation model:

ISO 9613-2 General

Wind speed:

10,0 m/s

Ground attenuation:

General, Ground factor: 0,5

Meteorological coefficient, C0:

0,0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

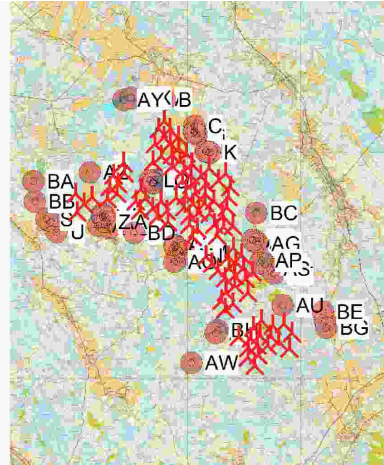
Pure and Impulse tone penalty are added to WTG source noise

Height above ground level, when no value in NSA object:

1,5 m Don't allow override of model height with height from NSA object

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0,0 dB(A)



Scale 1:400 000

New WTG

Noise sensitive area

WTGs

Table with columns: ETRS 89 Zone: 35 (East, North, Z), Row data/Description, WTG type (Valid, Manufact., Type-generator), Power, Rotor diameter, Hub height, Noise data (Creator, Name), Wind speed, Lwa,ref, Pure tones. Contains 53 rows of turbine data.

To be continued on next page...

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Windpark Mutkalampi

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Calculated:

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DECIBEL - Main Result

Calculation: 102 x P3000 3MW rd116,5 hh141,6

...continued from previous page

Noise sensitive area		ETRS 89 Zone: 35			Demands		Sound Level		Demands fulfilled ?
No.	Name	East	North	Z	Imission height	Noise	From WTGs	Noise	
				[m]	[m]	[dB(A)]	[dB(A)]		
	R asuinrakennus	18	354 188,46	7 108 368,49	50,0	1,5	40,0	39,9	Yes
	S asuinrakennus	19	348 515,16	7 106 465,43	40,0	1,5	40,0	29,9	Yes
	T asuinrakennus	20	348 753,02	7 106 285,28	40,0	1,5	40,0	30,8	Yes
	U asuinrakennus	21	349 058,56	7 105 779,09	40,0	1,5	40,0	30,6	Yes
	V asuinrakennus	22	351 499,04	7 106 771,88	50,0	1,5	40,0	37,1	Yes
	W asuinrakennus	23	351 495,69	7 106 655,08	50,0	1,5	40,0	36,5	Yes
	X asuinrakennus	24	351 604,44	7 106 650,77	50,0	1,5	40,0	36,4	Yes
	Y asuinrakennus	25	351 509,10	7 106 585,97	50,0	1,5	40,0	36,1	Yes
	Z asuinrakennus	26	351 619,86	7 106 302,03	47,6	1,5	40,0	34,8	Yes
	AA asuinrakennus	27	351 735,13	7 106 307,29	48,5	1,5	40,0	34,8	Yes
	AB asuinrakennus	28	351 282,35	7 106 114,17	44,1	1,5	40,0	34,4	Yes
	AC asuinrakennus	29	351 854,58	7 105 981,14	48,0	1,5	40,0	33,6	Yes
	AD asuinrakennus	30	359 468,59	7 105 365,18	70,0	1,5	40,0	37,5	Yes
	AE asuinrakennus	31	359 458,93	7 105 342,77	70,0	1,5	40,0	37,6	Yes
	AF asuinrakennus	32	359 656,18	7 105 262,75	70,0	1,5	40,0	36,9	Yes
	AG asuinrakennus	33	359 742,00	7 105 150,49	70,0	1,5	40,0	36,8	Yes
	AH asuinrakennus	34	355 306,39	7 105 078,42	54,8	1,5	40,0	38,2	Yes
	AI asuinrakennus	35	355 402,10	7 105 051,58	55,6	1,5	40,0	38,5	Yes
	AJ asuinrakennus	36	355 345,51	7 104 988,39	54,9	1,5	40,0	38,0	Yes
	AK asuinrakennus	37	355 609,85	7 104 789,45	57,1	1,5	40,0	38,4	Yes
	AL asuinrakennus	38	355 803,16	7 104 754,73	59,0	1,5	40,0	39,1	Yes
	AM asuinrakennus	39	355 828,34	7 104 697,93	59,1	1,5	40,0	38,9	Yes
	AN asuinrakennus	40	355 687,60	7 104 518,76	60,0	1,5	40,0	37,7	Yes
	AO asuinrakennus	41	355 304,57	7 104 200,95	60,0	1,5	40,0	35,5	Yes
	AP asuinrakennus	42	359 946,15	7 104 276,11	70,0	1,5	40,0	38,2	Yes
	AQ asuinrakennus	43	359 859,27	7 104 106,04	70,0	1,5	40,0	39,4	Yes
	AR asuinrakennus	44	360 139,63	7 104 057,46	70,0	1,5	40,0	37,5	Yes
	AS asuinrakennus	45	360 388,69	7 103 827,72	70,0	1,5	40,0	36,1	Yes
	AT asuinrakennus	46	360 592,96	7 103 564,98	76,0	1,5	40,0	35,2	Yes
	AU asuinrakennus	47	361 055,96	7 101 880,03	79,8	1,5	40,0	37,0	Yes
	AV asuinrakennus	48	357 504,55	7 100 420,61	70,0	1,5	40,0	34,4	Yes
	AW asuinrakennus	49	356 206,50	7 098 833,92	79,4	1,5	40,0	28,1	Yes
	AX lomarakennus	50	353 010,56	7 112 894,08	43,8	1,5	35,0	31,3	Yes
	AY lomarakennus	51	352 628,27	7 112 779,22	45,8	1,5	35,0	30,6	Yes
	AZ lomarakennus	52	350 812,08	7 108 952,85	43,5	1,5	35,0	34,9	Yes
	BA lomarakennus	53	347 832,27	7 108 468,40	41,2	1,5	35,0	26,9	Yes
	BB lomarakennus	54	347 905,54	7 107 401,35	40,0	1,5	35,0	27,8	Yes
	BC lomarakennus	55	359 658,00	7 106 790,69	70,0	1,5	35,0	35,0	Yes
	BD lomarakennus	56	353 161,33	7 105 731,04	50,0	1,5	35,0	34,8	Yes
	BE lomarakennus	57	363 205,30	7 101 533,91	70,0	1,5	35,0	30,6	Yes
	BF lomarakennus	58	363 291,09	7 101 070,91	70,0	1,5	35,0	30,9	Yes
	BG lomarakennus	59	363 361,47	7 100 703,56	70,0	1,5	35,0	30,9	Yes
	BH lomarakennus	60	357 586,33	7 100 564,37	70,0	1,5	35,0	35,0	Yes

Distances (m)

WTG	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	3803	3676	1992	1730	1703	1639	1570	984	1001	1091	1140	2377	2175	1953	1901	2271	2278	2300	8266	8112	8046	5425
2	2422	2407	2294	2211	2217	2159	2265	2731	2759	2911	2966	1919	1907	1879	1977	2034	2061	2083	7006	6919	7004	4610
3	6029	6082	6015	5860	5855	5785	5840	5803	5825	5937	5989	2484	2685	2911	2978	2597	2592	2573	3411	3251	3218	808
4	5111	4978	3146	2885	2854	2804	2694	1748	1742	1705	1714	2947	2728	2505	2395	2767	2760	2773	8645	8454	8298	5675
5	6006	5886	4131	3868	3838	3784	3682	2752	2746	2707	2714	3156	2954	2766	2636	2946	2931	2936	8453	8236	8014	5453
6	10541	10413	8540	8286	8255	8212	8088	7075	7061	6974	6960	7283	7129	7005	6874	7069	7046	7040	11022	10743	10317	8332
7	3957	4019	4244	4141	4144	4081	4170	4422	4449	4588	4644	1678	1870	2057	2186	1894	1913	1914	5054	4976	5094	2886
8	4402	4449	4474	4344	4343	4276	4350	4480	4505	4635	4690	1418	1633	1849	1965	1621	1634	1628	4803	4697	4763	2426
9	5056	5105	5072	4928	4925	4856	4920	4966	4990	5112	5166	1715	1933	2164	2257	1877	1882	1868	4242	4117	4147	1770
10	5548	5589	5442	5282	5277	5206	5259	5217	5240	5353	5405	1901	2104	2331	2402	2019	2016	1998	3989	3835	3803	1299
11	13580	13465	11664	11405	11374	11327	11211	10212	10200	10120	10110	9971	9851	9767	9642	9769	9743	9732	12565	12269	11754	10296
12	10096	9984	8225	7964	7933	7883	7773	6796	6786	6719	6714	6552	6418	6319	6191	6344	6319	6310	9985	9703	9267	7350
13	5418	5478	5531	5392	5390	5322	5389	5443	5467	5589	5642	2181	2398	2628	2718	2335	2337	2322	3768	3647	3695	1449
14	6370	6446	6600	6465	6463	6394	6462	6506	6529	6648	6701	3213	3424	3653	3731	3347	3346	3328	2695	2574	2647	1033
15	6101	5967	4106	3848	3816	3770	3653	2664	2653	2588	2585	3567	3358	3157	3031	3362	3350	3356	8947	8733	8513	5948
16	6794	6892	7259	7143	7144	7078	7158	7277	7301	7426	7480	4030	4246	4477	4563	4180	4181	4164	2044	2003	2257	1766

To be continued on next page...

Project: Windpark Mutkalampi

Description: PROKON Wind Energy Finland Oy VE2 Kalajoki-Kannus-Kokkola

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DECIBEL - Main Result

Calculation: 102 x P3000 3MW rd116,5 hh141,6

...continued from previous page

Table with 22 columns (WTG, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V) and 57 rows of numerical data representing decibel values for various wind turbines.

To be continued on next page...

Project: Windpark Mutkalampi

Description: PROKON Wind Energy Finland Oy VE2 Kalajoki-Kannus-Kokkola

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DECIBEL - Main Result

Calculation: 102 x P3000 3MW rd116,5 hh141,6

...continued from previous page

Table with columns WTG, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR. Rows 58-102.

Table with columns WTG, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH. Rows 1-20.

To be continued on next page...

Project:

Windpark Mutkalampi

Description:

PROKON Wind Energy Finland Oy
VE2 Kalajoki-Kannus-Kokkola

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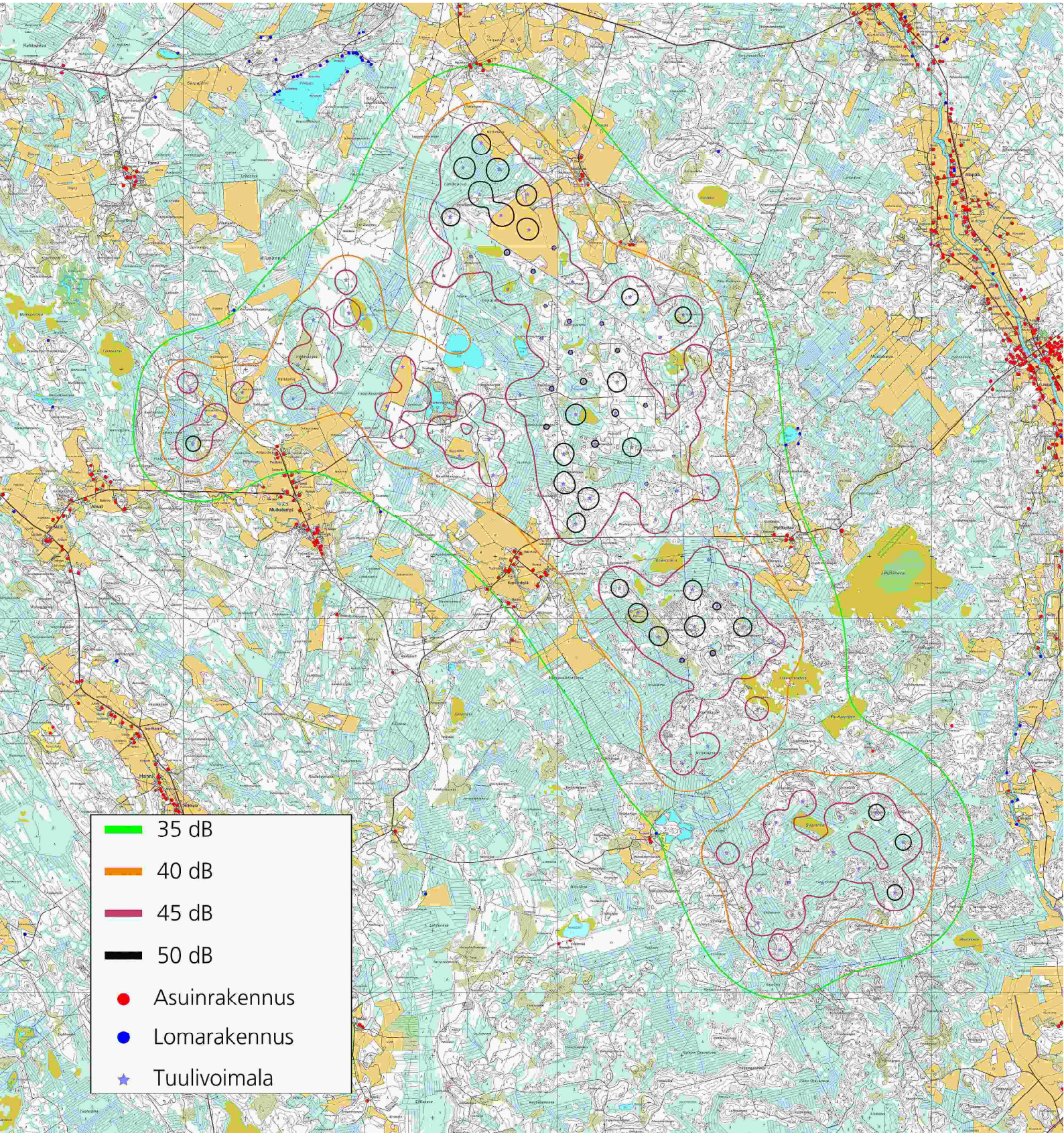
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DECIBEL - Main Result**Calculation:** 102 x P3000 3MW rd116,5 hh141,6

...continued from previous page

WTG	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH
83	3603	3290	1544	4043	5570	15118	15244	13715	15904	15326	6648	9928	1999	1863	1837	3964
84	9485	9818	11445	11242	12534	2207	2404	4328	7207	7618	6832	5673	13057	13461	13786	11126
85	9626	9958	11612	11555	12894	2162	2428	4795	7639	8078	6886	6134	13166	13579	13910	11435
86	9115	9448	11102	11077	12444	2645	2888	4819	7737	8114	6386	5813	12658	13070	13401	10955
87	8515	8848	10510	10580	11999	3259	3496	5061	8036	8343	5772	5602	12049	12462	12795	10455
88	5436	5766	7465	8099	9790	6371	6579	6843	9809	9800	2656	5276	8930	9348	9685	7954
89	4894	5200	6561	5923	7340	7395	7460	5969	8574	8280	3617	2966	8491	8822	9096	5804
90	4412	4718	6090	5606	7112	7788	7868	6451	9044	8733	3256	3360	8010	8343	8619	5480
91	4438	4730	6003	5251	6696	8062	8122	6460	8954	8591	3596	3135	7987	8300	8561	5132
92	5581	5906	7631	8476	10209	6418	6653	7208	10195	10222	2656	5790	8993	9423	9768	8328
93	6142	6475	8126	8361	9922	5557	5737	5898	8878	8902	3539	4652	9707	10111	10437	8226
94	6809	7122	8503	7577	8735	5701	5712	4091	6854	6700	5092	2223	10422	10759	11036	7476
95	2719	2707	2644	1788	3827	12195	12268	10328	12422	11832	4988	6465	4811	4959	5106	1622
96	6246	6577	8270	8761	10385	5572	5790	6352	9354	9423	3453	5277	9743	10162	10499	8621
97	2260	2571	4042	4622	6507	9615	9743	8603	11163	10803	2214	5323	5874	6222	6510	4466
98	1680	1984	3456	4364	6321	10190	10323	9183	11716	11333	2361	5834	5282	5628	5916	4202
99	4078	3828	2276	2823	4144	15002	15091	13178	15169	14520	7063	9271	3453	3317	3256	2782
100	4406	4736	6438	7245	9017	7368	7562	7475	10371	10267	1711	5358	7910	8325	8660	7094
101	3993	4325	5996	6691	8463	7710	7883	7506	10342	10181	1604	5104	7555	7958	8284	6541
102	10665	10937	11970	9745	10018	6719	6460	2239	2848	2320	9508	3200	14083	14341	14556	9714



Vaihtoehto 3 (VE 3)

WindPRO version 2.9.250 Jul 2013

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		Calculated: 24.9.2013 14:52/2.9.250

DECIBEL - Assumptions for noise calculation

Calculation: 57 x P3000 3MW rd116,5 hh141,6

Noise calculation model:

ISO 9613-2 General

Wind speed:

10,0 m/s

Ground attenuation:

General, Ground factor: 0,5

Meteorological coefficient, C0:

0,0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

Pure and Impulse tone penalty are added to WTG source noise

Height above ground level, when no value in NSA object:

1,5 m Don't allow override of model height with height from NSA object

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0,0 dB(A)

Octave data required

Air absorption

63	125	250	500	1 000	2 000	4 000	8 000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

WTG: PROKON_F+E 3.0MW-116 3030 116.5 !O!

Noise: Mode 0 - 106,5 dB(A) (Herstellerprognose)

Source	Source/Date	Creator	Edited
	2.2.2012	USER	28.8.2012 16:14

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data								
				63	125	250	500	1000	2000	4000	8000	
From Windcat	10,0	106,5	No	Generic data	88,1	95,1	98,5	101,1	100,9	98,0	93,2	83,7

WTG: PROKON_F+E 3.0MW-116 3030 116.5 !O!

Noise: Mode 2 - 102,5 dB(A) (Herstellerprognose)

Source	Source/Date	Creator	Edited
	21.2.2012	USER	25.10.2012 15:33

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data								
				63	125	250	500	1000	2000	4000	8000	
From Windcat	10,0	102,5	No	Generic data	84,1	91,1	94,5	97,1	96,9	94,0	89,2	79,7

NSA: asuinrakennus 01-A

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 40,0 dB(A)

Distance demand:

NSA: asuinrakennus 02-B

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 40,0 dB(A)

Distance demand:

NSA: asuinrakennus 03-C

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Project:

Windpark Mutkalampi

Description:

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Michael Sandberg / m.sandberg@prokon.net
Calculated:
24.9.2013 14:52/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 57 x P3000 3MW rd116,5 hh141,6**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 04-D**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 05-E**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 06-F**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 07-G**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 08-H**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 09-I**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 10-J**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 11-K**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 12-L**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

Project:

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Description:

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Calculated:
24.9.2013 14:52/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 57 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 13-M**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 14-N**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 15-O**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 16-P**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 17-Q**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 18-R**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 19-S**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 20-T**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 21-U**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

Project:

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DECIBEL - Assumptions for noise calculation**Calculation:** 57 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 22-V**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 23-W**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 24-X**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 25-Y**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 26-Z**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 27-AA**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 28-AB**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 29-AC**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 30-AD**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

Project:

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24.9.2013 14:52/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 57 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 31-AE**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 32-AF**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 33-AG**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 34-AH**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 35-AI**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 36-AJ**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 37-AK**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 38-AL**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 39-AM**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

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DECIBEL - Assumptions for noise calculation**Calculation:** 57 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 40-AN**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 41-AO**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 42-AP**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 43-AQ**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 44-AR**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 45-AS**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 46-AT**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 47-AU**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 48-AV**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

Project:

Windpark Mutkalampi

Description:

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24.9.2013 14:52/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 57 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 49-AW**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** Iomarakennus 50-AX**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 51-AY**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 52-AZ**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 53-BA**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 54-BB**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 55-BC**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 56-BD**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 57-BE**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:**

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DECIBEL - Assumptions for noise calculation

Calculation: 57 x P3000 3MW rd116,5 hh141,6

NSA: Iomarakennus 58-BF

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

NSA: Iomarakennus 59-BG

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

NSA: Iomarakennus 60-BH

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

Project: Windpark Mutkalampi	Description: PROKON Wind Energy Finland Oy VE1A Kannus-Kokkola	Printed/Page: 24.9.2013 14:53 / 2
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DECIBEL - Main Result

Calculation: 57 x P3000 3MW rd116,5 hh141,6

...continued from previous page

ETRS 89 Zone: 35				WTG type			Noise data				Wind speed	LwA,ref	Pure tones	
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Creator	Name	[m/s]	[dB(A)]	
54	356 290,22	7 105 529,63	60,0 WEA 091	Yes	PROKON_F+E	3.0MW-116-3 030	3 030	116,5	141,6	USER	Mode 0 - 106,5 dB(A) (Herstellerprognose)	10,0	106,5	0 dB h
55	356 705,93	7 108 743,38	57,9 WEA 093	Yes	PROKON_F+E	3.0MW-116-3 030	3 030	116,5	141,6	USER	Mode 2 - 102,5 dB(A) (Herstellerprognose)	10,0	102,5	0 dB h
56	354 605,37	7 107 420,62	54,3 WEA 094	Yes	PROKON_F+E	3.0MW-116-3 030	3 030	116,5	141,6	USER	Mode 2 - 102,5 dB(A) (Herstellerprognose)	10,0	102,5	0 dB h
57	350 150,10	7 106 813,78	43,3 WEA 102	Yes	PROKON_F+E	3.0MW-116-3 030	3 030	116,5	141,6	USER	Mode 0 - 106,5 dB(A) (Herstellerprognose)	10,0	106,5	0 dB h

h) Generic octave distribution used

Calculation Results

Sound Level

Noise sensitive area		ETRS 89 Zone: 35			Demands		Sound Level	Demands fulfilled ?	
No.	Name	East	North	Z	Imission height	Noise	From WTGs	Noise	
				[m]	[m]	[dB(A)]	[dB(A)]		
A	asuinrakennus 01	354 610,40	7 112 848,15	40,1	1,5	40,0	27,6	Yes	
B	asuinrakennus 02	354 808,22	7 112 797,86	41,0	1,5	40,0	27,8	Yes	
C	asuinrakennus 03	356 366,81	7 111 398,85	50,0	1,5	40,0	31,0	Yes	
D	asuinrakennus 04	356 379,76	7 111 135,08	50,0	1,5	40,0	31,9	Yes	
E	asuinrakennus 05	356 395,41	7 111 107,04	50,0	1,5	40,0	32,0	Yes	
F	asuinrakennus 06	356 352,60	7 111 046,81	50,0	1,5	40,0	32,3	Yes	
G	asuinrakennus 07	356 484,71	7 110 961,46	50,0	1,5	40,0	32,4	Yes	
H	asuinrakennus 08	356 980,97	7 110 057,19	50,0	1,5	40,0	34,6	Yes	
I	asuinrakennus 09	357 008,62	7 110 050,87	50,0	1,5	40,0	34,6	Yes	
J	asuinrakennus 10	357 154,85	7 110 003,30	50,0	1,5	40,0	34,3	Yes	
K	asuinrakennus 11	357 210,91	7 110 005,31	50,0	1,5	40,0	34,1	Yes	
L	asuinrakennus 12	354 023,58	7 108 546,97	50,0	1,5	40,0	39,0	Yes	
M	asuinrakennus 13	354 243,62	7 108 543,24	50,0	1,5	40,0	38,9	Yes	
N	asuinrakennus 14	354 471,25	7 108 580,65	50,0	1,5	40,0	39,0	Yes	
O	asuinrakennus 15	354 573,15	7 108 494,92	50,0	1,5	40,0	39,1	Yes	
P	asuinrakennus 16	354 196,79	7 108 416,95	50,0	1,5	40,0	39,1	Yes	
Q	asuinrakennus 17	354 202,00	7 108 389,71	50,0	1,5	40,0	39,2	Yes	
R	asuinrakennus 18	354 188,46	7 108 368,49	50,0	1,5	40,0	39,3	Yes	
S	asuinrakennus 19	348 515,16	7 106 465,43	40,0	1,5	40,0	29,6	Yes	
T	asuinrakennus 20	348 753,02	7 106 285,28	40,0	1,5	40,0	30,5	Yes	
U	asuinrakennus 21	349 058,56	7 105 779,09	40,0	1,5	40,0	30,3	Yes	
V	asuinrakennus 22	351 499,04	7 106 771,88	50,0	1,5	40,0	37,0	Yes	
W	asuinrakennus 23	351 495,69	7 106 655,08	50,0	1,5	40,0	36,3	Yes	
X	asuinrakennus 24	351 604,44	7 106 650,77	50,0	1,5	40,0	36,2	Yes	
Y	asuinrakennus 25	351 509,10	7 106 585,97	50,0	1,5	40,0	35,9	Yes	
Z	asuinrakennus 26	351 619,86	7 106 302,03	47,6	1,5	40,0	34,5	Yes	
AA	asuinrakennus 27	351 735,13	7 106 307,29	48,5	1,5	40,0	34,5	Yes	
AB	asuinrakennus 28	351 282,35	7 106 114,17	44,1	1,5	40,0	34,1	Yes	
AC	asuinrakennus 29	351 854,58	7 105 981,14	48,0	1,5	40,0	33,2	Yes	
AD	asuinrakennus 30	359 468,59	7 105 365,18	70,0	1,5	40,0	32,4	Yes	
AE	asuinrakennus 31	359 458,93	7 105 342,77	70,0	1,5	40,0	32,4	Yes	
AF	asuinrakennus 32	359 656,18	7 105 262,75	70,0	1,5	40,0	31,6	Yes	
AG	asuinrakennus 33	359 742,00	7 105 150,49	70,0	1,5	40,0	31,3	Yes	
AH	asuinrakennus 34	355 306,39	7 105 078,42	54,8	1,5	40,0	37,8	Yes	
AI	asuinrakennus 35	355 402,10	7 105 051,58	55,6	1,5	40,0	38,1	Yes	
AJ	asuinrakennus 36	355 345,51	7 104 988,39	54,9	1,5	40,0	37,6	Yes	
AK	asuinrakennus 37	355 609,85	7 104 789,45	57,1	1,5	40,0	37,9	Yes	
AL	asuinrakennus 38	355 803,16	7 104 754,73	59,0	1,5	40,0	38,6	Yes	
AM	asuinrakennus 39	355 828,34	7 104 697,93	59,1	1,5	40,0	38,4	Yes	
AN	asuinrakennus 40	355 687,60	7 104 518,76	60,0	1,5	40,0	37,1	Yes	
AO	asuinrakennus 41	355 304,57	7 104 200,95	60,0	1,5	40,0	34,6	Yes	
AP	asuinrakennus 42	359 946,15	7 104 276,11	70,0	1,5	40,0	30,3	Yes	
AQ	asuinrakennus 43	359 859,27	7 104 106,04	70,0	1,5	40,0	30,6	Yes	
AR	asuinrakennus 44	360 139,63	7 104 057,46	70,0	1,5	40,0	29,6	Yes	
AS	asuinrakennus 45	360 388,69	7 103 827,72	70,0	1,5	40,0	28,7	Yes	
AT	asuinrakennus 46	360 592,96	7 103 564,98	76,0	1,5	40,0	28,0	Yes	
AU	asuinrakennus 47	361 055,96	7 101 880,03	79,8	1,5	40,0	25,3	Yes	
AV	asuinrakennus 48	357 504,55	7 100 420,61	70,0	1,5	40,0	29,4	Yes	
AW	asuinrakennus 49	356 206,50	7 098 833,92	79,4	1,5	40,0	23,2	Yes	
AX	lomarakennus 50	353 010,56	7 112 894,08	43,8	1,5	35,0	26,6	Yes	

To be continued on next page...

Project: Windpark Mutkalampi

Description: PROKON Wind Energy Finland Oy VE1A Kannus-Kokkola

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DECIBEL - Main Result

Calculation: 57 x P3000 3MW rd116,5 hh141,6

...continued from previous page

Table with 23 columns (NSA 1-23) and multiple rows (BA, BB, BC, BD, BE, BF, BG, BH, WTG A-Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH) containing numerical data.

Project:

Windpark Mutkalampi

Description:

PROKON Wind Energy Finland Oy
VE1A Kannus-Kokkola

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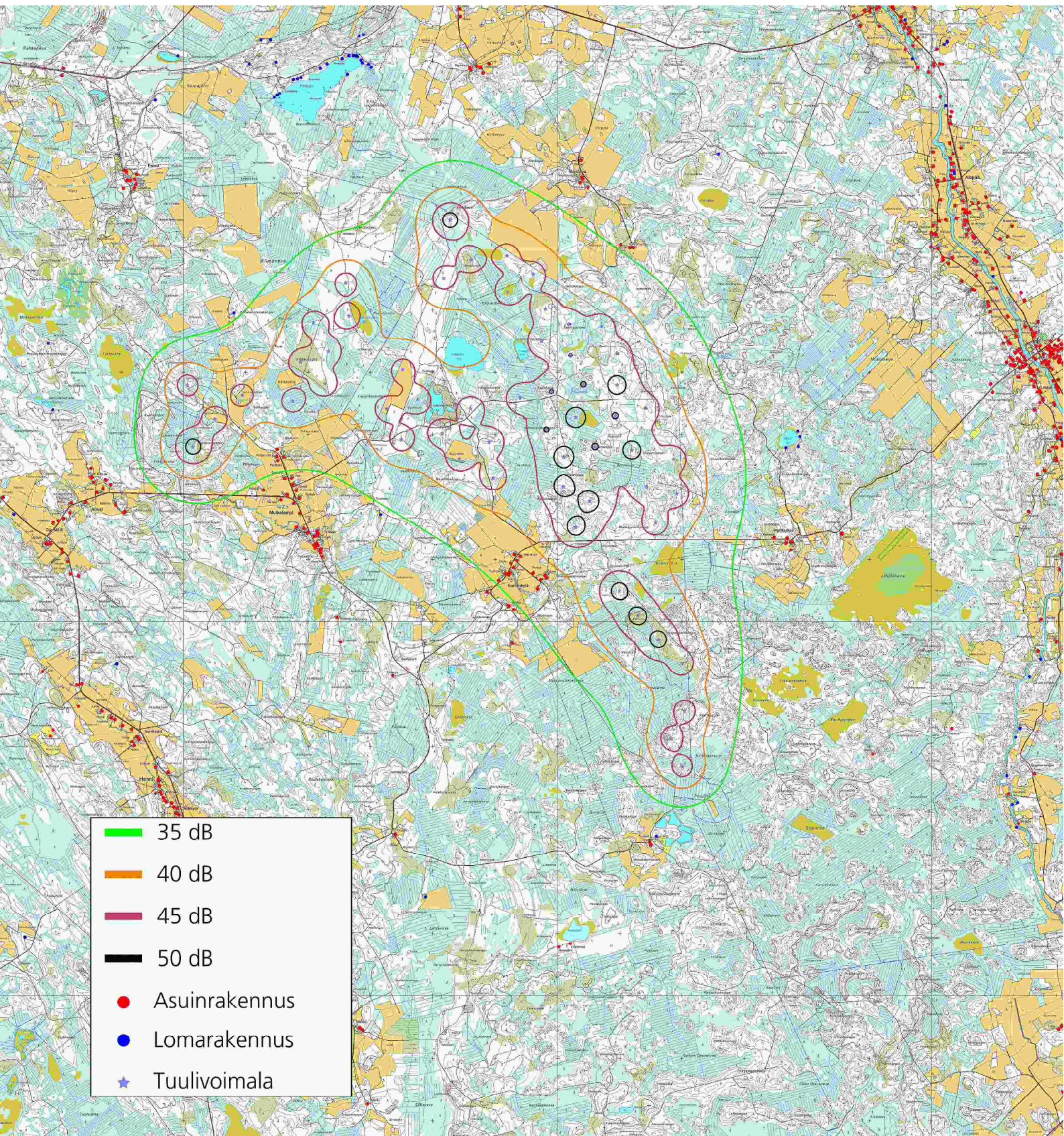
Calculated:

24.9.2013 14:52/2.9.250

DECIBEL - Main Result

Calculation: 57 x P3000 3MW rd116,5 hh141,6

WTG		45	46	47	48	49	50	51	52	53	54	55	56	57
NSA	A	10829	11188	11679	3032	3606	4492	5307	6838	7167	7509	4609	5428	7504
	B	10720	11084	11574	2988	3529	4397	5231	6749	7068	7418	4477	5381	7583
	C	8980	9381	9862	2363	2411	2965	3919	5233	5462	5870	2677	4351	7725
	D	8718	9118	9600	2206	2191	2710	3667	4970	5198	5606	2414	4117	7582
	E	8688	9088	9569	2202	2176	2687	3645	4943	5170	5578	2384	4098	7579
	F	8637	9036	9517	2132	2102	2618	3575	4881	5111	5518	2330	4025	7509
	G	8528	8931	9411	2196	2109	2570	3531	4804	5023	5435	2229	4009	7572
	H	7555	7970	8445	2382	1941	1990	2921	3984	4145	4580	1342	3549	7562
	I	7545	7961	8436	2409	1964	2002	2931	3984	4142	4578	1342	3563	7584
	J	7479	7900	8372	2550	2083	2063	2975	3975	4115	4556	1338	3629	7697
	K	7475	7897	8369	2607	2136	2103	3010	3992	4126	4569	1359	3670	7749
	L	7196	7456	7943	1399	1390	1718	1671	3150	3607	3774	2690	1268	4244
	M	7073	7343	7832	1325	1212	1498	1492	3007	3456	3643	2470	1179	4444
	N	6985	7268	7759	1244	1016	1272	1351	2903	3340	3552	2241	1168	4668
	O	6859	7145	7636	1322	1012	1168	1218	2776	3210	3427	2147	1075	4732
	P	6992	7256	7744	1460	1329	1546	1455	2938	3394	3566	2530	1077	4353
	Q	6966	7230	7718	1484	1343	1543	1435	2914	3370	3541	2529	1050	4348
	R	6956	7219	7706	1508	1367	1558	1435	2907	3364	3532	2545	1036	4327
	S	10289	10267	10632	6956	7256	7507	6979	7584	8017	7831	8502	6165	1672
	T	10001	9976	10338	6840	7111	7331	6777	7342	7770	7575	8324	5961	1494
	U	9536	9493	9844	6865	7073	7215	6599	7046	7458	7236	8202	5785	1504
	V	7772	7844	8266	4354	4475	4581	3989	4634	5085	4950	5568	3173	1350
	W	7712	7778	8197	4439	4545	4629	4018	4623	5070	4925	5613	3203	1355
	X	7618	7687	8109	4366	4459	4531	3913	4515	4962	4818	5514	3098	1463
	Y	7664	7727	8145	4479	4574	4645	4022	4603	5048	4896	5627	3207	1378
	Z	7424	7475	7887	4615	4662	4671	3998	4476	4909	4734	5642	3188	1556
	AA	7327	7382	7797	4537	4571	4567	3887	4361	4794	4621	5536	3079	1664
	AB	7629	7658	8058	4979	5042	5057	4379	4812	5236	5042	6027	3571	1331
	AC	7061	7102	7509	4723	4704	4632	3899	4243	4661	4459	5583	3105	1897
	AD	3133	3628	3970	6588	5800	4871	4642	3470	3009	3183	4364	5280	9431
	AE	3108	3604	3946	6596	5809	4878	4644	3466	3004	3174	4375	5280	9424
	AF	3134	3628	3950	6796	6008	5081	4855	3677	3213	3377	4563	5492	9632
	AG	3085	3577	3886	6935	6147	5219	4985	3789	3322	3473	4704	5616	9735
	AH	3706	3875	4345	4789	4213	3450	2524	1348	1484	1082	3923	2445	5440
	AI	3618	3793	4265	4830	4244	3466	2549	1317	1423	1009	3915	2499	5540
	AJ	3617	3781	4250	4884	4305	3535	2613	1401	1507	1089	3994	2542	5507
	AK	3287	3459	3930	5125	4520	3714	2819	1466	1463	1005	4103	2816	5823
	AL	3123	3311	3787	5200	4576	3747	2874	1448	1382	915	4090	2923	6016
	AM	3065	3250	3726	5261	4636	3804	2934	1499	1418	951	4140	2985	6060
	AN	3051	3203	3670	5406	4797	3983	3095	1703	1643	1177	4346	3097	5994
	AO	3182	3260	3699	5658	5091	4322	3401	2124	2118	1654	4754	3295	5779
	AP	2553	3018	3245	7691	6906	5961	5632	4294	3813	3865	5519	6198	10120
	AQ	2376	2836	3057	7756	6972	6023	5665	4296	3813	3842	5608	6212	10080
	AR	2568	3013	3199	7983	7197	6252	5917	4566	4084	4121	5809	6476	10363
	AS	2660	3076	3211	8321	7535	6591	6254	4894	4412	4438	6142	6809	10665
	AT	2736	3119	3204	8652	7867	6921	6576	5200	4718	4730	6475	7122	10937
	AU	3094	3243	3057	10224	9446	8490	8044	6561	6090	6003	8126	8503	11970
	AV	2222	1740	1350	9831	9165	8271	7482	5923	5606	5251	8361	7577	9745
	AW	4168	3673	3363	11098	10505	9678	8804	7340	7112	6696	9922	8735	10018
	AX	11478	11789	12282	3469	4216	5172	5808	7395	7788	8062	5557	5701	6719
	AY	11550	11847	12339	3565	4333	5291	5874	7460	7868	8122	5737	5712	6460
	AZ	9639	9782	10234	3896	4399	4950	4784	5969	6451	6460	5898	4091	2239
	BA	11787	11831	12234	6912	7412	7909	7618	8574	9044	8954	8878	6854	2848
	BB	11225	11231	11611	7127	7533	7912	7498	8280	8733	8591	8902	6700	2320
	BC	4513	5007	5376	5884	5113	4274	4334	3617	3256	3596	3539	5092	9508
	BD	5811	5890	6319	4335	4101	3785	2917	2966	3360	3135	4652	2223	3200
	BE	5268	5415	5201	11936	11148	10211	9885	8491	8010	7987	9707	10422	14083
	BF	5462	5570	5319	12322	11535	10593	10242	8822	8343	8300	10111	10759	14341
	BG	5640	5720	5443	12634	11848	10903	10533	9096	8619	8561	10437	11036	14556
	BH	2063	1585	1187	9719	9047	8148	7368	5804	5480	5132	8226	7476	9714



Vaihtoehto 4 (VE 4)

WindPRO version 2.9.250 Jul 2013

Project: Windpark Mutkalampi	Description: PROKON Wind Energy Finland Oy VE1B Kalajoki	Printed/Page 24.9.2013 14:04 / 1
		Licensed user: PROKON Regenerative Energien GmbH Kirchhoffstraße 3 DE-25524 Itzehoe +49 4821 6855 100 Michael Sandberg / m.sandberg@prokon.net
		Calculated: 24.9.2013 11:57/2.9.250

DECIBEL - Assumptions for noise calculation**Calculation:** 45 x P3000 3MW rd116,5 hh141,6**Noise calculation model:**

ISO 9613-2 General

Wind speed:

10,0 m/s

Ground attenuation:

General, Ground factor: 0,5

Meteorological coefficient, C0:

0,0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

Pure and Impulse tone penalty are added to WTG source noise

Height above ground level, when no value in NSA object:

1,5 m Don't allow override of model height with height from NSA object

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0,0 dB(A)

Octave data required

Air absorption

63	125	250	500	1 000	2 000	4 000	8 000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

WTG: PROKON_F+E 3.0MW-116 3030 116.5 !O!**Noise:** Mode 2 - 102,5 dB(A) (Herstellerprognose)

Source	Source/Date	Creator	Edited
	21.2.2012	USER	25.10.2012 15:33

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data								
				63	125	250	500	1000	2000	4000	8000	
From Windcat	10,0	102,5	No	Generic data	84,1	91,1	94,5	97,1	96,9	94,0	89,2	79,7

WTG: PROKON_F+E 3.0MW-116 3030 116.5 !O!**Noise:** Mode 0 - 106,5 dB(A) (Herstellerprognose)

Source	Source/Date	Creator	Edited
	2.2.2012	USER	28.8.2012 16:14

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data								
				63	125	250	500	1000	2000	4000	8000	
From Windcat	10,0	106,5	No	Generic data	88,1	95,1	98,5	101,1	100,9	98,0	93,2	83,7

NSA: asuinrakennus 01-A**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 02-B**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 03-C**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m

Project:

Windpark Mutkalampi

Description:

PROKON Wind Energy Finland Oy
VE1B Kalajoki

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Licensed user:

PROKON Regenerative Energien GmbH
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Michael Sandberg / m.sandberg@prokon.net
Calculated:
24.9.2013 11:57/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 45 x P3000 3MW rd116,5 hh141,6**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 04-D**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 05-E**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 06-F**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 07-G**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 08-H**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 09-I**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 10-J**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 11-K**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 12-L**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

Project:

Windpark Mutkalampi

Description:

PROKON Wind Energy Finland Oy
VE1B Kalajoki

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Michael Sandberg / m.sandberg@prokon.net
Calculated:
24.9.2013 11:57/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 45 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 13-M**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 14-N**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 15-O**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 16-P**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 17-Q**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 18-R**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 19-S**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 20-T**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 21-U**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

Project:

Windpark Mutkalampi

Description:

PROKON Wind Energy Finland Oy
VE1B Kalajoki

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Michael Sandberg / m.sandberg@prokon.net
Calculated:
24.9.2013 11:57/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 45 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 22-V**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 23-W**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 24-X**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 25-Y**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 26-Z**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 27-AA**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 28-AB**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 29-AC**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 30-AD**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

Project:

Windpark Mutkalampi

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24.9.2013 11:57/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 45 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 31-AE**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 32-AF**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 33-AG**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 34-AH**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 35-AI**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 36-AJ**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 37-AK**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 38-AL**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 39-AM**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

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DECIBEL - Assumptions for noise calculation**Calculation:** 45 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 40-AN**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 41-AO**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 42-AP**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 43-AQ**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 44-AR**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 45-AS**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 46-AT**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 47-AU**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** asuinrakennus 48-AV**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:**

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Calculated:
24.9.2013 11:57/2.9.250**DECIBEL - Assumptions for noise calculation****Calculation:** 45 x P3000 3MW rd116,5 hh141,6**NSA:** asuinrakennus 49-AW**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 40,0 dB(A)**Distance demand:****NSA:** Iomarakennus 50-AX**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 51-AY**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 52-AZ**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 53-BA**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 54-BB**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 55-BC**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 56-BD**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:****NSA:** Iomarakennus 57-BE**Predefined calculation standard:****Imission height(a.g.l.):** 1,5 m**Noise demand:** 35,0 dB(A)**Distance demand:**

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DECIBEL - Assumptions for noise calculation

Calculation: 45 x P3000 3MW rd116,5 hh141,6

NSA: Iomarakennus 58-BF

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

NSA: Iomarakennus 59-BG

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

NSA: Iomarakennus 60-BH

Predefined calculation standard:

Imission height(a.g.l.): 1,5 m

Noise demand: 35,0 dB(A)

Distance demand:

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DECIBEL - Main Result

Calculation: 45 x P3000 3MW rd116,5 hh141,6

Sound Level

Noise sensitive area		ETRS 89 Zone: 35			Imission height [m]	Demands Noise [dB(A)]	Sound Level From WTGs [dB(A)]	Demands fulfilled ? Noise
No.	Name	East	North	Z [m]				
A	asuinrakennus 01	354 610,40	7 112 848,15	40,1	1,5	40,0	34,4	Yes
B	asuinrakennus 02	354 808,22	7 112 797,86	41,0	1,5	40,0	34,9	Yes
C	asuinrakennus 03	356 366,81	7 111 398,85	50,0	1,5	40,0	37,4	Yes
D	asuinrakennus 04	356 379,76	7 111 135,08	50,0	1,5	40,0	38,2	Yes
E	asuinrakennus 05	356 395,41	7 111 107,04	50,0	1,5	40,0	38,2	Yes
F	asuinrakennus 06	356 352,60	7 111 046,81	50,0	1,5	40,0	38,7	Yes
G	asuinrakennus 07	356 484,71	7 110 961,46	50,0	1,5	40,0	38,0	Yes
H	asuinrakennus 08	356 980,97	7 110 057,19	50,0	1,5	40,0	38,0	Yes
I	asuinrakennus 09	357 008,62	7 110 050,87	50,0	1,5	40,0	37,9	Yes
J	asuinrakennus 10	357 154,85	7 110 003,30	50,0	1,5	40,0	37,8	Yes
K	asuinrakennus 11	357 210,91	7 110 005,31	50,0	1,5	40,0	37,8	Yes
L	asuinrakennus 12	354 023,58	7 108 546,97	50,0	1,5	40,0	31,1	Yes
M	asuinrakennus 13	354 243,62	7 108 543,24	50,0	1,5	40,0	31,6	Yes
N	asuinrakennus 14	354 471,25	7 108 580,65	50,0	1,5	40,0	32,3	Yes
O	asuinrakennus 15	354 573,15	7 108 494,92	50,0	1,5	40,0	32,2	Yes
P	asuinrakennus 16	354 196,79	7 108 416,95	50,0	1,5	40,0	31,1	Yes
Q	asuinrakennus 17	354 202,00	7 108 389,71	50,0	1,5	40,0	31,0	Yes
R	asuinrakennus 18	354 188,46	7 108 368,49	50,0	1,5	40,0	30,9	Yes
S	asuinrakennus 19	348 515,16	7 106 465,43	40,0	1,5	40,0	19,0	Yes
T	asuinrakennus 20	348 753,02	7 106 285,28	40,0	1,5	40,0	19,2	Yes
U	asuinrakennus 21	349 058,56	7 105 779,09	40,0	1,5	40,0	19,3	Yes
V	asuinrakennus 22	351 499,04	7 106 771,88	50,0	1,5	40,0	23,1	Yes
W	asuinrakennus 23	351 495,69	7 106 655,08	50,0	1,5	40,0	23,0	Yes
X	asuinrakennus 24	351 604,44	7 106 650,77	50,0	1,5	40,0	23,1	Yes
Y	asuinrakennus 25	351 509,10	7 106 585,97	50,0	1,5	40,0	22,9	Yes
Z	asuinrakennus 26	351 619,86	7 106 302,03	47,6	1,5	40,0	22,9	Yes
AA	asuinrakennus 27	351 735,13	7 106 307,29	48,5	1,5	40,0	23,0	Yes
AB	asuinrakennus 28	351 282,35	7 106 114,17	44,1	1,5	40,0	22,3	Yes
AC	asuinrakennus 29	351 854,58	7 105 981,14	48,0	1,5	40,0	23,0	Yes
AD	asuinrakennus 30	359 468,59	7 105 365,18	70,0	1,5	40,0	35,9	Yes
AE	asuinrakennus 31	359 458,93	7 105 342,77	70,0	1,5	40,0	36,1	Yes
AF	asuinrakennus 32	359 656,18	7 105 262,75	70,0	1,5	40,0	35,4	Yes
AG	asuinrakennus 33	359 742,00	7 105 150,49	70,0	1,5	40,0	35,4	Yes
AH	asuinrakennus 34	355 306,39	7 105 078,42	54,8	1,5	40,0	28,1	Yes
AI	asuinrakennus 35	355 402,10	7 105 051,58	55,6	1,5	40,0	28,3	Yes
AJ	asuinrakennus 36	355 345,51	7 104 988,39	54,9	1,5	40,0	28,2	Yes
AK	asuinrakennus 37	355 609,85	7 104 789,45	57,1	1,5	40,0	28,9	Yes
AL	asuinrakennus 38	355 803,16	7 104 754,73	59,0	1,5	40,0	29,6	Yes
AM	asuinrakennus 39	355 828,34	7 104 697,93	59,1	1,5	40,0	29,7	Yes
AN	asuinrakennus 40	355 687,60	7 104 518,76	60,0	1,5	40,0	29,2	Yes
AO	asuinrakennus 41	355 304,57	7 104 200,95	60,0	1,5	40,0	28,0	Yes
AP	asuinrakennus 42	359 946,15	7 104 276,11	70,0	1,5	40,0	37,4	Yes
AQ	asuinrakennus 43	359 859,27	7 104 106,04	70,0	1,5	40,0	38,8	Yes
AR	asuinrakennus 44	360 139,63	7 104 057,46	70,0	1,5	40,0	36,7	Yes
AS	asuinrakennus 45	360 388,69	7 103 827,72	70,0	1,5	40,0	35,3	Yes
AT	asuinrakennus 46	360 592,96	7 103 564,98	76,0	1,5	40,0	34,2	Yes
AU	asuinrakennus 47	361 055,96	7 101 880,03	79,8	1,5	40,0	36,7	Yes
AV	asuinrakennus 48	357 504,55	7 100 420,61	70,0	1,5	40,0	32,7	Yes
AW	asuinrakennus 49	356 206,50	7 098 833,92	79,4	1,5	40,0	26,4	Yes
AX	lomarakenus 50	353 010,56	7 112 894,08	43,8	1,5	35,0	29,5	Yes
AY	lomarakenus 51	352 628,27	7 112 779,22	45,8	1,5	35,0	28,5	Yes
AZ	lomarakenus 52	350 812,08	7 108 952,85	43,5	1,5	35,0	23,6	Yes
BA	lomarakenus 53	347 832,27	7 108 468,40	41,2	1,5	35,0	18,7	Yes
BB	lomarakenus 54	347 905,54	7 107 401,35	40,0	1,5	35,0	18,5	Yes
BC	lomarakenus 55	359 658,00	7 106 790,69	70,0	1,5	35,0	32,2	Yes
BD	lomarakenus 56	353 161,33	7 105 731,04	50,0	1,5	35,0	24,6	Yes
BE	lomarakenus 57	363 205,30	7 101 533,91	70,0	1,5	35,0	30,0	Yes
BF	lomarakenus 58	363 291,09	7 101 070,91	70,0	1,5	35,0	30,4	Yes
BG	lomarakenus 59	363 361,47	7 100 703,56	70,0	1,5	35,0	30,5	Yes
BH	lomarakenus 60	357 586,33	7 100 564,37	70,0	1,5	35,0	33,1	Yes

Project:

Windpark Mutkalampi

Description:

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DECIBEL - Main Result

Calculation: 45 x P3000 3MW rd116,5 hh141,6

...continued from previous page

Table with 23 columns (NSA 23-44) and 44 rows (WTG K-BH) containing numerical data points for various wind turbine configurations.

WTG

Table with 2 columns (NSA, WTG) listing turbine types: A 6727, B 6583, C 4641, D 4392, E 4360, F 4321, G 4191, H 3168, I 3153, J 3060, K 3046, L 4313, M 4105, N 3908, O 3781, P 4107, Q 4093.

To be continued on next page...

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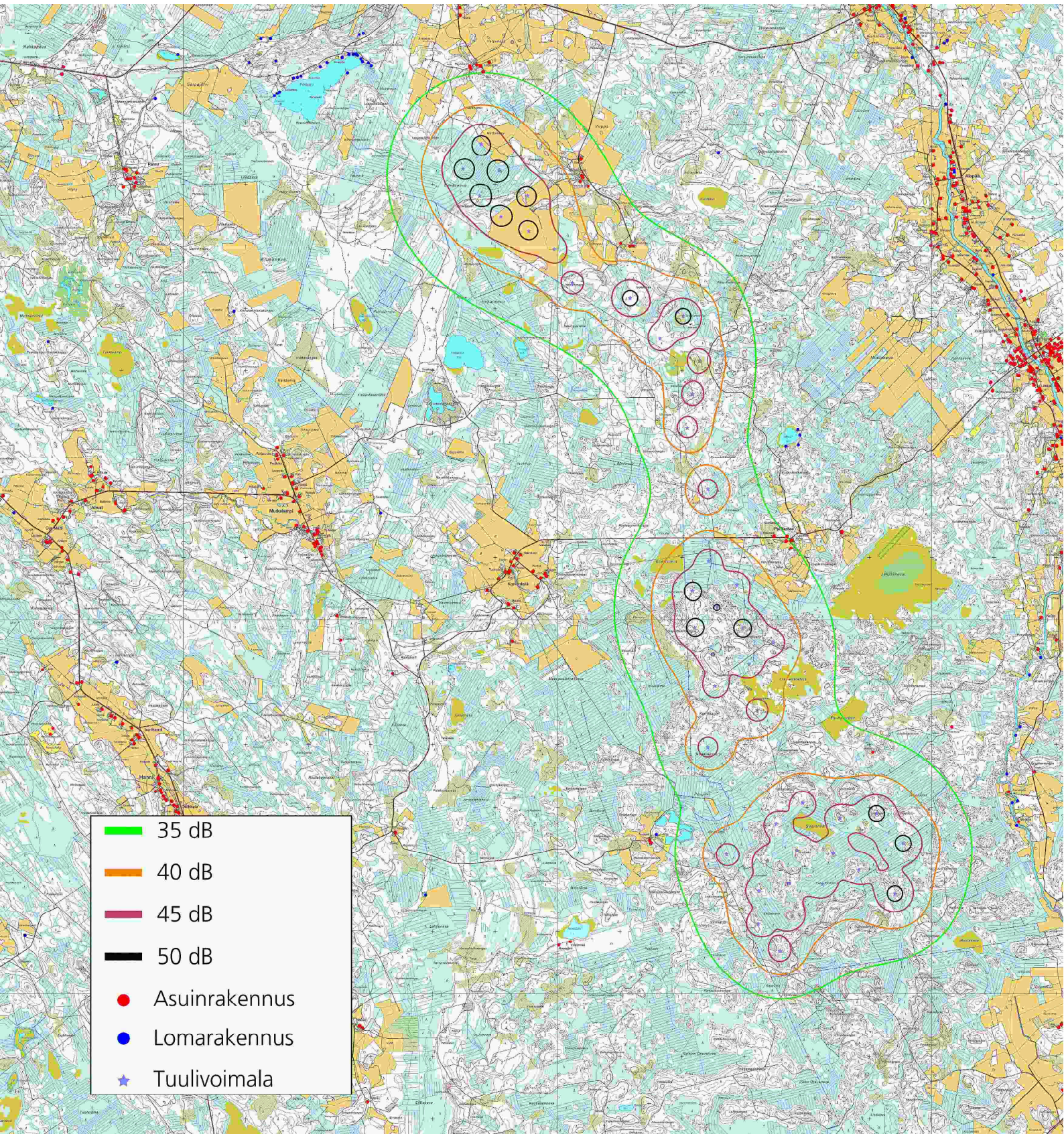
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DECIBEL - Main Result**Calculation:** 45 x P3000 3MW rd116,5 hh141,6

...continued from previous page

WTG

NSA	45
R	4099
S	9587
T	9363
U	9118
V	6590
W	6600
X	6492
Y	6592
Z	6510
AA	6394
AB	6869
AC	6325
AD	2211
AE	2222
AF	2409
AG	2550
AH	3426
AI	3365
AJ	3448
AK	3375
AL	3260
AM	3284
AN	3511
AO	4005
AP	3373
AQ	3470
AR	3662
AS	3993
AT	4325
AU	5996
AV	6691
AW	8463
AX	7710
AY	7883
AZ	7506
BA	10342
BB	10181
BC	1604
BD	5104
BE	7555
BF	7958
BG	8284
BH	6541



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DECIBEL - Main Result**Calculation:** 36 x P3000-116 3MW RD116,5 HH141,6

...continued from previous page

Noise sensitive area		GK (3 deg)-S42/83 (DE New States 1995 <±3m) Zonations				Sound Level	Demands fulfilled ?	
No.	Name	East	North	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	
asuinrakennus 09	asuinrakennus 09	8.503.370	7.109.733	50,0	1,5	40,0	31,2	Yes
asuinrakennus 10	asuinrakennus 10	8.503.519	7.109.692	50,0	1,5	40,0	31,4	Yes
asuinrakennus 11	asuinrakennus 11	8.503.575	7.109.697	50,0	1,5	40,0	31,3	Yes
asuinrakennus 12	asuinrakennus 12	8.500.459	7.108.090	50,0	1,5	40,0	36,2	Yes
asuinrakennus 13	asuinrakennus 13	8.500.679	7.108.097	50,7	1,5	40,0	35,3	Yes
asuinrakennus 14	asuinrakennus 14	8.500.905	7.108.145	51,0	1,5	40,0	34,6	Yes
asuinrakennus 15	asuinrakennus 15	8.501.010	7.108.064	51,0	1,5	40,0	34,8	Yes
asuinrakennus 16	asuinrakennus 16	8.500.638	7.107.968	51,0	1,5	40,0	36,1	Yes
asuinrakennus 17	asuinrakennus 17	8.500.599	7.107.860	51,0	1,5	40,0	36,9	Yes
asuinrakennus 18	asuinrakennus 18	8.500.595	7.107.747	51,0	1,5	40,0	37,6	Yes
asuinrakennus 19	asuinrakennus 19	8.495.054	7.105.751	37,1	1,5	40,0	20,0	Yes
asuinrakennus 20	asuinrakennus 20	8.495.300	7.105.582	34,7	1,5	40,0	20,4	Yes
asuinrakennus 21	asuinrakennus 21	8.495.629	7.105.091	39,4	1,5	40,0	20,6	Yes
asuinrakennus 22	asuinrakennus 22	8.498.020	7.106.198	48,3	1,5	40,0	28,5	Yes
asuinrakennus 23	asuinrakennus 23	8.498.023	7.106.081	48,0	1,5	40,0	28,1	Yes
asuinrakennus 24	asuinrakennus 24	8.498.131	7.106.082	49,0	1,5	40,0	28,5	Yes
asuinrakennus 25	asuinrakennus 25	8.498.039	7.106.012	48,0	1,5	40,0	28,0	Yes
asuinrakennus 26	asuinrakennus 26	8.498.163	7.105.734	46,9	1,5	40,0	27,6	Yes
asuinrakennus 27	asuinrakennus 27	8.498.278	7.105.745	48,0	1,5	40,0	28,0	Yes
asuinrakennus 28	asuinrakennus 28	8.497.835	7.105.530	43,7	1,5	40,0	26,2	Yes
asuinrakennus 29	asuinrakennus 29	8.498.413	7.105.424	46,6	1,5	40,0	27,4	Yes
asuinrakennus 30	asuinrakennus 30	8.506.049	7.105.168	70,0	1,5	40,0	29,9	Yes
asuinrakennus 31	asuinrakennus 31	8.506.040	7.105.145	70,0	1,5	40,0	29,9	Yes
asuinrakennus 32	asuinrakennus 32	8.506.241	7.105.074	70,0	1,5	40,0	29,0	Yes
asuinrakennus 33	asuinrakennus 33	8.506.332	7.104.966	70,0	1,5	40,0	28,5	Yes
asuinrakennus 34	asuinrakennus 34	8.501.904	7.104.685	54,9	1,5	40,0	31,8	Yes
asuinrakennus 35	asuinrakennus 35	8.502.001	7.104.663	55,5	1,5	40,0	31,9	Yes
asuinrakennus 36	asuinrakennus 36	8.501.947	7.104.597	55,0	1,5	40,0	31,5	Yes
asuinrakennus 37	asuinrakennus 37	8.502.221	7.104.411	57,0	1,5	40,0	31,1	Yes
asuinrakennus 38	asuinrakennus 38	8.502.415	7.104.385	59,0	1,5	40,0	31,3	Yes
asuinrakennus 39	asuinrakennus 39	8.502.443	7.104.330	59,0	1,5	40,0	31,1	Yes
asuinrakennus 40	asuinrakennus 40	8.502.311	7.104.144	58,2	1,5	40,0	30,2	Yes
asuinrakennus 41	asuinrakennus 41	8.501.943	7.103.808	59,8	1,5	40,0	28,5	Yes
asuinrakennus 42	asuinrakennus 42	8.506.577	7.104.102	69,0	1,5	40,0	26,6	Yes
asuinrakennus 43	asuinrakennus 43	8.506.498	7.103.928	69,6	1,5	40,0	26,6	Yes
asuinrakennus 44	asuinrakennus 44	8.506.781	7.103.893	70,0	1,5	40,0	26,2	Yes
asuinrakennus 45	asuinrakennus 45	8.507.040	7.103.675	70,0	1,5	40,0	25,8	Yes
asuinrakennus 46	asuinrakennus 46	8.507.257	7.103.422	76,2	1,5	40,0	25,7	Yes
asuinrakennus 47	asuinrakennus 47	8.507.798	7.101.760	79,6	1,5	40,0	29,5	Yes
asuinrakennus 48	asuinrakennus 48	8.504.319	7.100.135	70,0	1,5	40,0	29,3	Yes
asuinrakennus 49	asuinrakennus 49	8.503.097	7.098.489	77,0	1,5	40,0	24,1	Yes
lomarakennus 50	lomarakennus 50	8.499.242	7.112.385	44,8	1,5	35,0	21,7	Yes
lomarakennus 51	lomarakennus 51	8.498.866	7.112.252	42,0	1,5	35,0	21,8	Yes
lomarakennus 52	lomarakennus 52	8.497.231	7.108.344	43,0	1,5	35,0	28,2	Yes
lomarakennus 53	lomarakennus 53	8.494.277	7.107.720	40,6	1,5	35,0	19,2	Yes
lomarakennus 54	lomarakennus 54	8.494.401	7.106.657	40,0	1,5	35,0	19,3	Yes
lomarakennus 55	lomarakennus 55	8.506.171	7.106.601	68,0	1,5	35,0	31,4	Yes
lomarakennus 56	lomarakennus 56	8.499.730	7.105.236	47,9	1,5	35,0	30,0	Yes
lomarakennus 57	lomarakennus 57	8.509.962	7.101.516	68,2	1,5	35,0	23,8	Yes
lomarakennus 58	lomarakennus 58	8.510.070	7.101.057	66,1	1,5	35,0	24,0	Yes
lomarakennus 59	lomarakennus 59	8.510.157	7.100.694	66,5	1,5	35,0	24,1	Yes
lomarakennus 60	lomarakennus 60	8.504.394	7.100.283	70,0	1,5	35,0	29,5	Yes

Project:

Windpark Mutkalampi

Description:

PROKON Wind Energy Finland Oy
VE1C

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05.02.2014 13:41 / 4

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Calculated:

23.01.2014 11:34/2.9.269

DECIBEL - Main Result**Calculation:** 36 x P3000-116 3MW RD116,5 HH141,6

...continued from previous page

NSA	WTG														
	WTG 030	WTG 031	WTG 032	WTG 033	WTG 034	WTG 037	WTG 038	WTG 043	WTG 045	WTG 047	WTG 049	WTG 050	WTG 052	WTG 060	
asuinrakennus 09	1946	4086	2600	2859	3519	4026	3197	3265	4582	4167	3299	4099	2314	3541	
asuinrakennus 10	1969	4175	2623	2854	3515	4131	3211	3239	4676	4235	3246	4023	2311	3462	
asuinrakennus 11	1998	4222	2652	2873	3534	4181	3237	3252	4724	4276	3248	4015	2331	3453	
asuinrakennus 12	2199	1006	2062	2596	2807	713	2313	3108	1364	1532	3639	4620	2500	4301	
asuinrakennus 13	1981	1082	1862	2404	2646	881	2145	2926	1496	1526	3447	4435	2289	4103	
asuinrakennus 14	1761	1232	1682	2235	2521	1093	2012	2770	1680	1594	3275	4270	2088	3923	
asuinrakennus 15	1647	1228	1550	2102	2390	1147	1880	2637	1700	1535	3143	4137	1962	3792	
asuinrakennus 16	2014	948	1851	2381	2592	774	2097	2892	1371	1398	3424	4404	2297	4088	
asuinrakennus 17	2054	834	1854	2372	2553	688	2066	2872	1264	1291	3413	4386	2314	4082	
asuinrakennus 18	2064	732	1829	2334	2490	643	2010	2823	1180	1179	3372	4337	2302	4045	
asuinrakennus 19	7902	5359	7490	7819	7582	5247	7327	8095	4838	5662	8681	9407	8013	9352	
asuinrakennus 20	7715	5168	7288	7604	7351	5080	7108	7867	4646	5446	8452	9163	7812	9119	
asuinrakennus 21	7572	5031	7108	7387	7090	5002	6883	7614	4508	5240	8192	8858	7631	8847	
asuinrakennus 22	4942	2398	4500	4819	4597	2387	4329	5103	1874	2662	5693	6454	5024	6369	
asuinrakennus 23	4982	2442	4529	4836	4599	2454	4342	5109	1921	2679	5697	6445	5053	6370	
asuinrakennus 24	4881	2344	4424	4729	4490	2367	4234	5000	1823	2572	5588	6337	4948	6262	
asuinrakennus 25	4993	2457	4532	4832	4586	2482	4336	5098	1937	2676	5685	6426	5056	6357	
asuinrakennus 26	4994	2489	4505	4773	4489	2576	4269	5008	1982	2630	5590	6298	5027	6254	
asuinrakennus 27	4886	2388	4393	4659	4373	2489	4154	4893	1885	2517	5475	6183	4915	6139	
asuinrakennus 28	5378	2875	4884	5143	4842	2953	4637	5365	2367	3007	5944	6631	5406	6603	
asuinrakennus 29	4921	2483	4397	4624	4293	2649	4112	4820	2008	2519	5393	6059	4914	6045	
asuinrakennus 30	4373	6124	4261	3712	3611	6523	4037	3210	6540	5570	2669	1701	3916	2033	
asuinrakennus 31	4381	6123	4266	3715	3610	6524	4038	3212	6538	5568	2672	1701	3922	2039	
asuinrakennus 32	4582	6336	4474	3925	3823	6737	4250	3424	6750	5780	2882	1914	4126	2244	
asuinrakennus 33	4720	6457	4608	4057	3944	6861	4376	3552	6868	5897	3014	2040	4263	2380	
asuinrakennus 34	3324	2939	2687	2415	1760	3460	2070	2164	3108	2260	2524	2782	2952	2986	
asuinrakennus 35	3325	3013	2693	2402	1744	3533	2075	2130	3192	2333	2472	2703	2942	2918	
asuinrakennus 36	3400	3036	2766	2482	1825	3558	2148	2214	3202	2357	2557	2779	3021	3000	
asuinrakennus 37	3539	3346	2923	2585	1925	3866	2304	2252	3526	2666	2525	2627	3130	2902	
asuinrakennus 38	3546	3485	2945	2575	1920	4003	2330	2206	3683	2804	2437	2477	3120	2778	
asuinrakennus 39	3600	3546	3001	2626	1972	4064	2387	2251	3741	2865	2470	2486	3171	2798	
asuinrakennus 40	3795	3616	3187	2830	2172	4137	2569	2468	3781	2936	2697	2703	3375	3023	
asuinrakennus 41	4176	3713	3548	3236	2576	4235	2929	2915	3812	3046	3177	3199	3780	3520	
asuinrakennus 42	5477	7014	5297	4733	4526	7449	4994	4196	7388	6413	3707	2700	5000	3130	
asuinrakennus 43	5545	7019	5344	4778	4545	7462	5022	4234	7384	6410	3761	2753	5062	3205	
asuinrakennus 44	5769	7288	5586	5022	4806	7727	5278	4483	7657	6683	3997	2990	5292	3422	
asuinrakennus 45	6107	7617	5925	5360	5140	8059	5614	4821	7982	7008	4336	3329	5630	3760	
asuinrakennus 46	6439	7925	6252	5686	5456	8371	5933	5144	8284	7311	4664	3657	5960	4092	
asuinrakennus 47	8028	9258	7772	7204	6884	9735	7385	6645	9563	8609	6222	5224	7535	5710	
asuinrakennus 48	7964	8077	7452	6969	6389	8600	6875	6454	8184	7403	6344	5647	7474	6205	
asuinrakennus 49	9444	9079	8870	8450	7819	9592	8260	7987	9075	8440	7984	7418	8983	7956	
lomarakennus 50	5614	5370	5947	6499	6962	4879	6452	7064	5483	5984	7426	8416	6114	7937	
lomarakennus 51	5750	5324	6045	6605	7040	4820	6526	7170	5399	5957	7556	8554	6243	8089	
lomarakennus 52	5436	3251	5243	5728	5762	2857	5342	6174	2889	3857	6747	7670	5716	7431	
lomarakennus 53	8376	5992	8107	8541	8460	5703	8103	8925	5527	6481	9515	10366	8606	10203	
lomarakennus 54	8347	5855	8003	8386	8223	5651	7917	8717	5353	6256	9309	10098	8518	9991	
lomarakennus 55	3759	5952	3864	3403	3566	6265	3853	3056	6430	5513	2467	1895	3402	1801	
lomarakennus 56	3970	1939	3374	3494	3075	2339	2980	3607	1689	1624	4159	4762	3862	4787	
lomarakennus 57	9720	11215	9557	8992	8761	11669	9242	8453	11557	10588	7965	6959	9251	7371	
lomarakennus 58	10106	11542	9925	9359	9107	12004	9594	8814	11871	10907	8339	7331	9632	7757	
lomarakennus 59	10420	11810	10225	9658	9391	12277	9882	9110	12130	11169	8644	7636	9942	8072	
lomarakennus 60	7836	7989	7330	6843	6268	8512	6756	6324	8105	7313	6205	5498	7345	6057	

