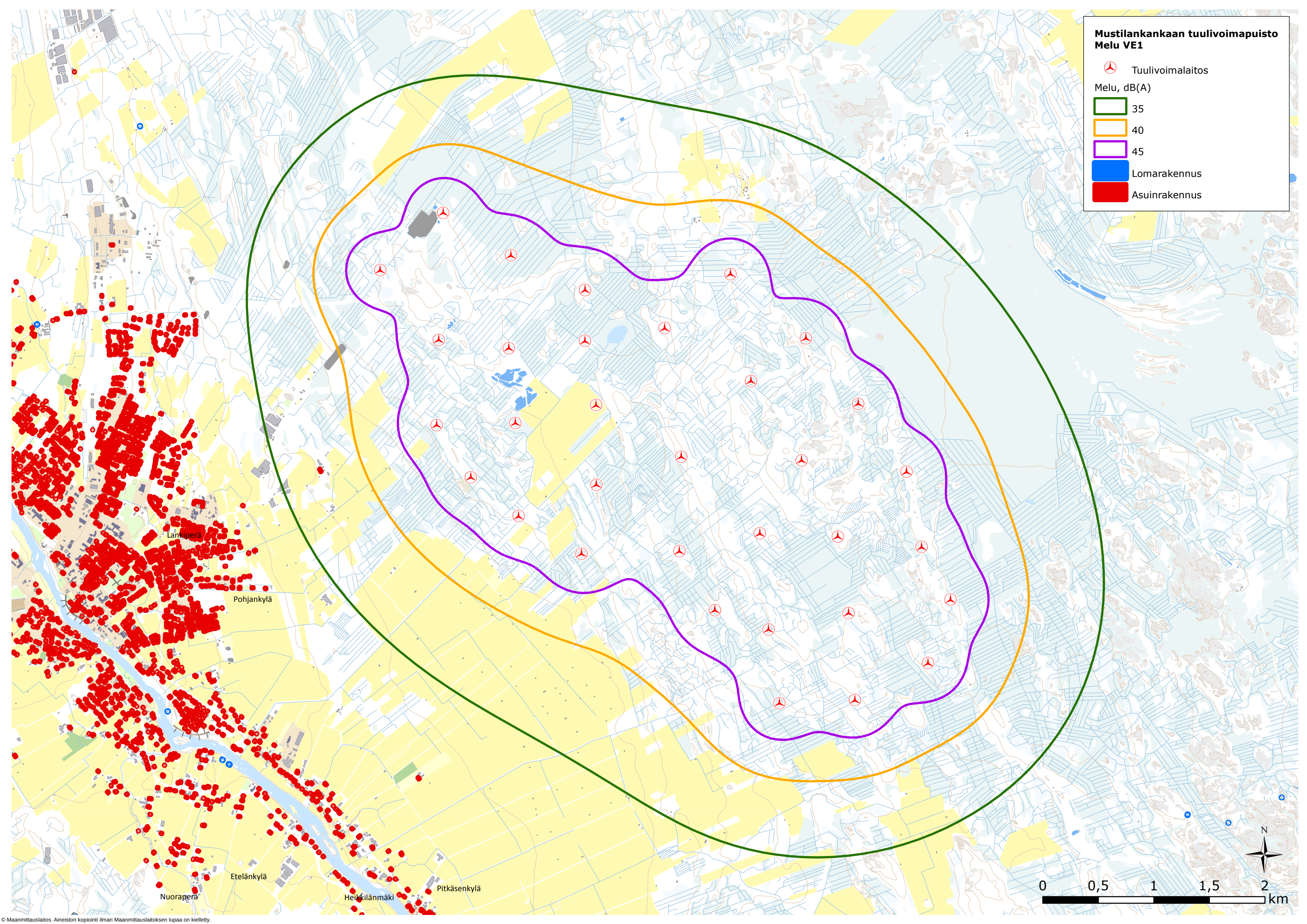


**Mustilankankaan tuulivoimapuisto
Melu VE1**

-  Tuulivoimalaitos
- Melu, dB(A)
-  35
-  40
-  45
-  Lomarakennus
-  Asuinrakennus



Mustilankankaan tuulivoimapuisto
Melu VE2

 Tuulivoimalaitos

Melu, dB(A)

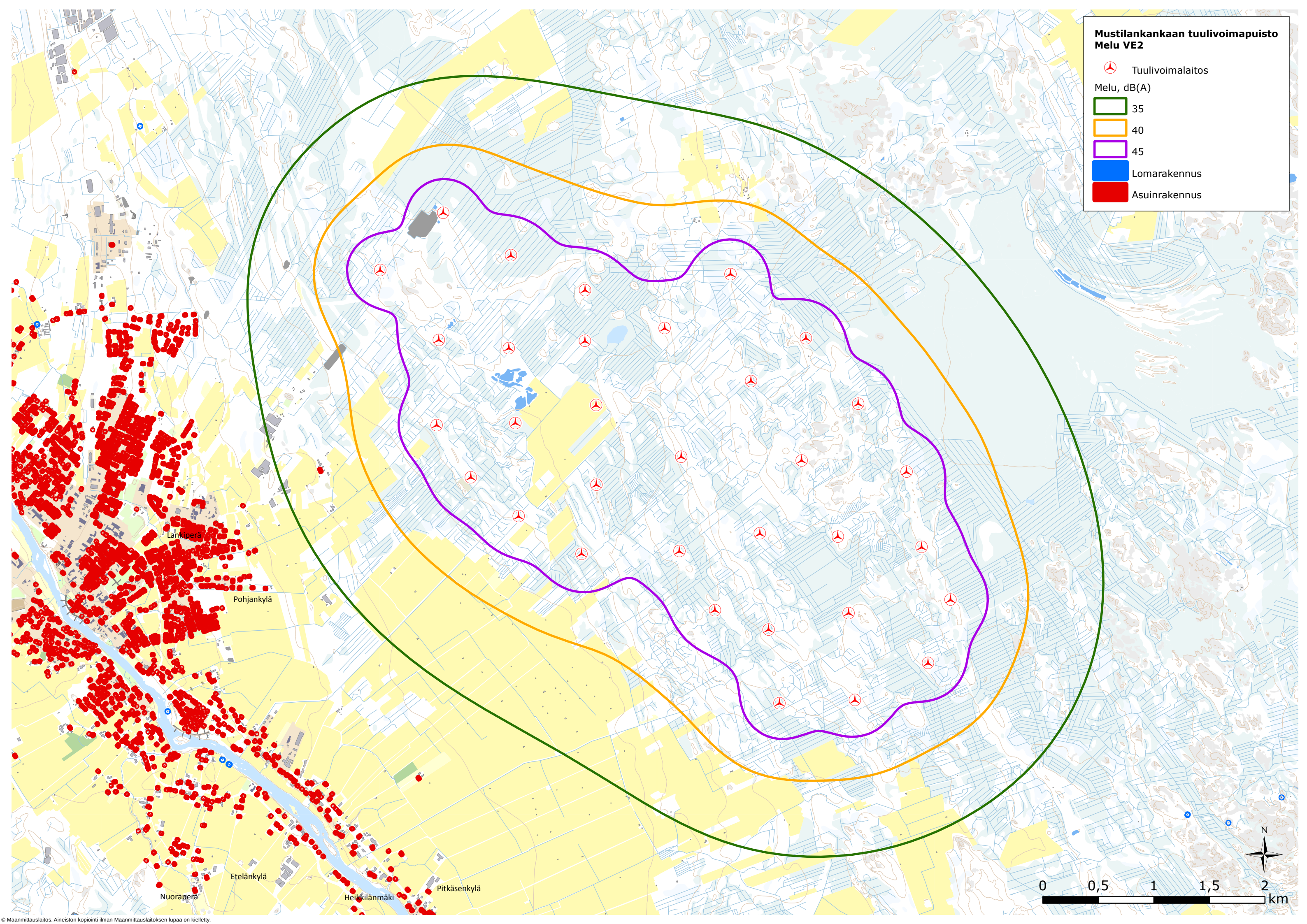
 35

 40

 45

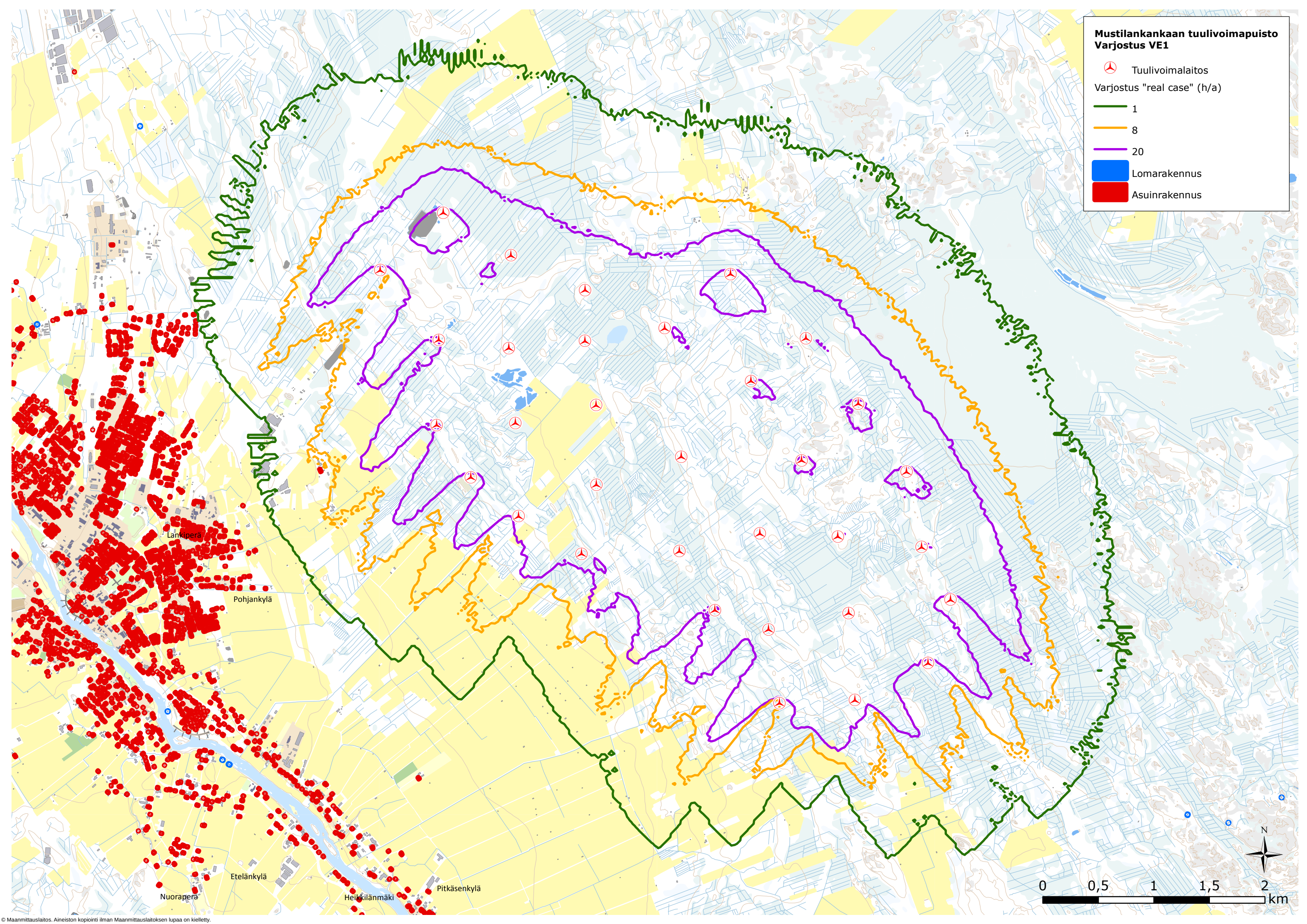
 Lomarakennus

 Asuinrakennus



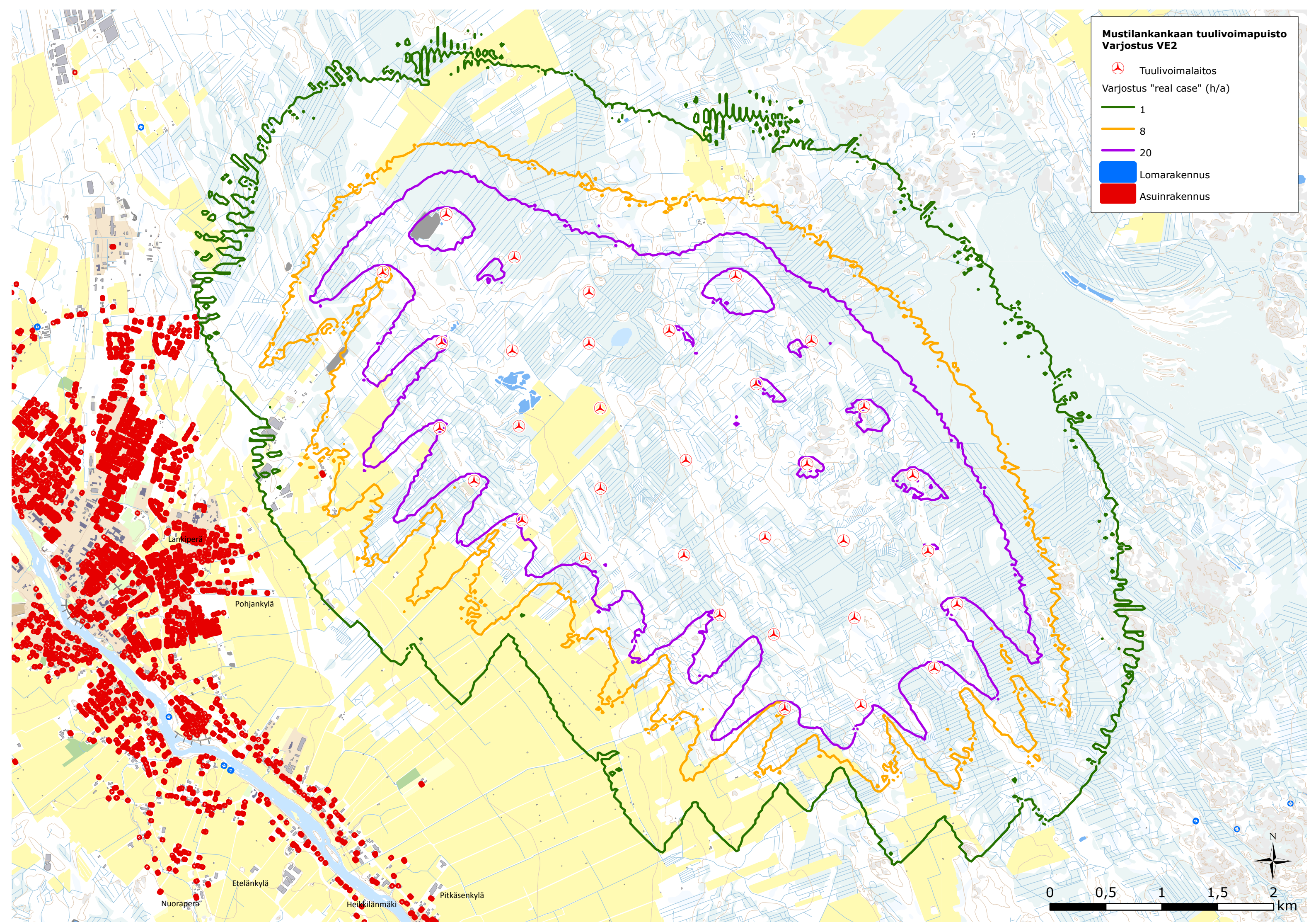
**Mustilankankaan tuulivoimapuisto
Varjostus VE1**

-  Tuulivoimalaitos
- Varjostus "real case" (h/a)
-  1
-  8
-  20
-  Lomarakennus
-  Asuinrakennus



**Mustilankankaan tuulivoimapuisto
Varjostus VE2**

-  Tuulivoimalaitos
- Varjostus "real case" (h/a)
-  1
-  8
-  20
-  Lomarakennus
-  Asuinrakennus



Project:

Kalajoki yhteisvaikutukset

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Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Hans Vadback / hans.vadback@fcg.fi

Calculated:

30.4.2012 11:19/2.7.487

SHADOW - Main Result**Calculation:** Kalajoki TuuliWatti V112 x 33 x HH119**Assumptions for shadow calculations**

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence

3 °

Day step for calculation

1 days

Time step for calculation

1 minutes

Sunshine probability S (Average daily sunshine hours) [LULEA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,60	2,61	4,18	6,47	8,80	10,60	9,50	6,88	4,22	2,77	1,22	0,17

Operational hours are calculated from WTGs in calculation and wind distribution:

ULKOKALLA_(AUT)_SYNOP_02-907_N64.330_E23.600

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
877	667	477	468	565	719	1090	1279	871	541	457	532	8544

Idle start wind speed: Cut in wind speed from power curve

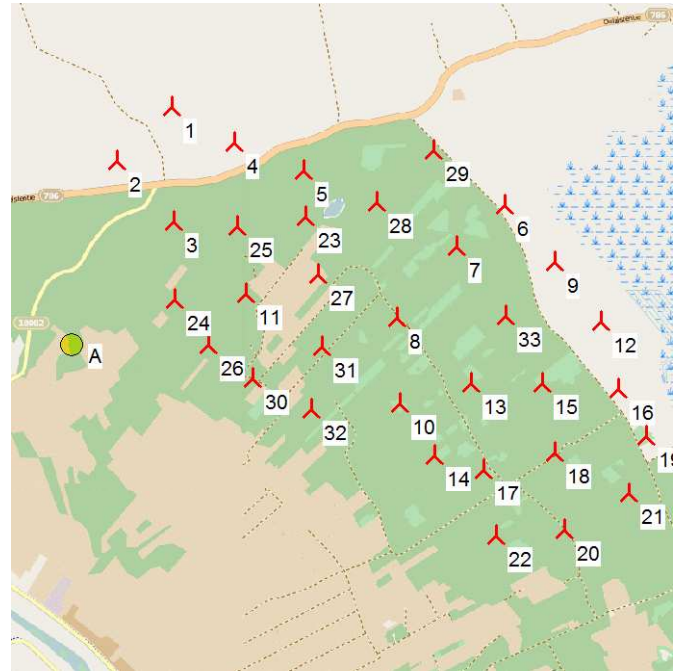
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Height Contours: Kalajoki korkeuskäyrä.wpo (1)

Obstacles not used in calculation

Eye height: 1,5 m

Grid resolution: 10 m



Scale 1:75 000

New WTG

Shadow receptor

WTGs

KKJ Zone: 3

East

North

Z

Row data/Description

WTG type

Valid

Manufact.

Type-generator

Power,

rated

[kW]

Rotor

diameter

[m]

Hub

height

[m]

Shadow data

Calculation

distance

[m]

RPM

[RPM]

KKJ Zone: 3			[m]									
East	North	Z	Row data/Description		Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [RPM]
1	3 355 577	7 135 421	30,0	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
2	3 355 009	7 134 905	31,7	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
3	3 355 537	7 134 277	31,2	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
4	3 356 186	7 135 037	30,0	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
5	3 356 854	7 134 725	30,0	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
6	3 358 842	7 134 292	45,0	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
7	3 358 347	7 133 906	43,7	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
8	3 357 719	7 133 223	36,2	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
9	3 359 312	7 133 703	47,3	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
10	3 357 702	7 132 375	33,3	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
11	3 356 226	7 133 528	27,5	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
12	3 359 747	7 133 090	49,5	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
13	3 358 427	7 132 534	42,5	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
14	3 358 023	7 131 842	35,2	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
15	3 359 129	7 132 505	42,5	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
16	3 359 882	7 132 412	47,5	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
17	3 358 505	7 131 669	39,0	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
18	3 359 226	7 131 816	42,5	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
19	3 360 143	7 131 937	37,5	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
20	3 359 282	7 131 034	39,3	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
21	3 359 940	7 131 367	45,0	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
22	3 358 603	7 131 007	34,8	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
23	3 356 852	7 134 267	30,0	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
24	3 355 518	7 133 511	25,6	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
25	3 356 167	7 134 203	30,0	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
26	3 355 824	7 133 040	25,6	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
27	3 356 953	7 133 689	29,4	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
28	3 357 570	7 134 382	34,2	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
29	3 358 162	7 134 870	39,7	VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8

To be continued on next page...

Project:

Kalajoki yhteisvaikutukset

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Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Hans Vadbäck / hans.vadback@fcg.fi

Calculated:

30.4.2012 11:19/2.7.487

SHADOW - Main Result**Calculation:** Kalajoki TuuliWatti V112 x 33 x HH119

...continued from previous page

KKJ Zone: 3				WTG type			Shadow data				
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
							[kW]	[m]	[m]	[m]	[RPM]
KKJ Zone: 3			[m]								
30	3 356 255	7 132 689	25,1 VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
31	3 356 956	7 132 972	30,0 VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
32	3 356 822	7 132 350	26,9 VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8
33	3 358 802	7 133 191	46,3 VESTAS V112 3000 112.0 !O!...	Yes	VESTAS	V112-3 000	3 000	112,0	119,0	1 709	12,8

Shadow receptor-Input

KKJ Zone: 3										
No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
A	asuinrakennus	3 354 472	7 133 102	20,3	1,0	1,0	1,0	-180,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

		Shadow, expected values
No.	Name	Shadow hours per year
		[h/year]
A	asuinrakennus	7:24

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case	Expected
		[h/year]	[h/year]
1	VESTAS V112 3000 112.0 !O! hub: 119,0 m (97)	0:00	0:00
2	VESTAS V112 3000 112.0 !O! hub: 119,0 m (98)	0:00	0:00
3	VESTAS V112 3000 112.0 !O! hub: 119,0 m (99)	9:11	2:59
4	VESTAS V112 3000 112.0 !O! hub: 119,0 m (100)	0:00	0:00
5	VESTAS V112 3000 112.0 !O! hub: 119,0 m (101)	0:00	0:00
6	VESTAS V112 3000 112.0 !O! hub: 119,0 m (102)	0:00	0:00
7	VESTAS V112 3000 112.0 !O! hub: 119,0 m (103)	0:00	0:00
8	VESTAS V112 3000 112.0 !O! hub: 119,0 m (104)	0:00	0:00
9	VESTAS V112 3000 112.0 !O! hub: 119,0 m (105)	0:00	0:00
10	VESTAS V112 3000 112.0 !O! hub: 119,0 m (106)	0:00	0:00
11	VESTAS V112 3000 112.0 !O! hub: 119,0 m (107)	0:00	0:00
12	VESTAS V112 3000 112.0 !O! hub: 119,0 m (108)	0:00	0:00
13	VESTAS V112 3000 112.0 !O! hub: 119,0 m (109)	0:00	0:00
14	VESTAS V112 3000 112.0 !O! hub: 119,0 m (110)	0:00	0:00
15	VESTAS V112 3000 112.0 !O! hub: 119,0 m (111)	0:00	0:00
16	VESTAS V112 3000 112.0 !O! hub: 119,0 m (112)	0:00	0:00
17	VESTAS V112 3000 112.0 !O! hub: 119,0 m (113)	0:00	0:00
18	VESTAS V112 3000 112.0 !O! hub: 119,0 m (114)	0:00	0:00
19	VESTAS V112 3000 112.0 !O! hub: 119,0 m (115)	0:00	0:00
20	VESTAS V112 3000 112.0 !O! hub: 119,0 m (116)	0:00	0:00
21	VESTAS V112 3000 112.0 !O! hub: 119,0 m (117)	0:00	0:00
22	VESTAS V112 3000 112.0 !O! hub: 119,0 m (118)	0:00	0:00
23	VESTAS V112 3000 112.0 !O! hub: 119,0 m (119)	0:00	0:00
24	VESTAS V112 3000 112.0 !O! hub: 119,0 m (120)	12:32	3:14
25	VESTAS V112 3000 112.0 !O! hub: 119,0 m (121)	0:00	0:00
26	VESTAS V112 3000 112.0 !O! hub: 119,0 m (122)	6:07	1:12
27	VESTAS V112 3000 112.0 !O! hub: 119,0 m (123)	0:00	0:00
28	VESTAS V112 3000 112.0 !O! hub: 119,0 m (124)	0:00	0:00
29	VESTAS V112 3000 112.0 !O! hub: 119,0 m (125)	0:00	0:00
30	VESTAS V112 3000 112.0 !O! hub: 119,0 m (126)	0:00	0:00
31	VESTAS V112 3000 112.0 !O! hub: 119,0 m (127)	0:00	0:00
32	VESTAS V112 3000 112.0 !O! hub: 119,0 m (128)	0:00	0:00
33	VESTAS V112 3000 112.0 !O! hub: 119,0 m (129)	0:00	0:00

Project:

Kalajoki yhteisvaikutukset

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Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Hans Vadbäck / hans.vadbäck@fcg.fi

Calculated:

30.4.2012 11:37/2.7.487

SHADOW - Main Result**Calculation:** Kalajoki TuuliWatti V112 x 33 x HH140**Assumptions for shadow calculations**

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence

3 °

Day step for calculation

1 days

Time step for calculation

1 minutes

Sunshine probability S (Average daily sunshine hours) [LULEA]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,60	2,61	4,18	6,47	8,80	10,60	9,50	6,88	4,22	2,77	1,22	0,17

Operational hours are calculated from WTGs in calculation and wind distribution:

ULKOKALLA_(AUT)_SYNOP_02-907_N64.330_E23.600

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
872	663	475	466	562	715	1084	1272	867	538	454	529	8498

Idle start wind speed: Cut in wind speed from power curve

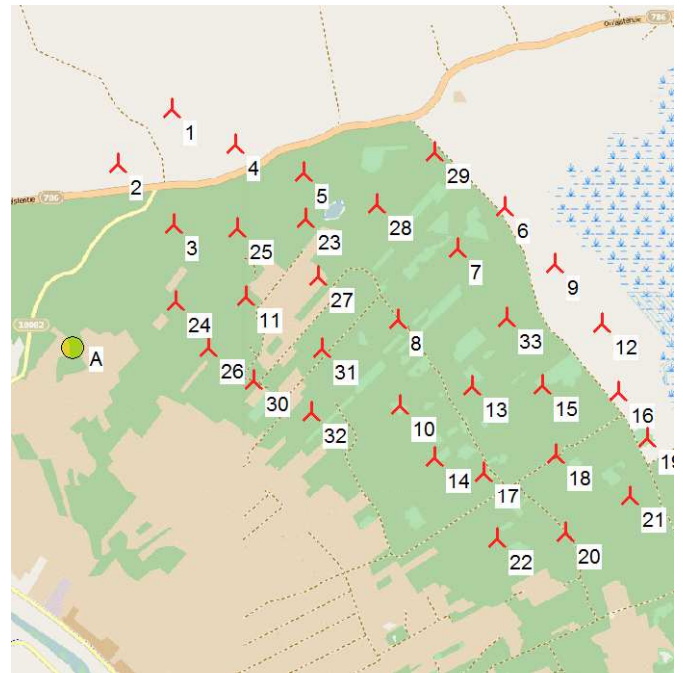
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Height Contours: Kalajoki korkeuskäyrä.wpo (1)

Obstacles not used in calculation

Eye height: 1,5 m

Grid resolution: 10 m



New WTG

Scale 1:75 000

Shadow receptor

WTGs

KKJ Zone: 3				WTG type			Shadow data				
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM
KKJ Zone: 3											
1	3 355 577	7 135 421	30,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
2	3 355 009	7 134 905	31,7 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
3	3 355 537	7 134 277	31,2 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
4	3 356 186	7 135 037	30,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
5	3 356 854	7 134 725	30,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
6	3 358 842	7 134 292	45,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
7	3 358 347	7 133 906	43,7 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
8	3 357 719	7 133 223	36,2 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
9	3 359 312	7 133 703	47,3 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
10	3 357 702	7 132 375	33,3 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
11	3 356 226	7 133 528	27,5 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
12	3 359 747	7 133 090	49,5 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
13	3 358 427	7 132 534	42,5 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
14	3 358 023	7 131 842	35,2 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
15	3 359 129	7 132 505	42,5 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
16	3 359 882	7 132 412	47,5 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
17	3 358 505	7 131 669	39,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
18	3 359 226	7 131 816	42,5 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
19	3 360 143	7 131 937	47,5 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
20	3 359 282	7 131 034	39,3 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
21	3 359 940	7 131 367	45,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
22	3 358 603	7 131 007	34,8 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
23	3 356 852	7 134 267	30,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
24	3 355 518	7 133 511	25,6 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
25	3 356 167	7 134 203	30,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
26	3 355 824	7 133 040	25,6 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
27	3 356 953	7 133 689	29,4 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
28	3 357 570	7 134 382	34,2 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
29	3 358 162	7 134 870	39,7 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8

To be continued on next page...

Project:

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Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Hans Vadbäck / hans.vadback@fcg.fi

Calculated:

30.4.2012 11:37/2.7.487

SHADOW - Main Result**Calculation:** Kalajoki TuuliWatti V112 x 33 x HH140

...continued from previous page

KKJ Zone: 3				WTG type				Shadow data			
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM
KKJ Zone: 3			[m]								
30	3 356 255	7 132 689	25,1 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
31	3 356 956	7 132 972	30,0 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
32	3 356 822	7 132 350	26,9 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8
33	3 358 802	7 133 191	46,3 VESTAS V112 3000 112.0 !O! ... Yes	Yes	VESTAS	V112-3 000	3 000	112,0	140,0	1 708	12,8

Shadow receptor-Input

KKJ Zone: 3										
No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
	A asuinrakennus	3 354 472	7 133 102	20,3	1,0	1,0	1,0	-180,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

Shadow, expected values

No.	Name	Shadow hours per year [h/year]
	A asuinrakennus	6:31

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V112 3000 112.0 !O! hub: 140,0 m (1)	0:00	0:00
2	VESTAS V112 3000 112.0 !O! hub: 140,0 m (7)	0:00	0:00
3	VESTAS V112 3000 112.0 !O! hub: 140,0 m (8)	5:33	1:48
4	VESTAS V112 3000 112.0 !O! hub: 140,0 m (9)	0:00	0:00
5	VESTAS V112 3000 112.0 !O! hub: 140,0 m (10)	0:00	0:00
6	VESTAS V112 3000 112.0 !O! hub: 140,0 m (11)	0:00	0:00
7	VESTAS V112 3000 112.0 !O! hub: 140,0 m (12)	0:00	0:00
8	VESTAS V112 3000 112.0 !O! hub: 140,0 m (13)	0:00	0:00
9	VESTAS V112 3000 112.0 !O! hub: 140,0 m (14)	0:00	0:00
10	VESTAS V112 3000 112.0 !O! hub: 140,0 m (15)	0:00	0:00
11	VESTAS V112 3000 112.0 !O! hub: 140,0 m (16)	0:00	0:00
12	VESTAS V112 3000 112.0 !O! hub: 140,0 m (17)	0:00	0:00
13	VESTAS V112 3000 112.0 !O! hub: 140,0 m (18)	0:00	0:00
14	VESTAS V112 3000 112.0 !O! hub: 140,0 m (19)	0:00	0:00
15	VESTAS V112 3000 112.0 !O! hub: 140,0 m (20)	0:00	0:00
16	VESTAS V112 3000 112.0 !O! hub: 140,0 m (21)	0:00	0:00
17	VESTAS V112 3000 112.0 !O! hub: 140,0 m (22)	0:00	0:00
18	VESTAS V112 3000 112.0 !O! hub: 140,0 m (23)	0:00	0:00
19	VESTAS V112 3000 112.0 !O! hub: 140,0 m (24)	0:00	0:00
20	VESTAS V112 3000 112.0 !O! hub: 140,0 m (25)	0:00	0:00
21	VESTAS V112 3000 112.0 !O! hub: 140,0 m (26)	0:00	0:00
22	VESTAS V112 3000 112.0 !O! hub: 140,0 m (27)	0:00	0:00
23	VESTAS V112 3000 112.0 !O! hub: 140,0 m (28)	0:00	0:00
24	VESTAS V112 3000 112.0 !O! hub: 140,0 m (29)	13:16	3:29
25	VESTAS V112 3000 112.0 !O! hub: 140,0 m (30)	0:00	0:00
26	VESTAS V112 3000 112.0 !O! hub: 140,0 m (31)	6:12	1:14
27	VESTAS V112 3000 112.0 !O! hub: 140,0 m (32)	0:00	0:00
28	VESTAS V112 3000 112.0 !O! hub: 140,0 m (33)	0:00	0:00
29	VESTAS V112 3000 112.0 !O! hub: 140,0 m (34)	0:00	0:00
30	VESTAS V112 3000 112.0 !O! hub: 140,0 m (35)	0:00	0:00
31	VESTAS V112 3000 112.0 !O! hub: 140,0 m (36)	0:00	0:00
32	VESTAS V112 3000 112.0 !O! hub: 140,0 m (37)	0:00	0:00
33	VESTAS V112 3000 112.0 !O! hub: 140,0 m (38)	0:00	0:00