

Project:

20240527\_Clare4n\_Revised\_SF\_Assessment

Licensed user:

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Calculated:

07/07/2025 11:43/4.0.424

## SHADOW - Main Result

**Calculation:** Worst Case

### Assumptions for shadow calculations

|                                               |           |
|-----------------------------------------------|-----------|
| Maximum distance for influence                | 2,000 m   |
| 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) []

| Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 1.70 | 2.40 | 3.60 | 5.40 | 5.90 | 5.50 | 4.40 | 4.60 | 3.90 | 3.00 | 2.10 | 1.50 |

Operational time

| N   | NNE | NE  | ENE | E   | ESE | SE  | SSE | S   | SSW | SW  | WSW   |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 161 | 214 | 282 | 397 | 231 | 346 | 817 | 639 | 450 | 567 | 872 | 1,114 |

| W   | WNW | NW  | NNW | Sum   |
|-----|-----|-----|-----|-------|
| 793 | 818 | 765 | 294 | 8,760 |

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: CONTOURLINE\_20240527\_Clare4n\_R  
Receptor grid resolution: 1.0 m

All coordinates are in

Irish ITM-IRENET95 (IE), geocentric, GRS80

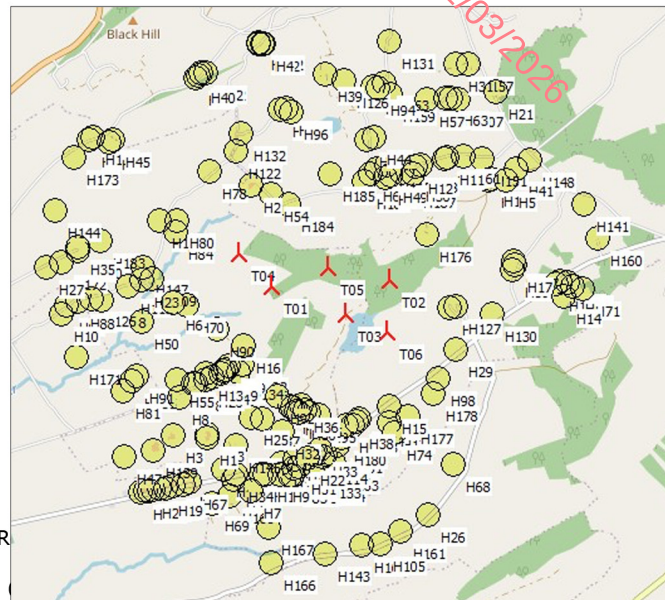
### WTGs

|   | Easting | Northing | Z     | Row data/Description | WTG type |           |                |              | Shadow data    |            |                      |       |
|---|---------|----------|-------|----------------------|----------|-----------|----------------|--------------|----------------|------------|----------------------|-------|
|   |         |          |       |                      | Valid    | Manufact. | Type-generator | Power, rated | Rotor diameter | Hub height | Calculation distance | RPM   |
|   |         |          | [m]   |                      |          |           |                | [kW]         | [m]            | [m]        | [m]                  | [RPM] |
| 1 | 510,310 | 681,176  | 190.0 | T06                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 2 | 510,339 | 681,648  | 183.1 | T02                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 3 | 509,923 | 681,348  | 189.1 | T03                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 4 | 509,773 | 681,776  | 171.7 | T05                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 5 | 509,248 | 681,617  | 160.0 | T01                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 6 | 508,957 | 681,920  | 135.4 | T04                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |

### Shadow receptor-Input

| No. | Name | Easting | Northing | Z     | Width | Height | Elevation a.g.l. | Slope of window | Direction mode     | Eye height (ZVI) a.g.l. |
|-----|------|---------|----------|-------|-------|--------|------------------|-----------------|--------------------|-------------------------|
|     |      |         |          | [m]   | [m]   | [m]    | [m]              | [°]             |                    | [m]                     |
| A   | H1   | 508,632 | 680,244  | 143.8 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| B   | H2   | 509,084 | 682,541  | 141.5 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| C   | H3   | 508,326 | 680,267  | 150.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| D   | H4   | 509,228 | 683,830  | 110.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| E   | H5   | 511,430 | 682,538  | 104.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| F   | H6   | 508,351 | 681,477  | 105.8 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| G   | H7   | 509,026 | 679,746  | 145.4 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| H   | H8   | 508,393 | 680,615  | 132.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| I   | H9   | 509,301 | 679,892  | 160.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| J   | H10  | 507,319 | 681,392  | 88.3  | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| K   | H11  | 510,885 | 682,752  | 130.1 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| L   | H12  | 510,603 | 682,685  | 160.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| M   | H13  | 508,632 | 680,825  | 146.3 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| N   | H14  | 511,947 | 681,473  | 132.5 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| O   | H15  | 510,316 | 680,500  | 178.4 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| P   | H16  | 508,983 | 681,075  | 160.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| Q   | H17  | 511,498 | 681,770  | 125.9 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| R   | H18  | 509,161 | 679,898  | 155.5 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| S   | H19  | 508,247 | 679,785  | 130.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| T   | H20  | 508,630 | 680,768  | 147.6 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| U   | H21  | 511,347 | 683,347  | 84.4  | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| V   | H22  | 509,557 | 680,037  | 170.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| W   | H23  | 508,064 | 681,690  | 100.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| X   | H24  | 508,698 | 680,796  | 154.6 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |

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## SHADOW - Main Result

Calculation: Worst Case

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| No.    | Name | Easting | Northing | Z     | Width | Height | Elevation<br>a.g.l. | Slope of<br>window | Direction mode     | Eye height<br>(ZVI) a.g.l. |
|--------|------|---------|----------|-------|-------|--------|---------------------|--------------------|--------------------|----------------------------|
|        |      |         |          | [m]   | [m]   | [m]    | [m]                 | [°]                |                    | [m]                        |
| Y H25  |      | 509,041 | 680,417  | 169.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| Z H26  |      | 510,655 | 679,499  | 141.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AA H27 |      | 507,190 | 681,828  | 86.0  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AB H28 |      | 508,096 | 679,765  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AC H29 |      | 510,938 | 681,006  | 154.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AD H30 |      | 510,580 | 682,615  | 154.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AE H31 |      | 510,987 | 683,607  | 82.6  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AF H32 |      | 509,325 | 680,288  | 161.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AG H33 |      | 509,678 | 680,112  | 170.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AH H34 |      | 508,896 | 679,897  | 139.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AI H35 |      | 507,475 | 682,004  | 104.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AJ H36 |      | 509,504 | 680,520  | 183.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AK H37 |      | 509,153 | 680,404  | 171.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AL H38 |      | 510,014 | 680,366  | 176.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AM H39 |      | 509,784 | 683,537  | 107.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AN H40 |      | 508,618 | 683,551  | 127.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AO H41 |      | 511,520 | 682,641  | 98.7  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AP H42 |      | 508,686 | 683,575  | 128.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AQ H43 |      | 508,634 | 680,271  | 146.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AR H44 |      | 510,219 | 682,951  | 152.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AS H45 |      | 507,816 | 682,980  | 118.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AT H46 |      | 508,877 | 679,851  | 139.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AU H47 |      | 507,866 | 680,083  | 126.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AV H48 |      | 508,781 | 679,942  | 131.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AW H49 |      | 510,371 | 682,606  | 180.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AX H50 |      | 508,051 | 681,312  | 92.4  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AY H51 |      | 509,478 | 679,960  | 167.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AZ H52 |      | 509,478 | 679,960  | 167.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BA H53 |      | 510,325 | 682,586  | 180.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BB H54 |      | 509,264 | 682,451  | 150.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BC H55 |      | 508,372 | 680,777  | 113.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BD H56 |      | 508,372 | 680,777  | 113.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BE H57 |      | 510,719 | 683,290  | 103.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BF H58 |      | 510,644 | 682,692  | 155.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BG H59 |      | 511,473 | 681,721  | 127.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BH H60 |      | 509,485 | 680,450  | 179.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BI H61 |      | 511,046 | 682,767  | 118.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BJ H62 |      | 508,186 | 679,783  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BK H63 |      | 510,930 | 683,299  | 99.1  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BL H64 |      | 510,863 | 682,745  | 132.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BM H65 |      | 510,182 | 682,625  | 180.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BN H66 |      | 509,917 | 680,334  | 175.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BO H67 |      | 508,464 | 679,839  | 131.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BP H68 |      | 510,900 | 679,953  | 161.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BQ H69 |      | 508,667 | 679,635  | 124.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BR H70 |      | 508,471 | 681,454  | 108.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BS H71 |      | 512,121 | 681,532  | 125.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BT H72 |      | 508,413 | 679,816  | 130.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BU H73 |      | 510,888 | 683,298  | 100.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BV H74 |      | 510,356 | 680,257  | 160.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BW H75 |      | 510,151 | 682,935  | 154.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BX H76 |      | 509,433 | 679,952  | 165.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BY H77 |      | 507,781 | 682,954  | 116.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BZ H78 |      | 508,706 | 682,667  | 140.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CA H79 |      | 508,775 | 680,828  | 161.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CB H80 |      | 508,394 | 682,223  | 140.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CC H81 |      | 507,872 | 680,682  | 103.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CD H82 |      | 509,212 | 683,830  | 110.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CE H83 |      | 509,391 | 679,883  | 161.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CF H84 |      | 508,383 | 682,127  | 129.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CG H85 |      | 509,541 | 680,471  | 181.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CH H86 |      | 508,797 | 680,846  | 163.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CI H87 |      | 508,516 | 680,741  | 133.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CJ H88 |      | 507,470 | 681,510  | 100.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |

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## SHADOW - Main Result

Calculation: Worst Case

...continued from previous page

| No.     | Name | Easting | Northing | Z     | Width | Height | Elevation<br>a.g.l. | Slope of<br>window | Direction mode     | Eye height<br>(ZVI) a.g.l. |
|---------|------|---------|----------|-------|-------|--------|---------------------|--------------------|--------------------|----------------------------|
|         |      |         |          | [m]   | [m]   | [m]    | [m]                 | [°]                |                    | [m]                        |
| CK H89  |      | 508,598 | 683,525  | 128.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CL H90  |      | 508,745 | 681,228  | 140.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CM H91  |      | 508,000 | 680,817  | 103.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CN H92  |      | 509,292 | 680,609  | 185.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CO H93  |      | 512,018 | 681,562  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CP H94  |      | 510,269 | 683,405  | 111.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CQ H95  |      | 509,674 | 680,427  | 180.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CR H96  |      | 509,467 | 683,200  | 150.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CS H97  |      | 507,364 | 681,478  | 99.1  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CT H98  |      | 510,770 | 680,743  | 168.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CU H99  |      | 508,850 | 680,887  | 163.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CV H100 |      | 509,423 | 683,234  | 149.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CW H101 |      | 510,467 | 682,626  | 172.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CX H102 |      | 509,182 | 683,842  | 112.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CY H103 |      | 508,542 | 680,735  | 137.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CZ H104 |      | 509,459 | 680,471  | 180.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DA H105 |      | 510,216 | 679,245  | 112.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DB H106 |      | 509,446 | 680,029  | 168.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DC H107 |      | 511,000 | 683,279  | 95.8  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DD H108 |      | 508,132 | 679,771  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DE H109 |      | 508,150 | 681,697  | 100.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DF H110 |      | 511,290 | 682,552  | 106.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DG H111 |      | 509,362 | 683,220  | 146.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DH H112 |      | 507,936 | 681,631  | 100.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DI H113 |      | 509,980 | 680,331  | 173.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DJ H114 |      | 509,696 | 680,051  | 168.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DK H115 |      | 510,330 | 682,700  | 175.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DL H116 |      | 511,879 | 681,582  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DM H117 |      | 510,247 | 682,661  | 174.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DN H118 |      | 509,572 | 680,455  | 180.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DO H119 |      | 509,615 | 680,069  | 170.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DP H120 |      | 511,977 | 681,591  | 131.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DQ H121 |      | 508,314 | 679,808  | 130.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DR H122 |      | 508,946 | 682,856  | 140.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DS H123 |      | 509,173 | 683,830  | 113.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DT H124 |      | 509,427 | 680,496  | 180.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DU H125 |      | 507,593 | 681,531  | 98.5  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DV H126 |      | 509,955 | 683,474  | 112.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DW H127 |      | 510,947 | 681,400  | 156.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DX H128 |      | 509,724 | 680,070  | 168.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DY H129 |      | 510,885 | 681,380  | 169.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DZ H130 |      | 511,286 | 681,320  | 137.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EA H131 |      | 510,375 | 683,825  | 82.7  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EB H132 |      | 508,999 | 683,013  | 136.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EC H133 |      | 509,631 | 679,917  | 163.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| ED H134 |      | 508,932 | 680,836  | 171.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EE H135 |      | 508,819 | 680,864  | 164.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EF H136 |      | 509,131 | 679,893  | 154.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EG H137 |      | 511,486 | 681,803  | 126.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EH H138 |      | 511,271 | 682,545  | 108.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EI H139 |      | 508,139 | 680,139  | 138.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EJ H140 |      | 508,139 | 680,139  | 138.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EK H141 |      | 512,144 | 682,310  | 110.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EL H142 |      | 511,914 | 681,606  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EM H143 |      | 509,704 | 679,161  | 100.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EN H144 |      | 507,277 | 682,339  | 118.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EO H145 |      | 508,895 | 680,171  | 143.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EP H146 |      | 509,418 | 679,874  | 161.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EQ H147 |      | 508,080 | 681,801  | 107.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| ER H148 |      | 511,655 | 682,715  | 92.3  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| ES H149 |      | 509,403 | 680,517  | 181.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| ET H150 |      | 507,478 | 681,972  | 101.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EU H151 |      | 511,216 | 682,745  | 105.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EV H152 |      | 508,637 | 683,574  | 126.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |

To be continued on next page...

## SHADOW - Main Result

Calculation: Worst Case

...continued from previous page

| No.     | Name | Easting | Northing | Z     | Width | Height | Elevation<br>a.g.l. | Slope of<br>window | Direction mode     | Eye height<br>(ZVI) a.g.l. |
|---------|------|---------|----------|-------|-------|--------|---------------------|--------------------|--------------------|----------------------------|
|         |      |         |          | [m]   | [m]   | [m]    | [m]                 | [°]                |                    | [m]                        |
| EW H153 |      | 510,328 | 683,452  | 106.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EX H154 |      | 510,037 | 680,382  | 176.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EY H155 |      | 507,953 | 680,772  | 103.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EZ H156 |      | 508,239 | 682,230  | 135.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FA H157 |      | 511,101 | 683,605  | 80.7  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FB H158 |      | 510,219 | 683,412  | 112.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FC H159 |      | 510,383 | 683,344  | 110.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FD H160 |      | 512,261 | 681,992  | 105.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FE H161 |      | 510,402 | 679,351  | 127.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FF H162 |      | 510,038 | 679,233  | 110.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FG H163 |      | 509,802 | 679,984  | 160.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FH H164 |      | 509,665 | 679,887  | 160.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FI H165 |      | 509,312 | 679,994  | 161.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FJ H166 |      | 509,198 | 679,090  | 92.9  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FK H167 |      | 509,187 | 679,412  | 110.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FL H168 |      | 508,833 | 679,702  | 133.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FM H169 |      | 508,012 | 679,751  | 128.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FN H170 |      | 508,060 | 679,761  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FO H171 |      | 507,450 | 681,004  | 90.0  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FP H172 |      | 507,325 | 681,872  | 91.7  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FQ H173 |      | 507,461 | 682,818  | 117.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FR H174 |      | 507,631 | 683,005  | 111.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FS H175 |      | 507,605 | 682,985  | 112.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FT H176 |      | 510,696 | 682,054  | 150.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FU H177 |      | 510,483 | 680,398  | 170.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FV H178 |      | 510,729 | 680,609  | 163.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FW H179 |      | 510,315 | 680,348  | 168.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FX H180 |      | 509,874 | 680,216  | 168.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FY H181 |      | 509,831 | 680,151  | 167.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FZ H182 |      | 508,969 | 680,902  | 168.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GA H183 |      | 507,690 | 682,061  | 109.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GB H184 |      | 509,429 | 682,352  | 167.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GC H185 |      | 509,819 | 682,632  | 178.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GD H186 |      | 510,126 | 682,551  | 178.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GE H187 |      | 510,546 | 682,559  | 150.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GF H188 |      | 507,686 | 681,509  | 93.2  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |

## Calculation Results

Shadow receptor

| No.   | Name | Shadow, worst case   |                         |                          | Shadow, expected values |  |
|-------|------|----------------------|-------------------------|--------------------------|-------------------------|--|
|       |      | Shadow hours         | Shadow days             | Max shadow               | Shadow hours            |  |
|       |      | per year<br>[h/year] | per year<br>[days/year] | hours per day<br>[h/day] | per year<br>[h/year]    |  |
| A H1  |      | 7:33                 | 43                      | 0:15                     | 1:35                    |  |
| B H2  |      | 47:03                | 106                     | 0:38                     | 6:12                    |  |
| C H3  |      | 6:21                 | 40                      | 0:13                     | 1:18                    |  |
| D H4  |      | 0:00                 | 0                       | 0:00                     | 0:00                    |  |
| E H5  |      | 27:34                | 109                     | 0:24                     | 3:55                    |  |
| F H6  |      | 34:45                | 102                     | 0:42                     | 8:12                    |  |
| G H7  |      | 0:00                 | 0                       | 0:00                     | 0:00                    |  |
| H H8  |      | 12:21                | 60                      | 0:17                     | 2:47                    |  |
| I H9  |      | 0:00                 | 0                       | 0:00                     | 0:00                    |  |
| J H10 |      | 9:01                 | 46                      | 0:17                     | 2:10                    |  |
| K H11 |      | 13:01                | 50                      | 0:23                     | 1:53                    |  |
| L H12 |      | 24:55                | 78                      | 0:24                     | 3:15                    |  |
| M H13 |      | 20:21                | 66                      | 0:34                     | 4:39                    |  |
| N H14 |      | 9:26                 | 43                      | 0:17                     | 2:07                    |  |
| O H15 |      | 0:00                 | 0                       | 0:00                     | 0:00                    |  |
| P H16 |      | 33:50                | 85                      | 0:44                     | 7:59                    |  |
| Q H17 |      | 25:26                | 83                      | 0:37                     | 5:07                    |  |
| R H18 |      | 0:00                 | 0                       | 0:00                     | 0:00                    |  |
| S H19 |      | 0:00                 | 0                       | 0:00                     | 0:00                    |  |
| T H20 |      | 20:42                | 68                      | 0:32                     | 4:40                    |  |

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## SHADOW - Main Result

Calculation: Worst Case

...continued from previous page

| No. | Name | Shadow, worst case                   |                                        | Shadow, expected values                |                                      |
|-----|------|--------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|
|     |      | Shadow hours<br>per year<br>[h/year] | Shadow days<br>per year<br>[days/year] | Max shadow<br>hours per day<br>[h/day] | Shadow hours<br>per year<br>[h/year] |
| U   | H21  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| V   | H22  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| W   | H23  | 37:00                                | 107                                    | 0:34                                   | 8:39                                 |
| X   | H24  | 22:21                                | 72                                     | 0:33                                   | 5:02                                 |
| Y   | H25  | 16:47                                | 63                                     | 0:20                                   | 3:29                                 |
| Z   | H26  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AA  | H27  | 3:58                                 | 22                                     | 0:16                                   | 0:57                                 |
| AB  | H28  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AC  | H29  | 73:05                                | 122                                    | 0:57                                   | 16:11                                |
| AD  | H30  | 29:30                                | 98                                     | 0:26                                   | 4:01                                 |
| AE  | H31  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AF  | H32  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AG  | H33  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AH  | H34  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AI  | H35  | 8:56                                 | 44                                     | 0:18                                   | 1:52                                 |
| AJ  | H36  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AK  | H37  | 10:27                                | 46                                     | 0:19                                   | 2:09                                 |
| AL  | H38  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AM  | H39  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AN  | H40  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AO  | H41  | 22:16                                | 100                                    | 0:18                                   | 3:08                                 |
| AP  | H42  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AQ  | H43  | 6:49                                 | 39                                     | 0:16                                   | 1:27                                 |
| AR  | H44  | 3:04                                 | 24                                     | 0:13                                   | 0:26                                 |
| AS  | H45  | 7:50                                 | 40                                     | 0:19                                   | 1:05                                 |
| AT  | H46  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AU  | H47  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AV  | H48  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AW  | H49  | 16:13                                | 78                                     | 0:23                                   | 2:04                                 |
| AX  | H50  | 20:35                                | 82                                     | 0:26                                   | 4:49                                 |
| AY  | H51  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AZ  | H52  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BA  | H53  | 15:44                                | 76                                     | 0:22                                   | 2:01                                 |
| BB  | H54  | 84:43                                | 80                                     | 1:31                                   | 10:31                                |
| BC  | H55  | 8:16                                 | 45                                     | 0:18                                   | 1:54                                 |
| BD  | H56  | 8:16                                 | 45                                     | 0:18                                   | 1:54                                 |
| BE  | H57  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BF  | H58  | 25:12                                | 91                                     | 0:24                                   | 3:23                                 |
| BG  | H59  | 26:37                                | 84                                     | 0:39                                   | 5:29                                 |
| BH  | H60  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BI  | H61  | 23:51                                | 68                                     | 0:35                                   | 3:03                                 |
| BJ  | H62  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BK  | H63  | 3:22                                 | 22                                     | 0:11                                   | 0:24                                 |
| BL  | H64  | 13:32                                | 52                                     | 0:23                                   | 1:57                                 |
| BM  | H65  | 12:27                                | 58                                     | 0:19                                   | 1:36                                 |
| BN  | H66  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BO  | H67  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BP  | H68  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BQ  | H69  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BR  | H70  | 45:25                                | 121                                    | 0:43                                   | 10:37                                |
| BS  | H71  | 7:37                                 | 40                                     | 0:15                                   | 1:41                                 |
| BT  | H72  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BU  | H73  | 1:16                                 | 14                                     | 0:07                                   | 0:08                                 |
| BV  | H74  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BW  | H75  | 3:44                                 | 28                                     | 0:14                                   | 0:32                                 |
| BX  | H76  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BY  | H77  | 7:41                                 | 38                                     | 0:19                                   | 1:04                                 |
| BZ  | H78  | 24:32                                | 110                                    | 0:21                                   | 3:25                                 |
| CA  | H79  | 25:02                                | 78                                     | 0:34                                   | 5:37                                 |
| CB  | H80  | 50:12                                | 83                                     | 0:54                                   | 8:45                                 |
| CC  | H81  | 5:59                                 | 31                                     | 0:14                                   | 1:14                                 |
| CD  | H82  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CE  | H83  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |

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## SHADOW - Main Result

Calculation: Worst Case

...continued from previous page

| No. | Name | Shadow, worst case                   |                                        | Shadow, expected values                |                                      |
|-----|------|--------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|
|     |      | Shadow hours<br>per year<br>[h/year] | Shadow days<br>per year<br>[days/year] | Max shadow<br>hours per day<br>[h/day] | Shadow hours<br>per year<br>[h/year] |
| CF  | H84  | 55:29                                | 89                                     | 0:59                                   | 10:35                                |
| CG  | H85  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CH  | H86  | 25:19                                | 76                                     | 0:35                                   | 5:42                                 |
| CI  | H87  | 13:47                                | 61                                     | 0:19                                   | 3:10                                 |
| CJ  | H88  | 10:17                                | 48                                     | 0:19                                   | 2:29                                 |
| CK  | H89  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CL  | H90  | 47:13                                | 147                                    | 0:26                                   | 10:31                                |
| CM  | H91  | 14:07                                | 61                                     | 0:18                                   | 3:02                                 |
| CN  | H92  | 24:19                                | 75                                     | 0:25                                   | 5:06                                 |
| CO  | H93  | 8:28                                 | 42                                     | 0:17                                   | 1:51                                 |
| CP  | H94  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CQ  | H95  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CR  | H96  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CS  | H97  | 8:39                                 | 44                                     | 0:17                                   | 2:06                                 |
| CT  | H98  | 13:58                                | 44                                     | 0:25                                   | 2:46                                 |
| CU  | H99  | 28:27                                | 80                                     | 0:38                                   | 6:26                                 |
| CV  | H100 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CW  | H101 | 23:25                                | 82                                     | 0:27                                   | 3:00                                 |
| CX  | H102 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CY  | H103 | 14:34                                | 64                                     | 0:20                                   | 3:19                                 |
| CZ  | H104 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DA  | H105 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DB  | H106 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DC  | H107 | 7:37                                 | 36                                     | 0:15                                   | 0:55                                 |
| DD  | H108 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DE  | H109 | 45:40                                | 121                                    | 0:36                                   | 10:34                                |
| DF  | H110 | 28:07                                | 98                                     | 0:30                                   | 4:02                                 |
| DG  | H111 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DH  | H112 | 26:51                                | 78                                     | 0:33                                   | 6:25                                 |
| DI  | H113 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DJ  | H114 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DK  | H115 | 9:20                                 | 63                                     | 0:16                                   | 1:14                                 |
| DL  | H116 | 13:10                                | 63                                     | 0:18                                   | 2:52                                 |
| DM  | H117 | 12:02                                | 61                                     | 0:18                                   | 1:34                                 |
| DN  | H118 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DO  | H119 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DP  | H120 | 8:56                                 | 42                                     | 0:17                                   | 1:56                                 |
| DQ  | H121 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DR  | H122 | 21:14                                | 80                                     | 0:22                                   | 2:40                                 |
| DS  | H123 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DT  | H124 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DU  | H125 | 12:29                                | 53                                     | 0:20                                   | 3:01                                 |
| DV  | H126 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DW  | H127 | 89:37                                | 150                                    | 0:44                                   | 19:01                                |
| DX  | H128 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DY  | H129 | 94:51                                | 145                                    | 0:48                                   | 19:44                                |
| DZ  | H130 | 42:01                                | 118                                    | 0:36                                   | 9:28                                 |
| EA  | H131 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EB  | H132 | 7:12                                 | 42                                     | 0:16                                   | 0:58                                 |
| EC  | H133 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| ED  | H134 | 40:07                                | 108                                    | 0:36                                   | 8:40                                 |
| EE  | H135 | 26:25                                | 77                                     | 0:36                                   | 5:57                                 |
| EF  | H136 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EG  | H137 | 25:49                                | 87                                     | 0:36                                   | 5:10                                 |
| EH  | H138 | 28:17                                | 97                                     | 0:31                                   | 4:04                                 |
| EI  | H139 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EJ  | H140 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EK  | H141 | 3:33                                 | 19                                     | 0:15                                   | 0:39                                 |
| EL  | H142 | 9:43                                 | 44                                     | 0:18                                   | 2:06                                 |
| EM  | H143 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EN  | H144 | 2:51                                 | 18                                     | 0:14                                   | 0:34                                 |
| EO  | H145 | 2:33                                 | 25                                     | 0:08                                   | 0:32                                 |
| EP  | H146 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |

To be continued on next page...

## SHADOW - Main Result

Calculation: Worst Case

...continued from previous page

| No. | Name | Shadow, worst case                   |                                        | Shadow, expected values                |                                      |
|-----|------|--------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|
|     |      | Shadow hours<br>per year<br>[h/year] | Shadow days<br>per year<br>[days/year] | Max shadow<br>hours per day<br>[h/day] | Shadow hours<br>per year<br>[h/year] |
| EQ  | H147 | 35:07                                | 105                                    | 0:32                                   | 8:04                                 |
| ER  | H148 | 6:36                                 | 30                                     | 0:17                                   | 0:59                                 |
| ES  | H149 | 3:44                                 | 29                                     | 0:11                                   | 0:46                                 |
| ET  | H150 | 9:10                                 | 43                                     | 0:19                                   | 1:58                                 |
| EU  | H151 | 36:26                                | 86                                     | 0:36                                   | 4:47                                 |
| EV  | H152 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EW  | H153 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EX  | H154 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EY  | H155 | 9:03                                 | 38                                     | 0:18                                   | 1:51                                 |
| EZ  | H156 | 37:08                                | 69                                     | 0:48                                   | 6:45                                 |
| FA  | H157 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FB  | H158 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FC  | H159 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FD  | H160 | 3:17                                 | 18                                     | 0:14                                   | 0:41                                 |
| FE  | H161 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FF  | H162 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FG  | H163 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FH  | H164 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FI  | H165 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FJ  | H166 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FK  | H167 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FL  | H168 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FM  | H169 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FN  | H170 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FO  | H171 | 18:23                                | 83                                     | 0:17                                   | 3:57                                 |
| FP  | H172 | 7:56                                 | 40                                     | 0:17                                   | 1:48                                 |
| FQ  | H173 | 3:29                                 | 21                                     | 0:15                                   | 0:34                                 |
| FR  | H174 | 5:01                                 | 28                                     | 0:17                                   | 0:43                                 |
| FS  | H175 | 4:47                                 | 26                                     | 0:17                                   | 0:41                                 |
| FT  | H176 | 94:58                                | 163                                    | 1:12                                   | 14:44                                |
| FU  | H177 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FV  | H178 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FW  | H179 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FX  | H180 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FY  | H181 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FZ  | H182 | 42:31                                | 117                                    | 0:40                                   | 9:19                                 |
| GA  | H183 | 12:03                                | 49                                     | 0:22                                   | 2:29                                 |
| GB  | H184 | 44:31                                | 99                                     | 0:45                                   | 6:18                                 |
| GC  | H185 | 6:40                                 | 36                                     | 0:19                                   | 0:57                                 |
| GD  | H186 | 16:04                                | 69                                     | 0:21                                   | 2:07                                 |
| GE  | H187 | 31:49                                | 105                                    | 0:30                                   | 4:25                                 |
| GF  | H188 | 15:13                                | 60                                     | 0:22                                   | 3:39                                 |

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

| No. | Name | Worst case<br>[h/year] | Expected<br>[h/year] |
|-----|------|------------------------|----------------------|
| 1   | T06  | 209:21                 | 41:40                |
| 2   | T02  | 283:59                 | 52:32                |
| 3   | T03  | 228:12                 | 43:37                |
| 4   | T05  | 258:39                 | 43:43                |
| 5   | T01  | 165:33                 | 32:44                |
| 6   | T04  | 256:05                 | 46:31                |

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

### Calculation: Worst Case



New WTG

- Shadow receptor

Flicker map level: Height Contours: CONTOURLINE\_20240527\_Clare4n\_Revised\_SF\_Assessment\_3.wpo (4)  
Time step: 4 minutes, Day step: 14 days, Map resolution: 30 m, Visibility resolution: 15 m, Eye height: 1.5 m



Project:

20240527\_Clare4n\_Revised\_SF\_Assessment

Licensed user:

Macro Works Ltd

Hibernia House, Cherrywood, Loughlinstown

IE-D18 E440 Dublin

0035312303585

Peter Connell / peter.connell@macroworks.ie

Calculated:

07/07/2025 11:50/4.0.424

## SHADOW - Main Result

**Calculation:** Real Case

### Assumptions for shadow calculations

Maximum distance for influence 2,000 m  
 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) []

| Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 1.70 | 2.40 | 3.60 | 5.40 | 5.90 | 5.50 | 4.40 | 4.60 | 3.90 | 3.00 | 2.10 | 1.50 |

Operational time

| N   | NNE | NE  | ENE | E   | ESE | SE  | SSE | S   | SSW | SW  | WSW   |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 161 | 214 | 282 | 397 | 231 | 346 | 817 | 639 | 450 | 567 | 872 | 1,114 |

| W   | WNW | NW  | NNW | Sum   |
|-----|-----|-----|-----|-------|
| 793 | 818 | 765 | 294 | 8,760 |

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: CONTOURLINE\_20240527\_Clare4n\_R  
 Receptor grid resolution: 1.0 m

All coordinates are in

Irish ITM-IRENET95 (IE), geocentric, GRS80

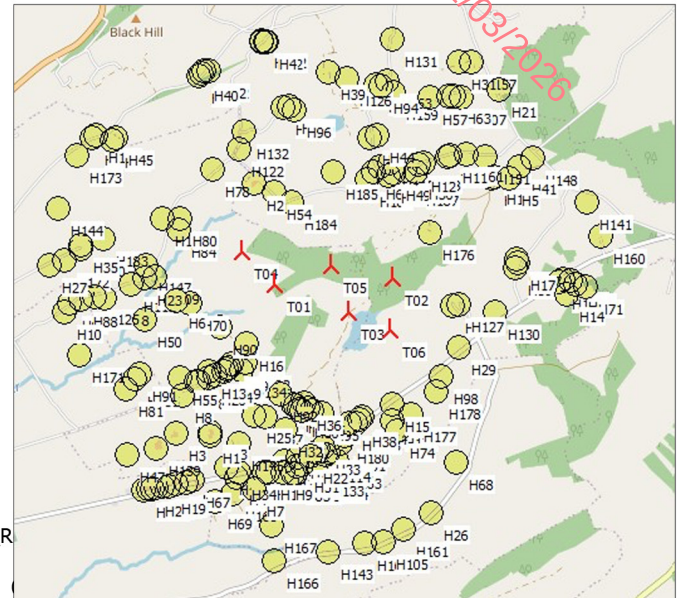
### WTGs

|   | Easting | Northing | Z     | Row data/Description | WTG type |           |                |              | Shadow data    |            |                      |       |
|---|---------|----------|-------|----------------------|----------|-----------|----------------|--------------|----------------|------------|----------------------|-------|
|   |         |          |       |                      | Valid    | Manufact. | Type-generator | Power, rated | Rotor diameter | Hub height | Calculation distance | RPM   |
|   |         |          | [m]   |                      |          |           |                | [kW]         | [m]            | [m]        | [m]                  | [RPM] |
| 1 | 510,310 | 681,176  | 190.0 | T06                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 2 | 510,339 | 681,648  | 183.1 | T02                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 3 | 509,923 | 681,348  | 189.1 | T03                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 4 | 509,773 | 681,776  | 171.7 | T05                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 5 | 509,248 | 681,617  | 160.0 | T01                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |
| 6 | 508,957 | 681,920  | 135.4 | T04                  | Yes      | VESTAS    | V117-4.2-4,200 | 4,200        | 117.0          | 91.5       | 2,000                | 13.6  |

### Shadow receptor-Input

| No. | Name | Easting | Northing | Z     | Width | Height | Elevation a.g.l. | Slope of window | Direction mode     | Eye height (ZVI) a.g.l. |
|-----|------|---------|----------|-------|-------|--------|------------------|-----------------|--------------------|-------------------------|
|     |      |         |          | [m]   | [m]   | [m]    | [m]              | [°]             |                    | [m]                     |
| A   | H1   | 508,632 | 680,244  | 143.8 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| B   | H2   | 509,084 | 682,541  | 141.5 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| C   | H3   | 508,326 | 680,267  | 150.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| D   | H4   | 509,228 | 683,830  | 110.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| E   | H5   | 511,430 | 682,538  | 104.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| F   | H6   | 508,351 | 681,477  | 105.8 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| G   | H7   | 509,026 | 679,746  | 145.4 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| H   | H8   | 508,393 | 680,615  | 132.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| I   | H9   | 509,301 | 679,892  | 160.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| J   | H10  | 507,319 | 681,392  | 88.3  | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| K   | H11  | 510,885 | 682,752  | 130.1 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| L   | H12  | 510,603 | 682,685  | 160.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| M   | H13  | 508,632 | 680,825  | 146.3 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| N   | H14  | 511,947 | 681,473  | 132.5 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| O   | H15  | 510,316 | 680,500  | 178.4 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| P   | H16  | 508,983 | 681,075  | 160.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| Q   | H17  | 511,498 | 681,770  | 125.9 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| R   | H18  | 509,161 | 679,898  | 155.5 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| S   | H19  | 508,247 | 679,785  | 130.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| T   | H20  | 508,630 | 680,768  | 147.6 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| U   | H21  | 511,347 | 683,347  | 84.4  | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| V   | H22  | 509,557 | 680,037  | 170.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| W   | H23  | 508,064 | 681,690  | 100.0 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |
| X   | H24  | 508,698 | 680,796  | 154.6 | 2.0   | 2.0    | 0.5              | 90.0            | "Green house mode" | 2.5                     |

To be continued on next page...



## SHADOW - Main Result

### Calculation: Real Case

...continued from previous page

| No.    | Name | Easting | Northing | Z     | Width | Height | Elevation<br>a.g.l. | Slope of<br>window | Direction mode     | Eye height<br>(ZVI) a.g.l. |
|--------|------|---------|----------|-------|-------|--------|---------------------|--------------------|--------------------|----------------------------|
|        |      |         |          | [m]   | [m]   | [m]    | [m]                 | [°]                |                    | [m]                        |
| Y H25  |      | 509,041 | 680,417  | 169.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| Z H26  |      | 510,655 | 679,499  | 141.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AA H27 |      | 507,190 | 681,828  | 86.0  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AB H28 |      | 508,096 | 679,765  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AC H29 |      | 510,938 | 681,006  | 154.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AD H30 |      | 510,580 | 682,615  | 154.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AE H31 |      | 510,987 | 683,607  | 82.6  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AF H32 |      | 509,325 | 680,288  | 161.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AG H33 |      | 509,678 | 680,112  | 170.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AH H34 |      | 508,896 | 679,897  | 139.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AI H35 |      | 507,475 | 682,004  | 104.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AJ H36 |      | 509,504 | 680,520  | 183.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AK H37 |      | 509,153 | 680,404  | 171.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AL H38 |      | 510,014 | 680,366  | 176.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AM H39 |      | 509,784 | 683,537  | 107.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AN H40 |      | 508,618 | 683,551  | 127.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AO H41 |      | 511,520 | 682,641  | 98.7  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AP H42 |      | 508,686 | 683,575  | 128.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AQ H43 |      | 508,634 | 680,271  | 146.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AR H44 |      | 510,219 | 682,951  | 152.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AS H45 |      | 507,816 | 682,980  | 118.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AT H46 |      | 508,877 | 679,851  | 139.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AU H47 |      | 507,866 | 680,083  | 126.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AV H48 |      | 508,781 | 679,942  | 131.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AW H49 |      | 510,371 | 682,606  | 180.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AX H50 |      | 508,051 | 681,312  | 92.4  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AY H51 |      | 509,478 | 679,960  | 167.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| AZ H52 |      | 509,478 | 679,960  | 167.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BA H53 |      | 510,325 | 682,586  | 180.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BB H54 |      | 509,264 | 682,451  | 150.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BC H55 |      | 508,372 | 680,777  | 113.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BD H56 |      | 508,372 | 680,777  | 113.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BE H57 |      | 510,719 | 683,290  | 103.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BF H58 |      | 510,644 | 682,692  | 155.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BG H59 |      | 511,473 | 681,721  | 127.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BH H60 |      | 509,485 | 680,450  | 179.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BI H61 |      | 511,046 | 682,767  | 118.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BJ H62 |      | 508,186 | 679,783  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BK H63 |      | 510,930 | 683,299  | 99.1  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BL H64 |      | 510,863 | 682,745  | 132.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BM H65 |      | 510,182 | 682,625  | 180.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BN H66 |      | 509,917 | 680,334  | 175.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BO H67 |      | 508,464 | 679,839  | 131.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BP H68 |      | 510,900 | 679,953  | 161.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BQ H69 |      | 508,667 | 679,635  | 124.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BR H70 |      | 508,471 | 681,454  | 108.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BS H71 |      | 512,121 | 681,532  | 125.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BT H72 |      | 508,413 | 679,816  | 130.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BU H73 |      | 510,888 | 683,298  | 100.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BV H74 |      | 510,356 | 680,257  | 160.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BW H75 |      | 510,151 | 682,935  | 154.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BX H76 |      | 509,433 | 679,952  | 165.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BY H77 |      | 507,781 | 682,954  | 116.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| BZ H78 |      | 508,706 | 682,667  | 140.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CA H79 |      | 508,775 | 680,828  | 161.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CB H80 |      | 508,394 | 682,223  | 140.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CC H81 |      | 507,872 | 680,682  | 103.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CD H82 |      | 509,212 | 683,830  | 110.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CE H83 |      | 509,391 | 679,883  | 161.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CF H84 |      | 508,383 | 682,127  | 129.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CG H85 |      | 509,541 | 680,471  | 181.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CH H86 |      | 508,797 | 680,846  | 163.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CI H87 |      | 508,516 | 680,741  | 133.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CJ H88 |      | 507,470 | 681,510  | 100.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |

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## SHADOW - Main Result

### Calculation: Real Case

...continued from previous page

| No.     | Name | Easting | Northing | Z     | Width | Height | Elevation<br>a.g.l. | Slope of<br>window | Direction mode     | Eye height<br>(ZVI) a.g.l. |
|---------|------|---------|----------|-------|-------|--------|---------------------|--------------------|--------------------|----------------------------|
|         |      |         |          | [m]   | [m]   | [m]    | [m]                 | [°]                |                    | [m]                        |
| CK H89  |      | 508,598 | 683,525  | 128.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CL H90  |      | 508,745 | 681,228  | 140.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CM H91  |      | 508,000 | 680,817  | 103.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CN H92  |      | 509,292 | 680,609  | 185.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CO H93  |      | 512,018 | 681,562  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CP H94  |      | 510,269 | 683,405  | 111.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CQ H95  |      | 509,674 | 680,427  | 180.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CR H96  |      | 509,467 | 683,200  | 150.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CS H97  |      | 507,364 | 681,478  | 99.1  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CT H98  |      | 510,770 | 680,743  | 168.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CU H99  |      | 508,850 | 680,887  | 163.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CV H100 |      | 509,423 | 683,234  | 149.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CW H101 |      | 510,467 | 682,626  | 172.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CX H102 |      | 509,182 | 683,842  | 112.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CY H103 |      | 508,542 | 680,735  | 137.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| CZ H104 |      | 509,459 | 680,471  | 180.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DA H105 |      | 510,216 | 679,245  | 112.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DB H106 |      | 509,446 | 680,029  | 168.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DC H107 |      | 511,000 | 683,279  | 95.8  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DD H108 |      | 508,132 | 679,771  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DE H109 |      | 508,150 | 681,697  | 100.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DF H110 |      | 511,290 | 682,552  | 106.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DG H111 |      | 509,362 | 683,220  | 146.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DH H112 |      | 507,936 | 681,631  | 100.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DI H113 |      | 509,980 | 680,331  | 173.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DJ H114 |      | 509,696 | 680,051  | 168.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DK H115 |      | 510,330 | 682,700  | 175.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DL H116 |      | 511,879 | 681,582  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DM H117 |      | 510,247 | 682,661  | 174.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DN H118 |      | 509,572 | 680,455  | 180.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DO H119 |      | 509,615 | 680,069  | 170.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DP H120 |      | 511,977 | 681,591  | 131.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DQ H121 |      | 508,314 | 679,808  | 130.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DR H122 |      | 508,946 | 682,856  | 140.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DS H123 |      | 509,173 | 683,830  | 113.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DT H124 |      | 509,427 | 680,496  | 180.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DU H125 |      | 507,593 | 681,531  | 98.5  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DV H126 |      | 509,955 | 683,474  | 112.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DW H127 |      | 510,947 | 681,400  | 156.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DX H128 |      | 509,724 | 680,070  | 168.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DY H129 |      | 510,885 | 681,380  | 169.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| DZ H130 |      | 511,286 | 681,320  | 137.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EA H131 |      | 510,375 | 683,825  | 82.7  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EB H132 |      | 508,999 | 683,013  | 136.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EC H133 |      | 509,631 | 679,917  | 163.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| ED H134 |      | 508,932 | 680,836  | 171.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EE H135 |      | 508,819 | 680,864  | 164.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EF H136 |      | 509,131 | 679,893  | 154.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EG H137 |      | 511,486 | 681,803  | 126.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EH H138 |      | 511,271 | 682,545  | 108.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EI H139 |      | 508,139 | 680,139  | 138.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EJ H140 |      | 508,139 | 680,139  | 138.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EK H141 |      | 512,144 | 682,310  | 110.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EL H142 |      | 511,914 | 681,606  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EM H143 |      | 509,704 | 679,161  | 100.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EN H144 |      | 507,277 | 682,339  | 118.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EO H145 |      | 508,895 | 680,171  | 143.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EP H146 |      | 509,418 | 679,874  | 161.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EQ H147 |      | 508,080 | 681,801  | 107.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| ER H148 |      | 511,655 | 682,715  | 92.3  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| ES H149 |      | 509,403 | 680,517  | 181.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| ET H150 |      | 507,478 | 681,972  | 101.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EU H151 |      | 511,216 | 682,745  | 105.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EV H152 |      | 508,637 | 683,574  | 126.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |

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Project:

20240527\_Clare4n\_Revised\_SF\_Assessment

Licensed user:

Macro Works Ltd

Hibernia House, Cherrywood, Loughlinstown

IE-D18 E440 Dublin

0035312303585

Peter Connell / peter.connell@macroworks.ie

Calculated:

07/07/2025 11:50/4.0.424

## SHADOW - Main Result

Calculation: Real Case

...continued from previous page

| No.     | Name | Easting | Northing | Z     | Width | Height | Elevation<br>a.g.l. | Slope of<br>window | Direction mode     | Eye height<br>(ZVI) a.g.l. |
|---------|------|---------|----------|-------|-------|--------|---------------------|--------------------|--------------------|----------------------------|
|         |      |         |          | [m]   | [m]   | [m]    | [m]                 | [°]                |                    | [m]                        |
| EW H153 |      | 510,328 | 683,452  | 106.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EX H154 |      | 510,037 | 680,382  | 176.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EY H155 |      | 507,953 | 680,772  | 103.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| EZ H156 |      | 508,239 | 682,230  | 135.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FA H157 |      | 511,101 | 683,605  | 80.7  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FB H158 |      | 510,219 | 683,412  | 112.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FC H159 |      | 510,383 | 683,344  | 110.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FD H160 |      | 512,261 | 681,992  | 105.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FE H161 |      | 510,402 | 679,351  | 127.3 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FF H162 |      | 510,038 | 679,233  | 110.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FG H163 |      | 509,802 | 679,984  | 160.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FH H164 |      | 509,665 | 679,887  | 160.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FI H165 |      | 509,312 | 679,994  | 161.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FJ H166 |      | 509,198 | 679,090  | 92.9  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FK H167 |      | 509,187 | 679,412  | 110.4 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FL H168 |      | 508,833 | 679,702  | 133.5 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FM H169 |      | 508,012 | 679,751  | 128.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FN H170 |      | 508,060 | 679,761  | 130.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FO H171 |      | 507,450 | 681,004  | 90.0  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FP H172 |      | 507,325 | 681,872  | 91.7  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FQ H173 |      | 507,461 | 682,818  | 117.1 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FR H174 |      | 507,631 | 683,005  | 111.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FS H175 |      | 507,605 | 682,985  | 112.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FT H176 |      | 510,696 | 682,054  | 150.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FU H177 |      | 510,483 | 680,398  | 170.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FV H178 |      | 510,729 | 680,609  | 163.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FW H179 |      | 510,315 | 680,348  | 168.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FX H180 |      | 509,874 | 680,216  | 168.7 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FY H181 |      | 509,831 | 680,151  | 167.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| FZ H182 |      | 508,969 | 680,902  | 168.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GA H183 |      | 507,690 | 682,061  | 109.9 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GB H184 |      | 509,429 | 682,352  | 167.0 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GC H185 |      | 509,819 | 682,632  | 178.8 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GD H186 |      | 510,126 | 682,551  | 178.6 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GE H187 |      | 510,546 | 682,559  | 150.2 | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |
| GF H188 |      | 507,686 | 681,509  | 93.2  | 2.0   | 2.0    | 0.5                 | 90.0               | "Green house mode" | 2.5                        |

## Calculation Results

Shadow receptor

| Shadow, worst case |      | Shadow, expected values              |                                        |                                        |                                      |
|--------------------|------|--------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|
| No.                | Name | Shadow hours<br>per year<br>[h/year] | Shadow days<br>per year<br>[days/year] | Max shadow<br>hours per day<br>[h/day] | Shadow hours<br>per year<br>[h/year] |
| A                  | H1   | 7:33                                 | 43                                     | 0:15                                   | 1:35                                 |
| B                  | H2   | 47:03                                | 106                                    | 0:38                                   | 6:12                                 |
| C                  | H3   | 6:21                                 | 40                                     | 0:13                                   | 1:18                                 |
| D                  | H4   | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| E                  | H5   | 27:34                                | 109                                    | 0:24                                   | 3:55                                 |
| F                  | H6   | 34:45                                | 102                                    | 0:42                                   | 8:12                                 |
| G                  | H7   | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| H                  | H8   | 12:21                                | 60                                     | 0:17                                   | 2:47                                 |
| I                  | H9   | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| J                  | H10  | 9:01                                 | 46                                     | 0:17                                   | 2:10                                 |
| K                  | H11  | 13:01                                | 50                                     | 0:23                                   | 1:53                                 |
| L                  | H12  | 24:55                                | 78                                     | 0:24                                   | 3:15                                 |
| M                  | H13  | 20:21                                | 66                                     | 0:34                                   | 4:39                                 |
| N                  | H14  | 9:26                                 | 43                                     | 0:17                                   | 2:07                                 |
| O                  | H15  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| P                  | H16  | 33:50                                | 85                                     | 0:44                                   | 7:59                                 |
| Q                  | H17  | 25:26                                | 83                                     | 0:37                                   | 5:07                                 |
| R                  | H18  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| S                  | H19  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| T                  | H20  | 20:42                                | 68                                     | 0:32                                   | 4:40                                 |

To be continued on next page...



## SHADOW - Main Result

Calculation: Real Case

...continued from previous page

| No. | Name | Shadow, worst case                   |                                        | Shadow, expected values                |                                      |
|-----|------|--------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|
|     |      | Shadow hours<br>per year<br>[h/year] | Shadow days<br>per year<br>[days/year] | Max shadow<br>hours per day<br>[h/day] | Shadow hours<br>per year<br>[h/year] |
| U   | H21  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| V   | H22  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| W   | H23  | 37:00                                | 107                                    | 0:34                                   | 8:39                                 |
| X   | H24  | 22:21                                | 72                                     | 0:33                                   | 5:02                                 |
| Y   | H25  | 16:47                                | 63                                     | 0:20                                   | 3:29                                 |
| Z   | H26  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AA  | H27  | 3:58                                 | 22                                     | 0:16                                   | 0:57                                 |
| AB  | H28  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AC  | H29  | 73:05                                | 122                                    | 0:57                                   | 16:11                                |
| AD  | H30  | 29:30                                | 98                                     | 0:26                                   | 4:01                                 |
| AE  | H31  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AF  | H32  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AG  | H33  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AH  | H34  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AI  | H35  | 8:56                                 | 44                                     | 0:18                                   | 1:52                                 |
| AJ  | H36  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AK  | H37  | 10:27                                | 46                                     | 0:19                                   | 2:09                                 |
| AL  | H38  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AM  | H39  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AN  | H40  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AO  | H41  | 22:16                                | 100                                    | 0:18                                   | 3:08                                 |
| AP  | H42  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AQ  | H43  | 6:49                                 | 39                                     | 0:16                                   | 1:27                                 |
| AR  | H44  | 3:04                                 | 24                                     | 0:13                                   | 0:26                                 |
| AS  | H45  | 7:50                                 | 40                                     | 0:19                                   | 1:05                                 |
| AT  | H46  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AU  | H47  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AV  | H48  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AW  | H49  | 16:13                                | 78                                     | 0:23                                   | 2:04                                 |
| AX  | H50  | 20:35                                | 82                                     | 0:26                                   | 4:49                                 |
| AY  | H51  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| AZ  | H52  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BA  | H53  | 15:44                                | 76                                     | 0:22                                   | 2:01                                 |
| BB  | H54  | 84:43                                | 80                                     | 1:31                                   | 10:31                                |
| BC  | H55  | 8:16                                 | 45                                     | 0:18                                   | 1:54                                 |
| BD  | H56  | 8:16                                 | 45                                     | 0:18                                   | 1:54                                 |
| BE  | H57  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BF  | H58  | 25:12                                | 91                                     | 0:24                                   | 3:23                                 |
| BG  | H59  | 26:37                                | 84                                     | 0:39                                   | 5:29                                 |
| BH  | H60  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BI  | H61  | 23:51                                | 68                                     | 0:35                                   | 3:03                                 |
| BJ  | H62  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BK  | H63  | 3:22                                 | 22                                     | 0:11                                   | 0:24                                 |
| BL  | H64  | 13:32                                | 52                                     | 0:23                                   | 1:57                                 |
| BM  | H65  | 12:27                                | 58                                     | 0:19                                   | 1:36                                 |
| BN  | H66  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BO  | H67  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BP  | H68  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BQ  | H69  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BR  | H70  | 45:25                                | 121                                    | 0:43                                   | 10:37                                |
| BS  | H71  | 7:37                                 | 40                                     | 0:15                                   | 1:41                                 |
| BT  | H72  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BU  | H73  | 1:16                                 | 14                                     | 0:07                                   | 0:08                                 |
| BV  | H74  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BW  | H75  | 3:44                                 | 28                                     | 0:14                                   | 0:32                                 |
| BX  | H76  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| BY  | H77  | 7:41                                 | 38                                     | 0:19                                   | 1:04                                 |
| BZ  | H78  | 24:32                                | 110                                    | 0:21                                   | 3:25                                 |
| CA  | H79  | 25:02                                | 78                                     | 0:34                                   | 5:37                                 |
| CB  | H80  | 50:12                                | 83                                     | 0:54                                   | 8:45                                 |
| CC  | H81  | 5:59                                 | 31                                     | 0:14                                   | 1:14                                 |
| CD  | H82  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CE  | H83  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |

To be continued on next page...

## SHADOW - Main Result

Calculation: Real Case

...continued from previous page

| No. | Name | Shadow, worst case                   |                                        | Shadow, expected values                |                                      |
|-----|------|--------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|
|     |      | Shadow hours<br>per year<br>[h/year] | Shadow days<br>per year<br>[days/year] | Max shadow<br>hours per day<br>[h/day] | Shadow hours<br>per year<br>[h/year] |
| CF  | H84  | 55:29                                | 89                                     | 0:59                                   | 10:35                                |
| CG  | H85  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CH  | H86  | 25:19                                | 76                                     | 0:35                                   | 5:42                                 |
| CI  | H87  | 13:47                                | 61                                     | 0:19                                   | 3:10                                 |
| CJ  | H88  | 10:17                                | 48                                     | 0:19                                   | 2:29                                 |
| CK  | H89  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CL  | H90  | 47:13                                | 147                                    | 0:26                                   | 10:31                                |
| CM  | H91  | 14:07                                | 61                                     | 0:18                                   | 3:02                                 |
| CN  | H92  | 24:19                                | 75                                     | 0:25                                   | 5:06                                 |
| CO  | H93  | 8:28                                 | 42                                     | 0:17                                   | 1:51                                 |
| CP  | H94  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CQ  | H95  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CR  | H96  | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CS  | H97  | 8:39                                 | 44                                     | 0:17                                   | 2:06                                 |
| CT  | H98  | 13:58                                | 44                                     | 0:25                                   | 2:46                                 |
| CU  | H99  | 28:27                                | 80                                     | 0:38                                   | 6:26                                 |
| CV  | H100 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CW  | H101 | 23:25                                | 82                                     | 0:27                                   | 3:00                                 |
| CX  | H102 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| CY  | H103 | 14:34                                | 64                                     | 0:20                                   | 3:19                                 |
| CZ  | H104 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DA  | H105 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DB  | H106 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DC  | H107 | 7:37                                 | 36                                     | 0:15                                   | 0:55                                 |
| DD  | H108 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DE  | H109 | 45:40                                | 121                                    | 0:36                                   | 10:34                                |
| DF  | H110 | 28:07                                | 98                                     | 0:30                                   | 4:02                                 |
| DG  | H111 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DH  | H112 | 26:51                                | 78                                     | 0:33                                   | 6:25                                 |
| DI  | H113 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DJ  | H114 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DK  | H115 | 9:20                                 | 63                                     | 0:16                                   | 1:14                                 |
| DL  | H116 | 13:10                                | 63                                     | 0:18                                   | 2:52                                 |
| DM  | H117 | 12:02                                | 61                                     | 0:18                                   | 1:34                                 |
| DN  | H118 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DO  | H119 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DP  | H120 | 8:56                                 | 42                                     | 0:17                                   | 1:56                                 |
| DQ  | H121 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DR  | H122 | 21:14                                | 80                                     | 0:22                                   | 2:40                                 |
| DS  | H123 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DT  | H124 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DU  | H125 | 12:29                                | 53                                     | 0:20                                   | 3:01                                 |
| DV  | H126 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DW  | H127 | 89:37                                | 150                                    | 0:44                                   | 19:01                                |
| DX  | H128 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| DY  | H129 | 94:51                                | 145                                    | 0:48                                   | 19:44                                |
| DZ  | H130 | 42:01                                | 118                                    | 0:36                                   | 9:28                                 |
| EA  | H131 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EB  | H132 | 7:12                                 | 42                                     | 0:16                                   | 0:58                                 |
| EC  | H133 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| ED  | H134 | 40:07                                | 108                                    | 0:36                                   | 8:40                                 |
| EE  | H135 | 26:25                                | 77                                     | 0:36                                   | 5:57                                 |
| EF  | H136 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EG  | H137 | 25:49                                | 87                                     | 0:36                                   | 5:10                                 |
| EH  | H138 | 28:17                                | 97                                     | 0:31                                   | 4:04                                 |
| EI  | H139 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EJ  | H140 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EK  | H141 | 3:33                                 | 19                                     | 0:15                                   | 0:39                                 |
| EL  | H142 | 9:43                                 | 44                                     | 0:18                                   | 2:06                                 |
| EM  | H143 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EN  | H144 | 2:51                                 | 18                                     | 0:14                                   | 0:34                                 |
| EO  | H145 | 2:33                                 | 25                                     | 0:08                                   | 0:32                                 |
| EP  | H146 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |

To be continued on next page...

## SHADOW - Main Result

Calculation: Real Case

...continued from previous page

| No. | Name | Shadow, worst case                   |                                        | Shadow, expected values                |                                      |
|-----|------|--------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|
|     |      | Shadow hours<br>per year<br>[h/year] | Shadow days<br>per year<br>[days/year] | Max shadow<br>hours per day<br>[h/day] | Shadow hours<br>per year<br>[h/year] |
| EQ  | H147 | 35:07                                | 105                                    | 0:32                                   | 8:04                                 |
| ER  | H148 | 6:36                                 | 30                                     | 0:17                                   | 0:59                                 |
| ES  | H149 | 3:44                                 | 29                                     | 0:11                                   | 0:46                                 |
| ET  | H150 | 9:10                                 | 43                                     | 0:19                                   | 1:58                                 |
| EU  | H151 | 36:26                                | 86                                     | 0:36                                   | 4:47                                 |
| EV  | H152 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EW  | H153 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EX  | H154 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| EY  | H155 | 9:03                                 | 38                                     | 0:18                                   | 1:51                                 |
| EZ  | H156 | 37:08                                | 69                                     | 0:48                                   | 6:45                                 |
| FA  | H157 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FB  | H158 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FC  | H159 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FD  | H160 | 3:17                                 | 18                                     | 0:14                                   | 0:41                                 |
| FE  | H161 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FF  | H162 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FG  | H163 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FH  | H164 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FI  | H165 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FJ  | H166 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FK  | H167 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FL  | H168 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FM  | H169 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FN  | H170 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FO  | H171 | 18:23                                | 83                                     | 0:17                                   | 3:57                                 |
| FP  | H172 | 7:56                                 | 40                                     | 0:17                                   | 1:48                                 |
| FQ  | H173 | 3:29                                 | 21                                     | 0:15                                   | 0:34                                 |
| FR  | H174 | 5:01                                 | 28                                     | 0:17                                   | 0:43                                 |
| FS  | H175 | 4:47                                 | 26                                     | 0:17                                   | 0:41                                 |
| FT  | H176 | 94:58                                | 163                                    | 1:12                                   | 14:44                                |
| FU  | H177 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FV  | H178 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FW  | H179 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FX  | H180 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FY  | H181 | 0:00                                 | 0                                      | 0:00                                   | 0:00                                 |
| FZ  | H182 | 42:31                                | 117                                    | 0:40                                   | 9:19                                 |
| GA  | H183 | 12:03                                | 49                                     | 0:22                                   | 2:29                                 |
| GB  | H184 | 44:31                                | 99                                     | 0:45                                   | 6:18                                 |
| GC  | H185 | 6:40                                 | 36                                     | 0:19                                   | 0:57                                 |
| GD  | H186 | 16:04                                | 69                                     | 0:21                                   | 2:07                                 |
| GE  | H187 | 31:49                                | 105                                    | 0:30                                   | 4:25                                 |
| GF  | H188 | 15:13                                | 60                                     | 0:22                                   | 3:39                                 |

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

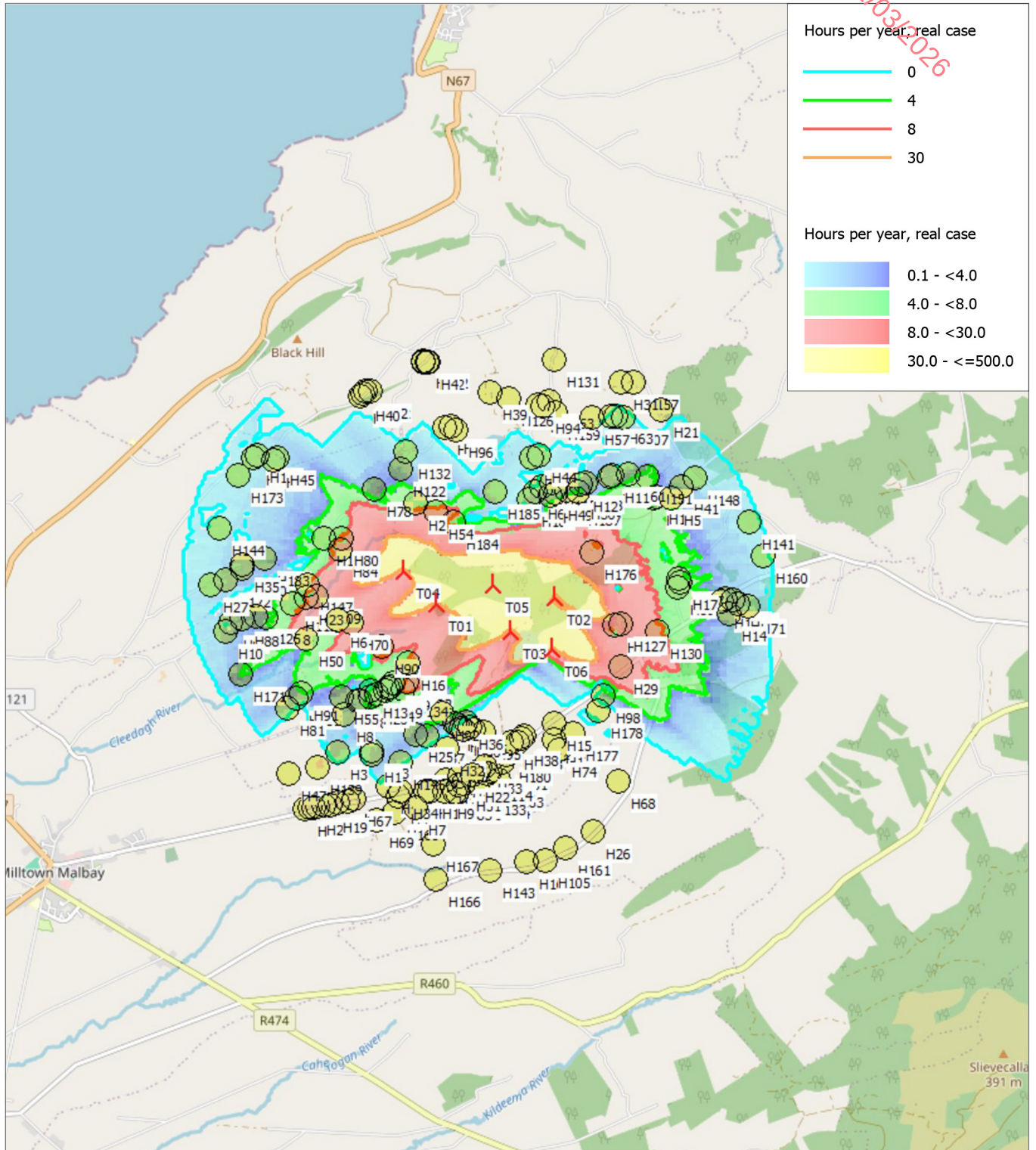
| No. | Name | Worst case<br>[h/year] | Expected<br>[h/year] |
|-----|------|------------------------|----------------------|
| 1   | T06  | 209:21                 | 41:40                |
| 2   | T02  | 283:59                 | 52:32                |
| 3   | T03  | 228:12                 | 43:37                |
| 4   | T05  | 258:39                 | 43:43                |
| 5   | T01  | 165:33                 | 32:44                |
| 6   | T04  | 256:05                 | 46:31                |

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

## SHADOW - Map

### Calculation: Real Case



A horizontal scale bar with markings at 0, 1, 2, 3, and 4 km.

Map: EMD OpenStreetMap , Print scale 1:75,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 509,790 North: 681,450

 New WTG

- Shadow receptor

Flicker map level: Height Contours: CONTOURLINE\_20240527\_Clare4n\_Revised\_SF\_Assessment\_3.wpo (4)

Time step: 4 minutes, Day step: 14 days, Map resolution: 30 m, Visibility resolution: 15 m, Eye height: 1.5 m