ForgeSolar

East Stour Solar Farm

East Stour Solar Farm Rail Receptors

Created Jan. 18, 2022
Updated Jan. 18, 2022
Time-step 1 minute
Timezone offset UTC0
Site ID 63824.11178

Project type Advanced
Project status: active
Category 10 MW to 100 MW

Misc. Analysis Settings

DNI: **varies (1,000.0 W/m^2 peak)**
Ocular transmission coefficient: **0.5**
Pupil diameter: **0.002 m**
Eye focal length: **0.017 m**
Sun subtended angle: **9.3 mrad**

Analysis Methodologies:

- Observation point: **Version 2**
- 2-Mile Flight Path: **Version 2**
- Route: **Version 2**

Summary of Results Glare with potential for temporary after-image predicted

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
East Array	20.0	180.0	0	0	-
North Array	20.0	180.0	9	26,642	-
South Array	20.0	180.0	121	8,120	-

Component Data

PV Array(s)

Total PV footprint area: 641,568 m^2

Name: East Array
Axis tracking: Fixed (no rotation)
Tilt: 20.0 deg
Orientation: 180.0 deg
Footprint area: 129,184 m^2
Rated power: -
Panel material: Light textured glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 9.16 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	51.099826	0.973245	55.57	3.00	58.57
2	51.099813	0.972430	55.74	3.00	58.74
3	51.098061	0.970134	65.93	3.00	68.93
4	51.096646	0.973567	59.44	3.00	62.44
5	51.098196	0.976636	59.09	3.00	62.09
6	51.097118	0.978631	69.31	3.00	72.31
7	51.098843	0.980412	59.51	3.00	62.51
8	51.099678	0.978095	59.46	3.00	62.46
9	51.099665	0.977751	58.81	3.00	61.81
10	51.098977	0.977043	57.64	3.00	60.64
11	51.099570	0.976314	56.98	3.00	59.98
12	51.098236	0.974790	59.01	3.00	62.01

Name: North Array
Axis tracking: Fixed (no rotation)
Tilt: 20.0 deg
Orientation: 180.0 deg
Footprint area: 166,796 m^2
Rated power: -
Panel material: Light textured glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 9.16 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	51.112612	0.961030	65.41	3.00	68.41
2	51.111440	0.961523	62.39	3.00	65.39
3	51.110834	0.962167	62.47	3.00	65.47
4	51.110430	0.962038	61.36	3.00	64.36
5	51.109797	0.961223	53.45	3.00	56.45
6	51.108934	0.961266	50.73	3.00	53.73
7	51.108584	0.962897	50.54	3.00	53.54
8	51.108247	0.963326	50.62	3.00	53.62
9	51.107776	0.962939	51.12	3.00	54.12
10	51.107439	0.962532	50.74	3.00	53.74
11	51.107250	0.962510	50.18	3.00	53.18
12	51.107250	0.963218	50.99	3.00	53.99
13	51.108086	0.966437	50.72	3.00	53.72
14	51.109217	0.967210	52.69	3.00	55.69
15	51.109648	0.969784	50.80	3.00	53.80
16	51.111117	0.966158	59.75	3.00	62.75
17	51.110497	0.964141	61.64	3.00	64.64
18	51.111332	0.965171	60.88	3.00	63.88

Name: South Array
Axis tracking: Fixed (no rotation)
Tilt: 20.0 deg
Orientation: 180.0 deg
Footprint area: 345,588 m^2
Rated power: -
Panel material: Light textured glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 9.16 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	51.105162	0.961158	50.98	3.00	53.98
2	51.102157	0.961201	64.02	3.00	67.02
3	51.101686	0.961523	65.71	3.00	68.71
4	51.101551	0.961158	63.97	3.00	66.97
5	51.100770	0.961158	64.17	3.00	67.17
6	51.098654	0.963175	60.40	3.00	63.40
7	51.098290	0.966416	67.37	3.00	70.37
8	51.099341	0.968433	67.83	3.00	70.83
9	51.102925	0.967725	57.50	3.00	60.50
10	51.103411	0.967252	54.53	3.00	57.53
11	51.103653	0.967617	51.96	3.00	54.96
12	51.103208	0.968969	54.01	3.00	57.01
13	51.103101	0.972274	52.86	3.00	55.86
14	51.103747	0.972617	51.80	3.00	54.80
15	51.104017	0.972038	50.90	3.00	53.90
16	51.104084	0.970085	51.65	3.00	54.65
17	51.103828	0.969978	51.92	3.00	54.92
18	51.103828	0.969355	51.96	3.00	54.96
19	51.104205	0.969269	51.21	3.00	54.21
20	51.104408	0.969420	50.39	3.00	53.39
21	51.104515	0.969248	49.90	3.00	52.90
22	51.104084	0.967553	50.48	3.00	53.48
23	51.105351	0.963519	51.03	3.00	54.03

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	m	m	m
OP 1	51.109334	0.946637	55.02	2.75	57.77
OP 2	51.108607	0.949662	55.78	2.75	58.53
OP 3	51.108068	0.952066	55.90	2.75	58.65
OP 4	51.107543	0.954812	54.16	2.75	56.91
OP 5	51.107098	0.957602	53.39	2.75	56.14
OP 6	51.106653	0.960777	52.48	2.75	55.23
OP 7	51.106303	0.963331	52.55	2.75	55.30
OP 8	51.105899	0.965949	53.68	2.75	56.43
OP 9	51.105535	0.968631	53.97	2.75	56.72
OP 10	51.105131	0.971420	54.56	2.75	57.31
OP 11	51.104740	0.974424	54.86	2.75	57.61
OP 12	51.104336	0.977171	55.36	2.75	58.11
OP 13	51.103959	0.979639	56.62	2.75	59.37
OP 14	51.103541	0.982471	57.09	2.75	59.84
OP 15	51.103083	0.985647	58.18	2.75	60.93
OP 16	51.102652	0.988672	59.86	2.75	62.61
OP 17	51.102288	0.991376	60.96	2.75	63.71

Summary of PV Glare Analysis

PV configuration and total predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
East Array	20.0	180.0	0	0	-	
North Array	20.0	180.0	9	26,642	-	-
South Array	20.0	180.0	121	8,120	-	-

Distinct glare per month

Excludes overlapping glare from PV array for multiple receptors at matching time(s)

PV	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
north-array (green)	0	0	0	0	0	0	0	0	1	0	0	0
north-array (yellow)	0	0	200	569	1041	1109	1094	777	364	0	0	0
south-array (green)	0	0	18	0	0	0	0	0	21	0	0	0
south-array (yellow)	0	0	228	399	0	0	0	216	403	1	0	0

PV & Receptor Analysis Results

Results for each PV array and receptor

East Array no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	0
OP: OP 5	0	0
OP: OP 6	0	0
OP: OP 7	0	0
OP: OP 8	0	0
OP: OP 9	0	0
OP: OP 10	0	0
OP: OP 11	0	0
OP: OP 12	0	0
OP: OP 13	0	0
OP: OP 14	0	0
OP: OP 15	0	0
OP: OP 16	0	0
OP: OP 17	0	0

No glare found

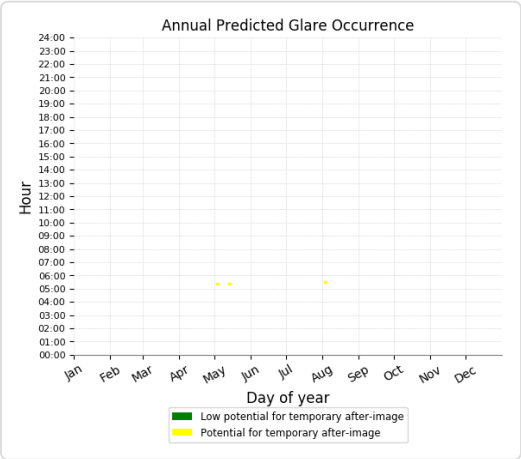
North Array potential temporary after-image

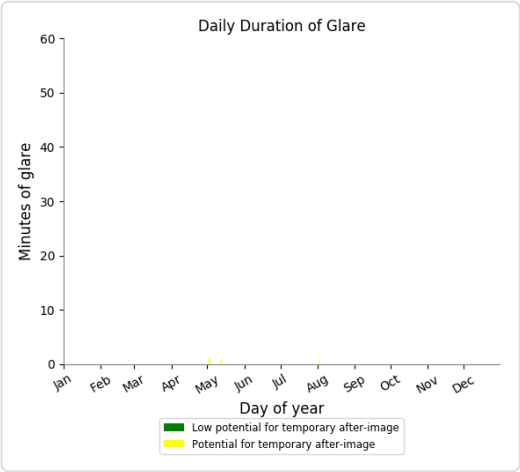
Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	3
OP: OP 2	9	2025
OP: OP 3	0	2711
OP: OP 4	0	2708
OP: OP 5	0	2720
OP: OP 6	0	1426
OP: OP 7	0	0
OP: OP 8	0	0
OP: OP 9	0	903
OP: OP 10	0	1422
OP: OP 11	0	1593
OP: OP 12	0	1737
OP: OP 13	0	1805
OP: OP 14	0	1766
OP: OP 15	0	1893
OP: OP 16	0	1950
OP: OP 17	0	1980

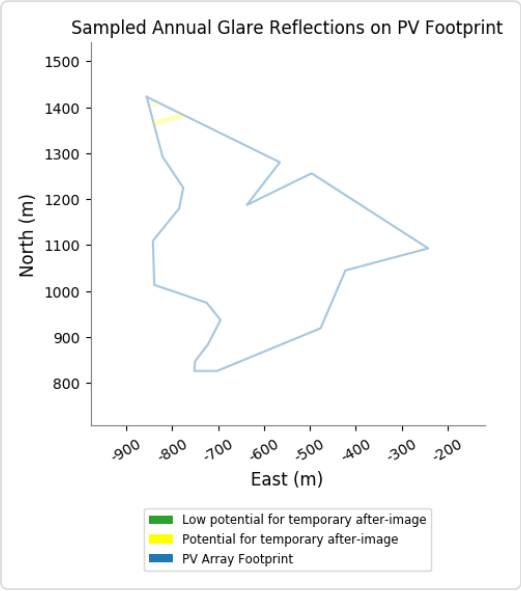
North Array - OP Receptor (OP 1)

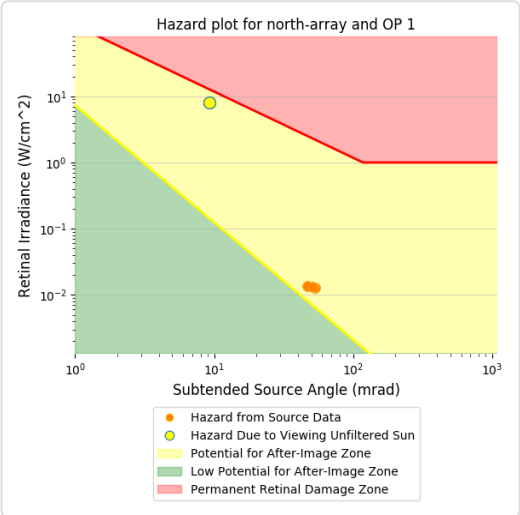
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 3 minutes of "yellow" glare with potential to cause temporary after-image.





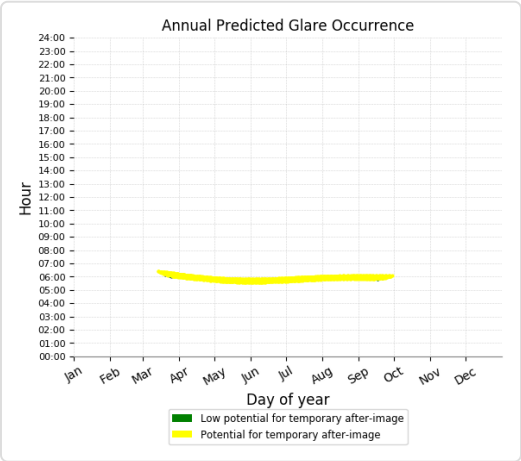


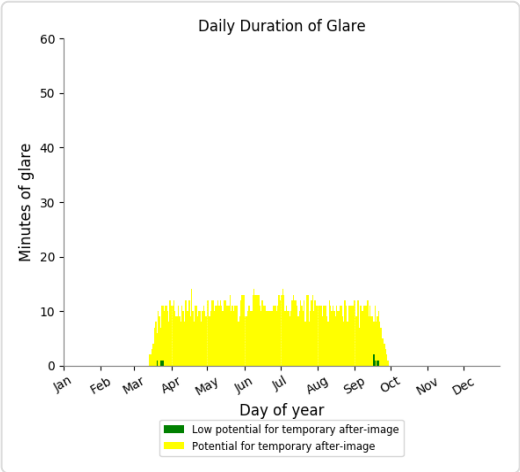


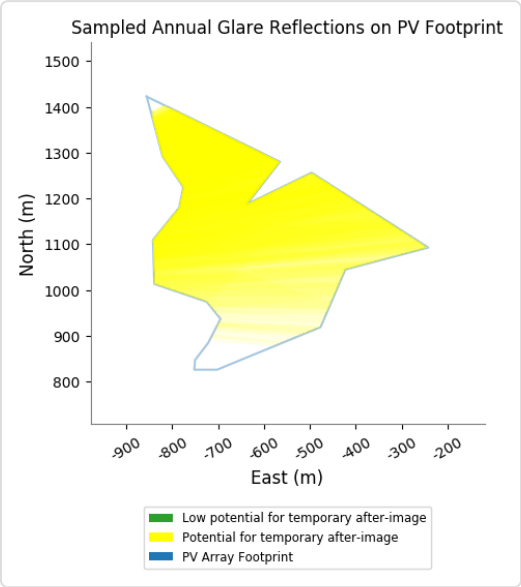
North Array - OP Receptor (OP 2)

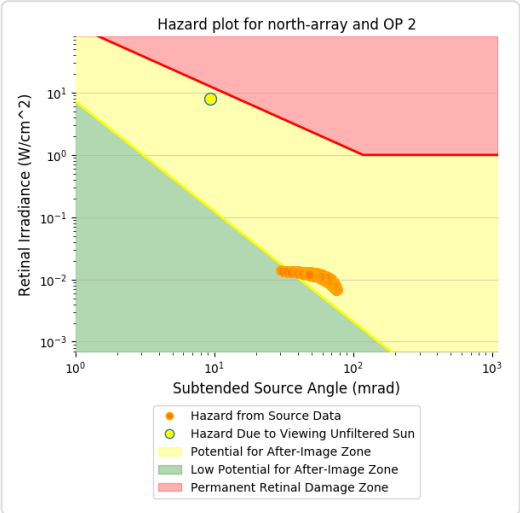
PV array is expected to produce the following glare for receptors at this location:

- 9 minutes of "green" glare with low potential to cause temporary after-image.
- 2,025 minutes of "yellow" glare with potential to cause temporary after-image.





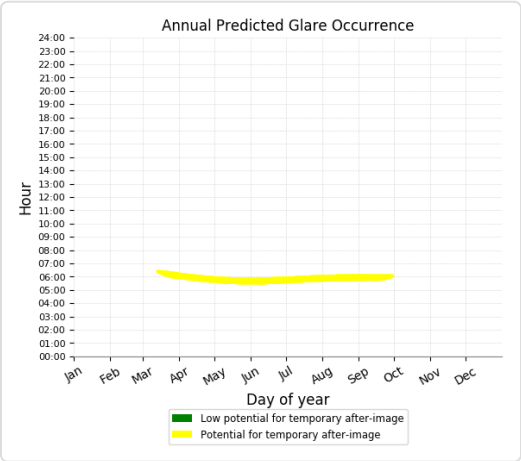


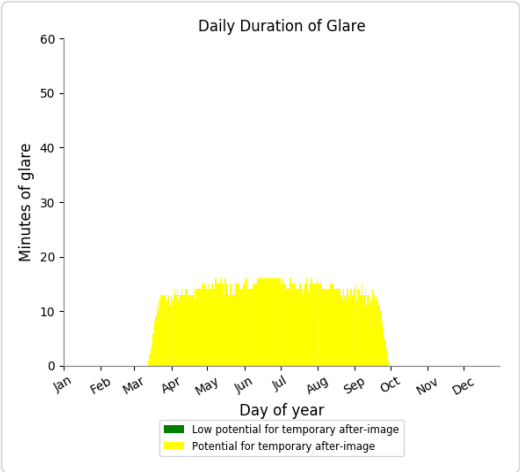


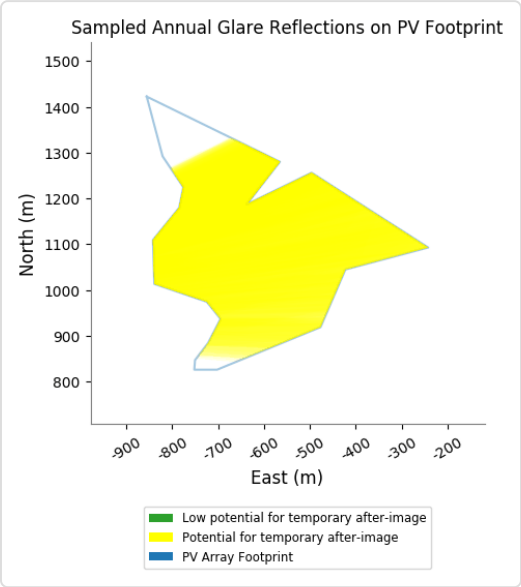
North Array - OP Receptor (OP 3)

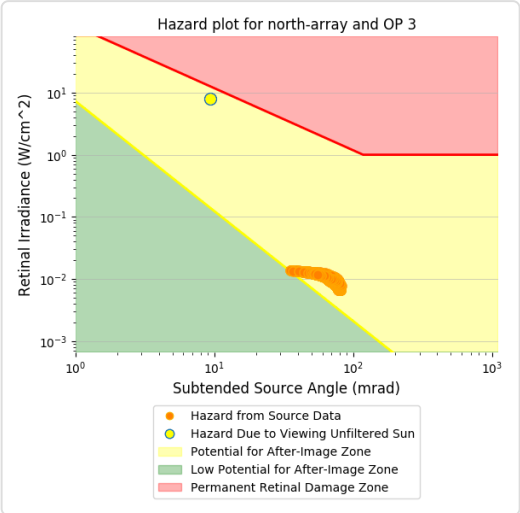
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,711 minutes of "yellow" glare with potential to cause temporary after-image.





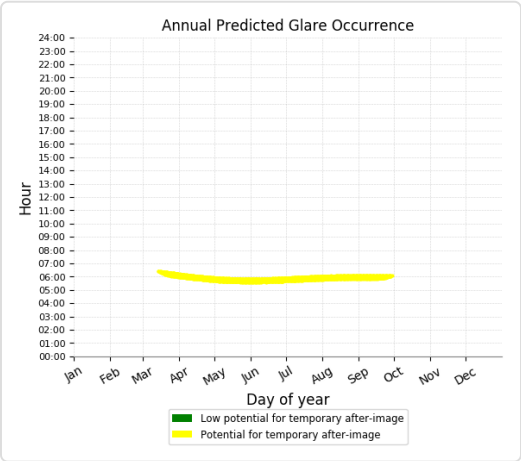


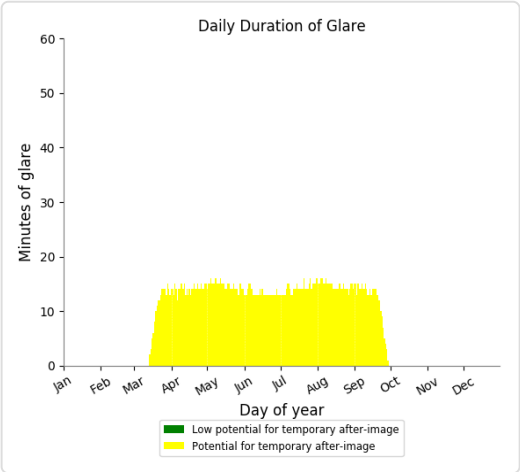


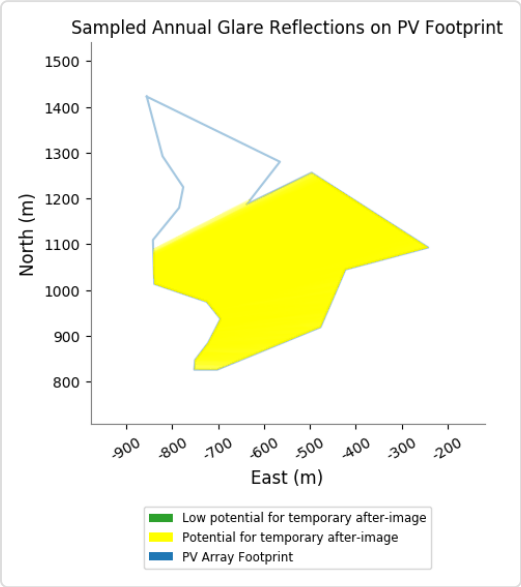
North Array - OP Receptor (OP 4)

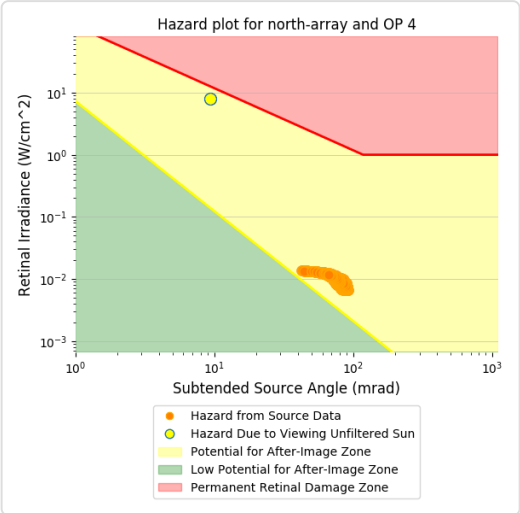
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,708 minutes of "yellow" glare with potential to cause temporary after-image.





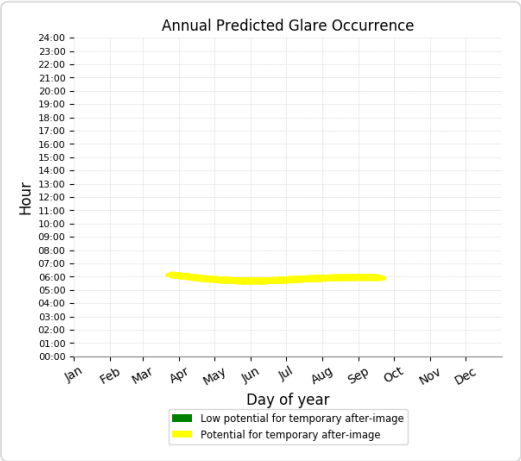


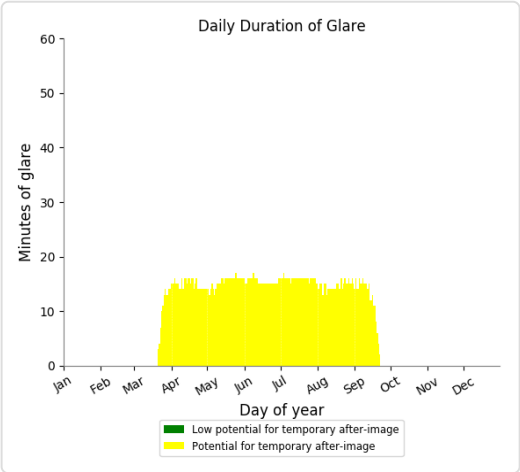


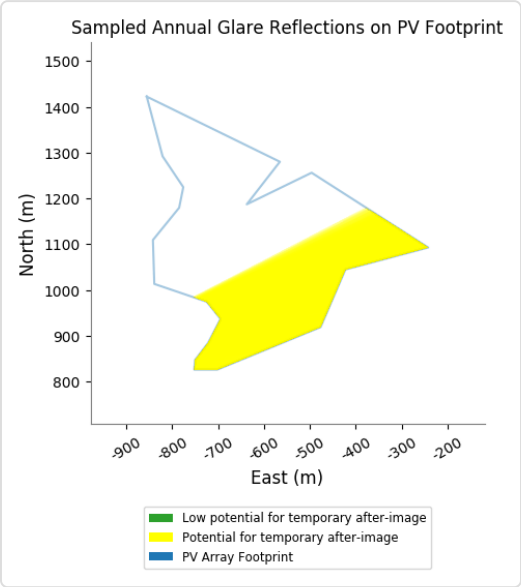
North Array - OP Receptor (OP 5)

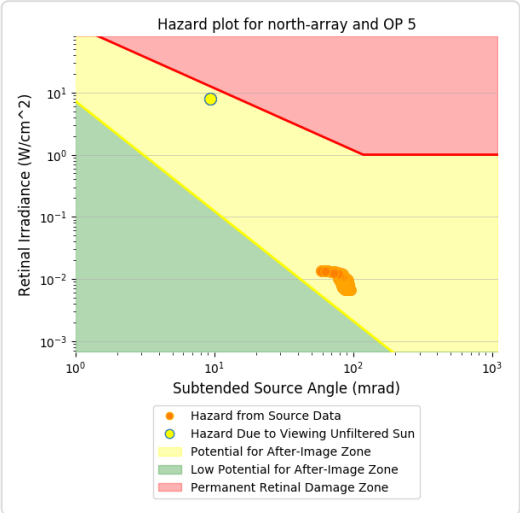
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,720 minutes of "yellow" glare with potential to cause temporary after-image.





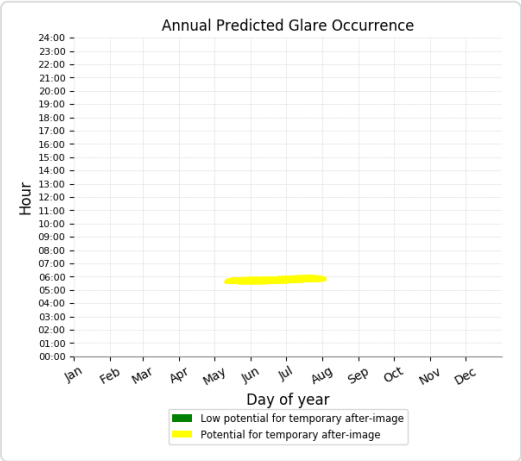


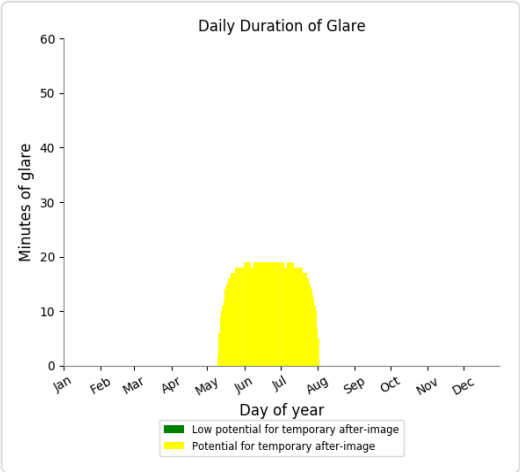


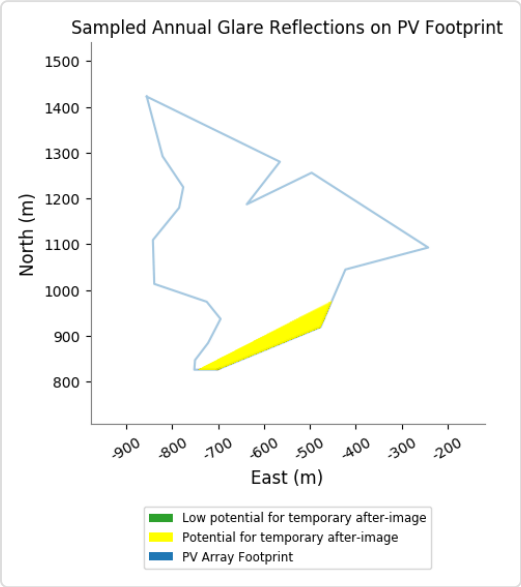
North Array - OP Receptor (OP 6)

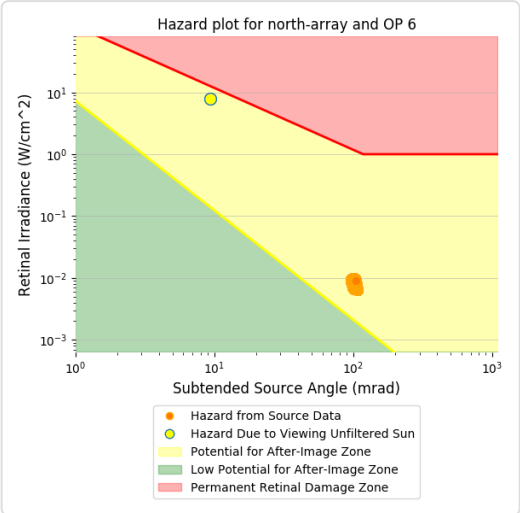
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,426 minutes of "yellow" glare with potential to cause temporary after-image.









North Array - OP Receptor (OP 7)

No glare found

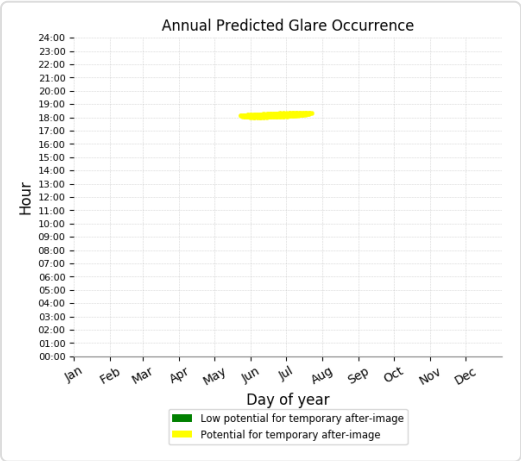
North Array - OP Receptor (OP 8)

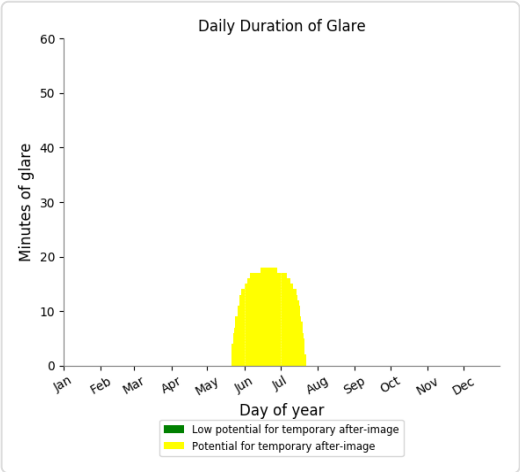
No glare found

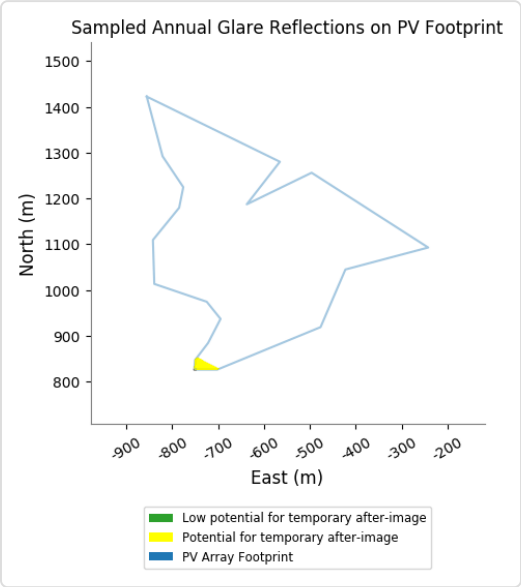
North Array - OP Receptor (OP 9)

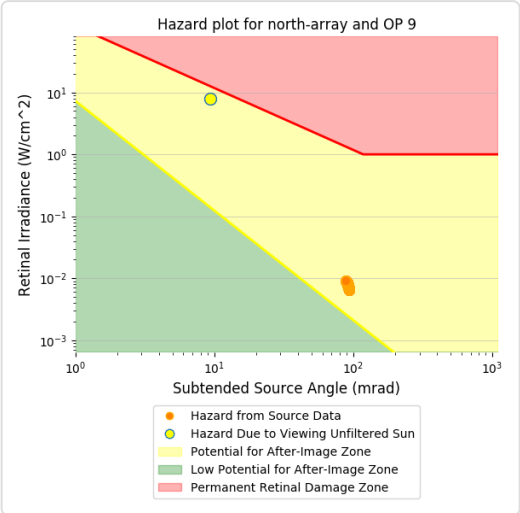
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 903 minutes of "yellow" glare with potential to cause temporary after-image.





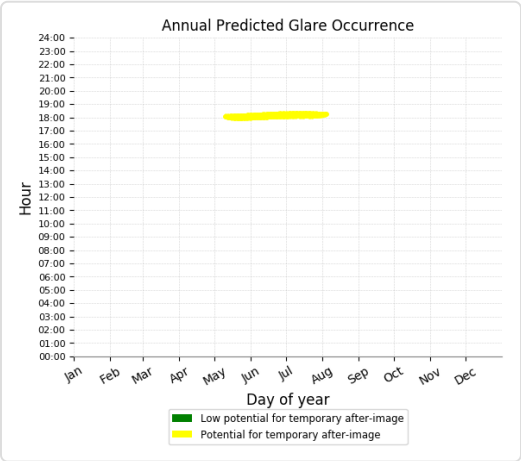


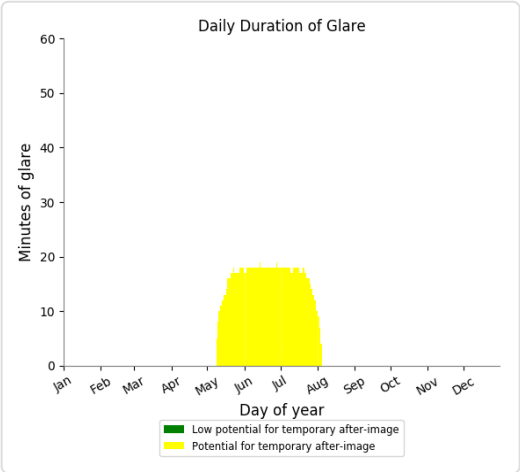


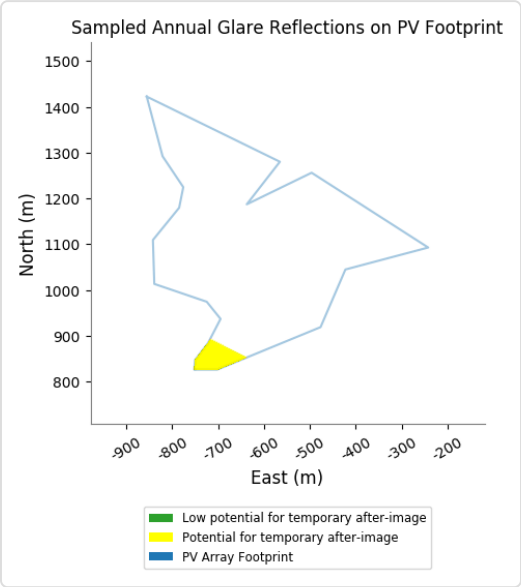
North Array - OP Receptor (OP 10)

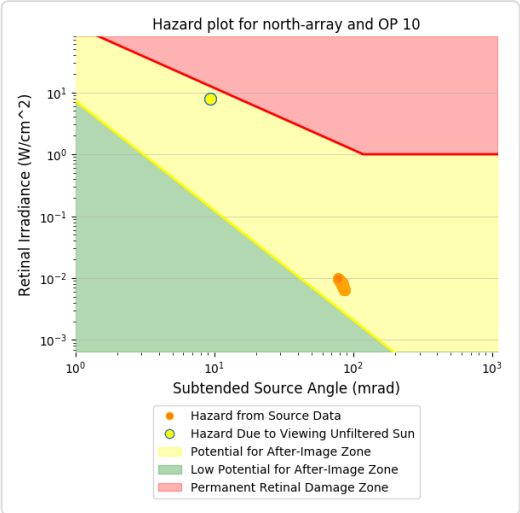
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,422 minutes of "yellow" glare with potential to cause temporary after-image.





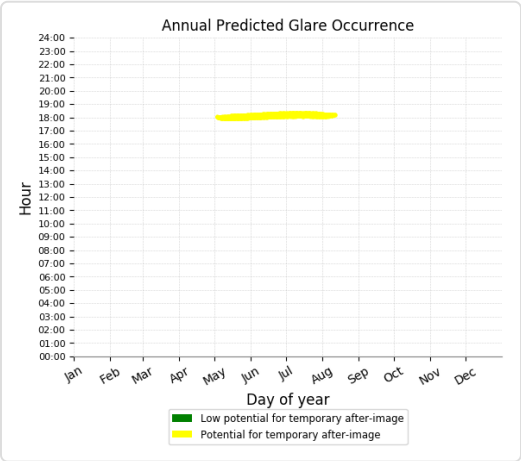


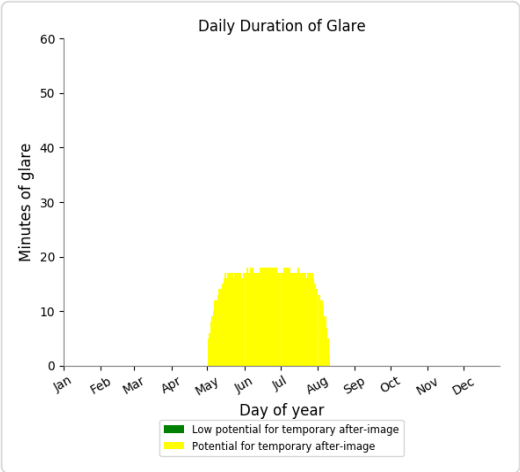


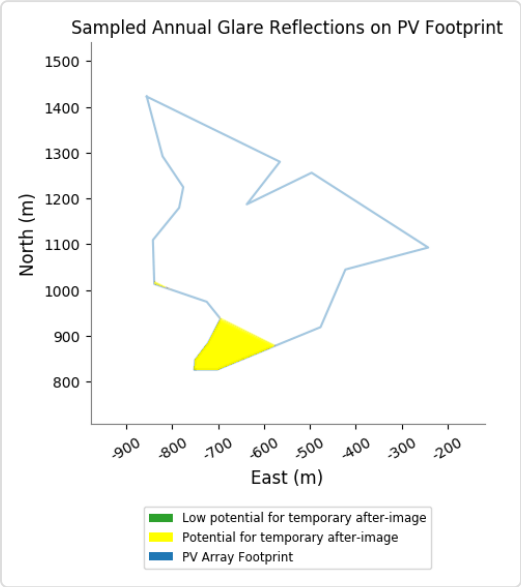
North Array - OP Receptor (OP 11)

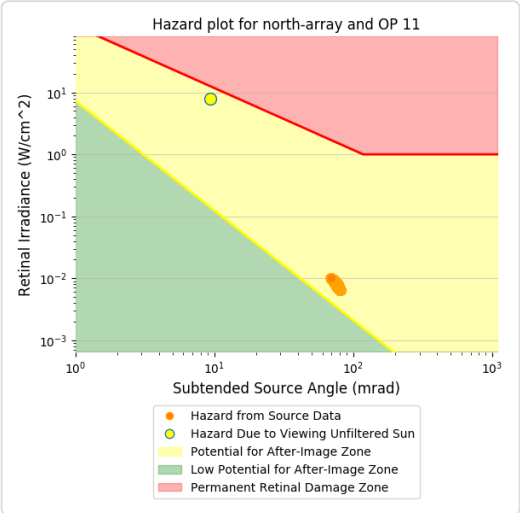
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,593 minutes of "yellow" glare with potential to cause temporary after-image.





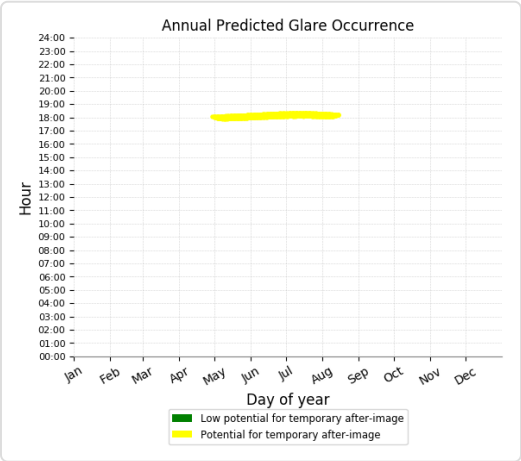


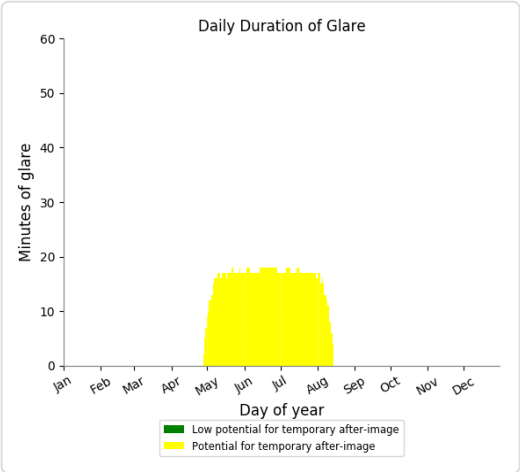


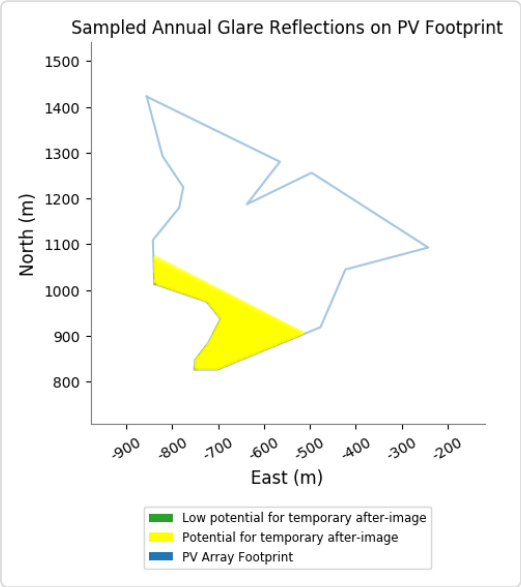
North Array - OP Receptor (OP 12)

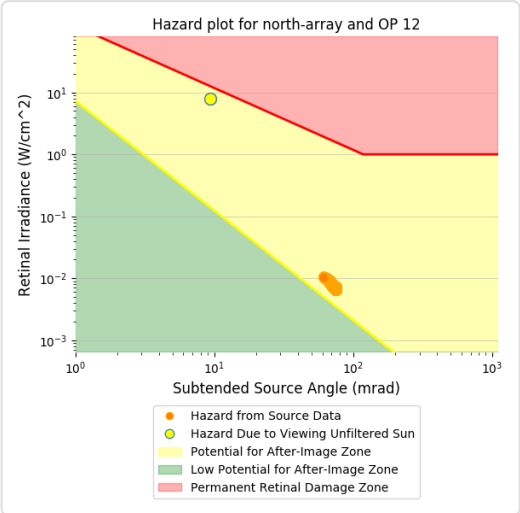
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,737 minutes of "yellow" glare with potential to cause temporary after-image.





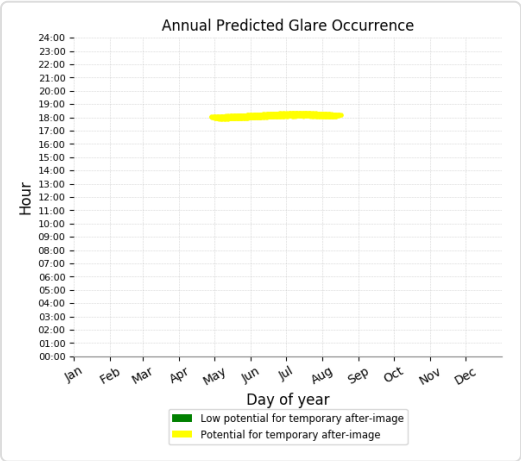


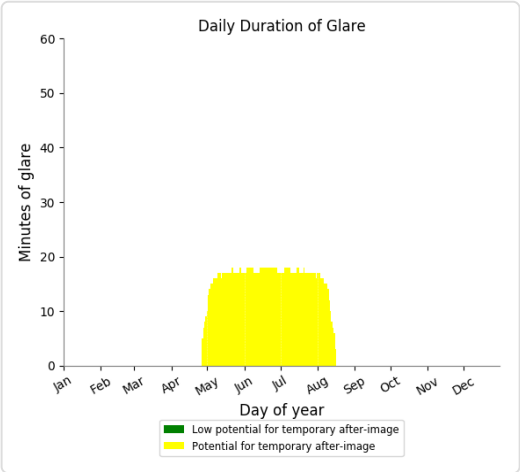


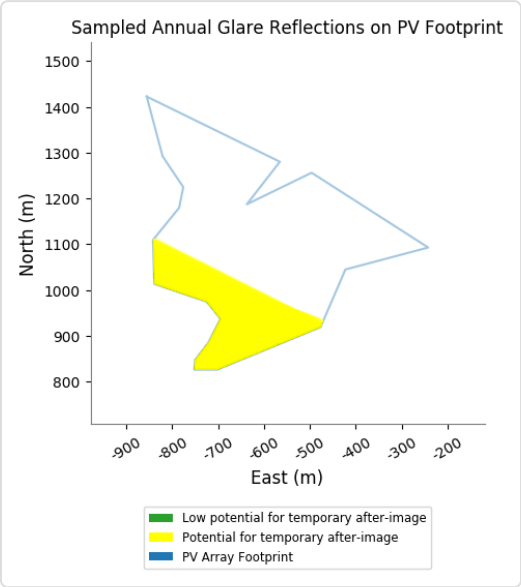
North Array - OP Receptor (OP 13)

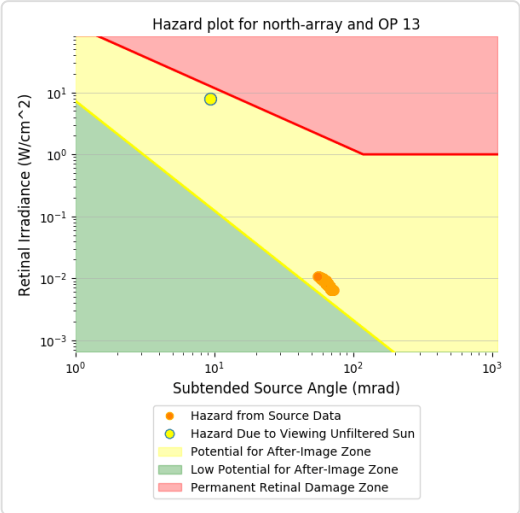
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,805 minutes of "yellow" glare with potential to cause temporary after-image.





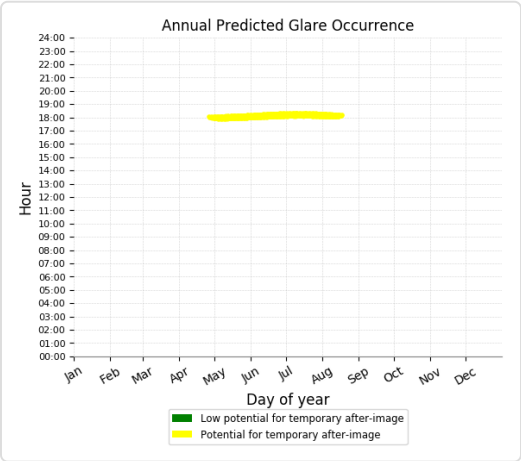


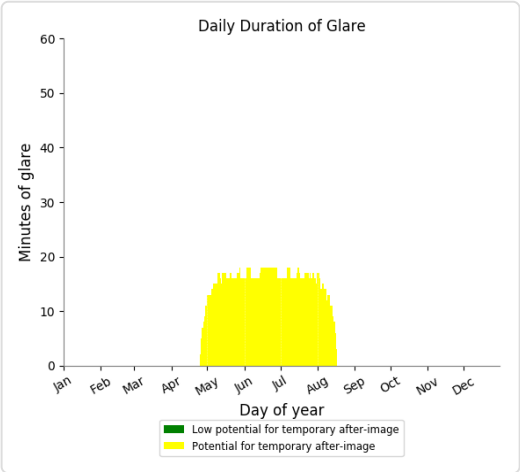


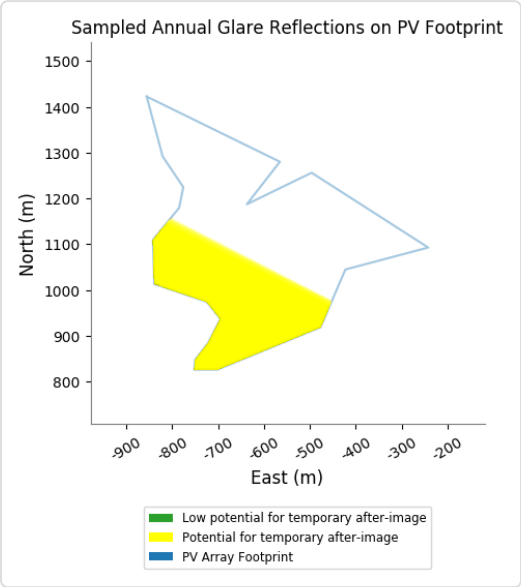
North Array - OP Receptor (OP 14)

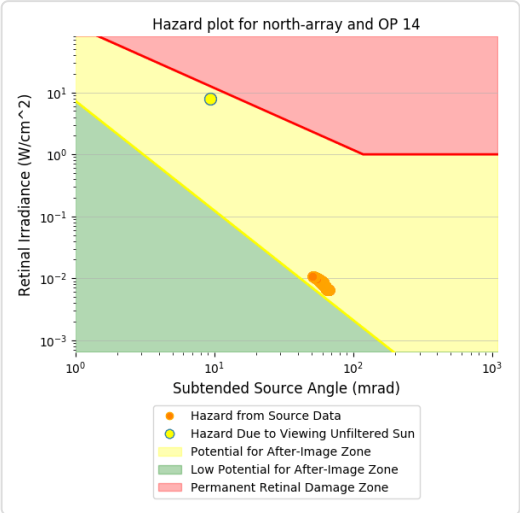
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,766 minutes of "yellow" glare with potential to cause temporary after-image.





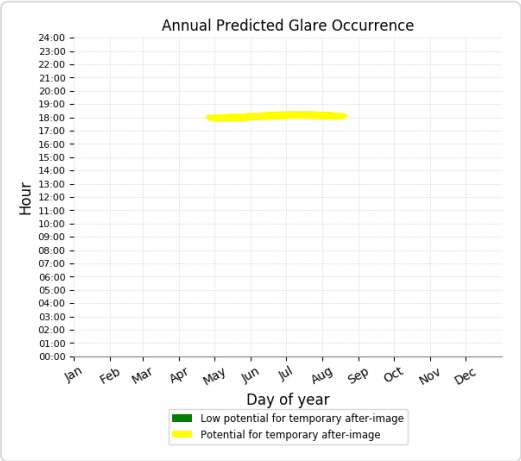


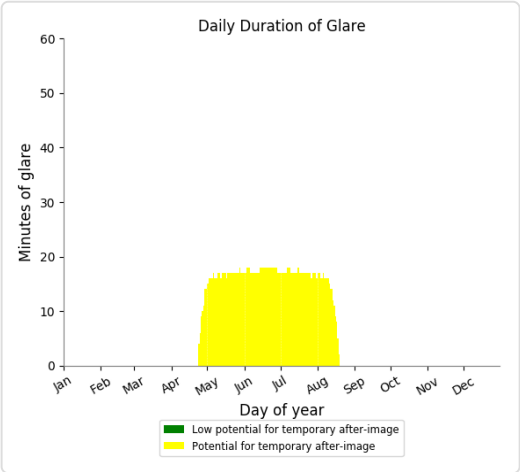


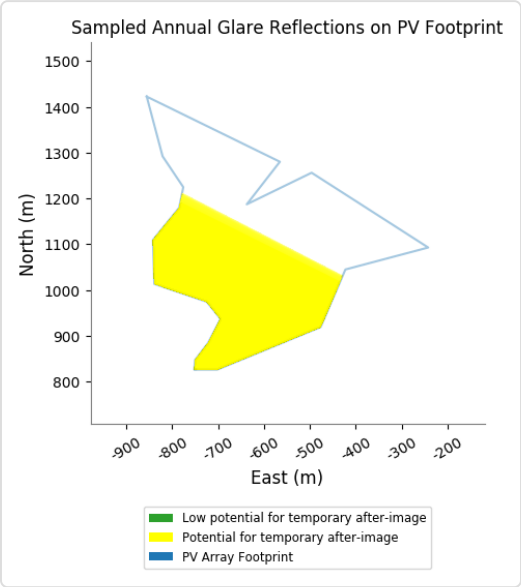
North Array - OP Receptor (OP 15)

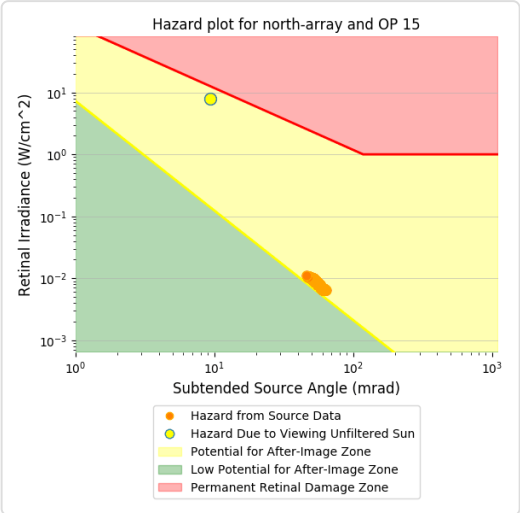
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,893 minutes of "yellow" glare with potential to cause temporary after-image.





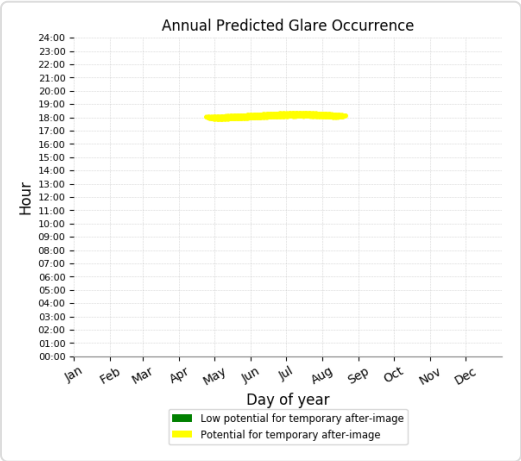


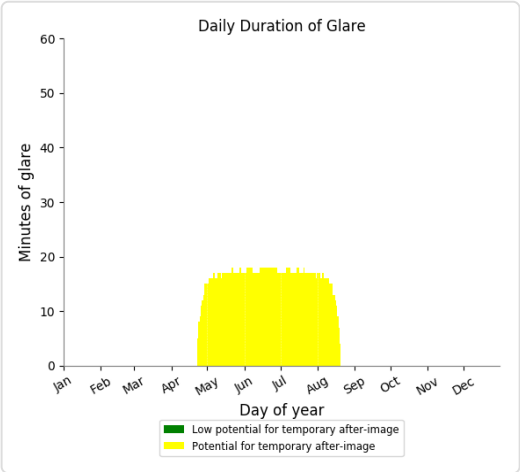


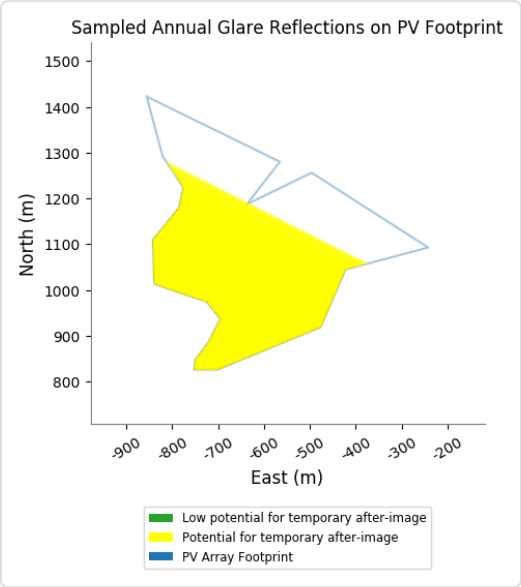
North Array - OP Receptor (OP 16)

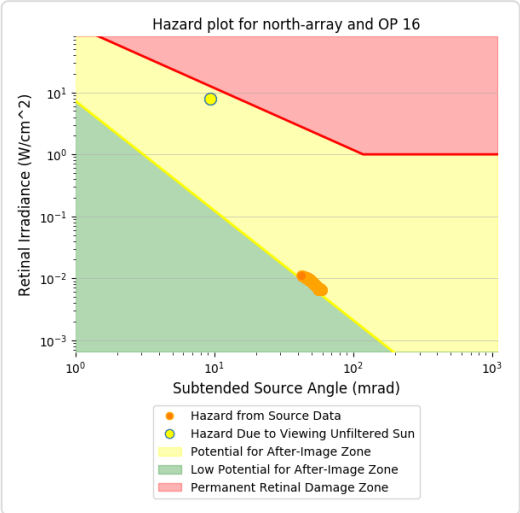
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,950 minutes of "yellow" glare with potential to cause temporary after-image.





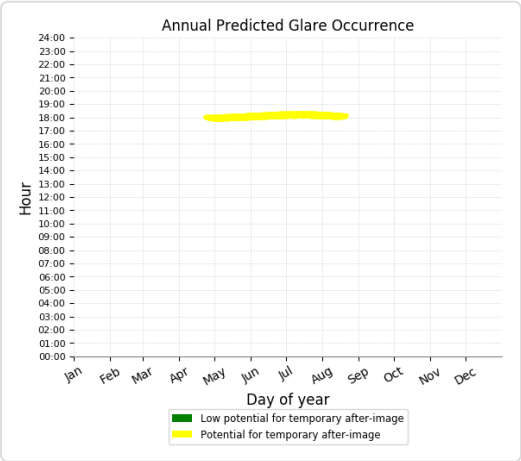


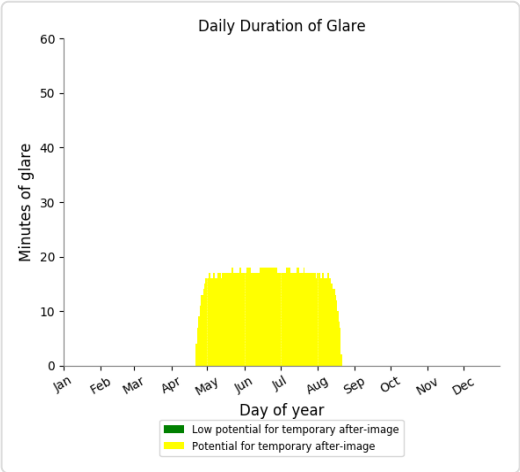


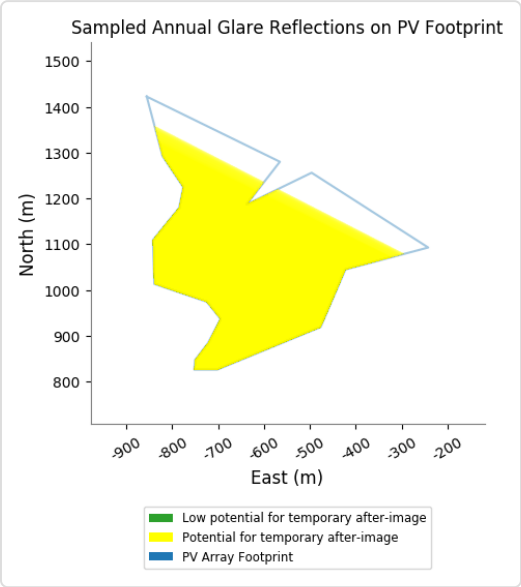
North Array - OP Receptor (OP 17)

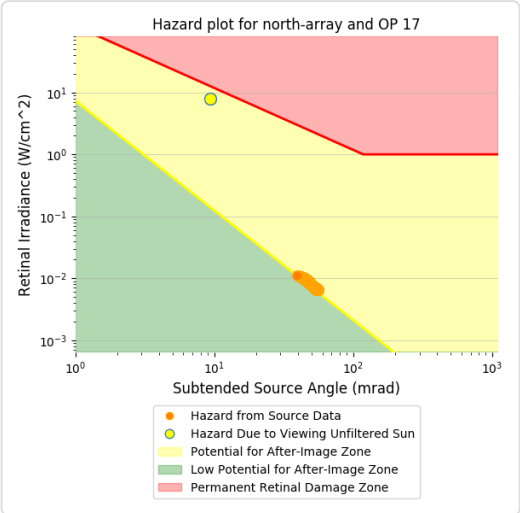
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,980 minutes of "yellow" glare with potential to cause temporary after-image.









South Array potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	0
OP: OP 5	0	0
OP: OP 6	0	0
OP: OP 7	0	0
OP: OP 8	0	0
OP: OP 9	0	157
OP: OP 10	0	610
OP: OP 11	0	788
OP: OP 12	0	979
OP: OP 13	0	1089
OP: OP 14	0	1143
OP: OP 15	11	1094
OP: OP 16	39	1139
OP: OP 17	71	1121

South Array - OP Receptor (OP 1)

No glare found

South Array - OP Receptor (OP 2)

No glare found

South Array - OP Receptor (OP 3)

No glare found

South Array - OP Receptor (OP 4)

No glare found

South Array - OP Receptor (OP 5)

No glare found

South Array - OP Receptor (OP 6)

No glare found

South Array - OP Receptor (OP 7)

No glare found

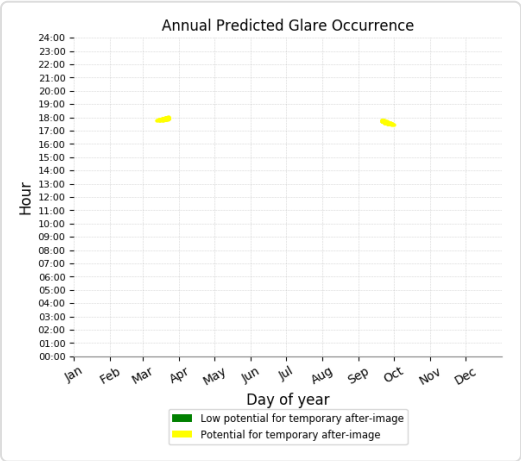
South Array - OP Receptor (OP 8)

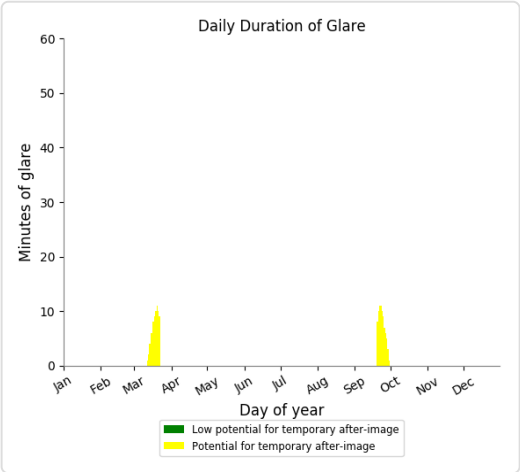
No glare found

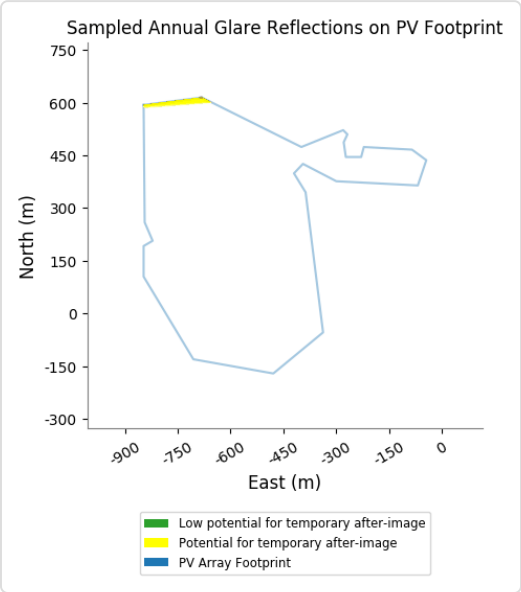
South Array - OP Receptor (OP 9)

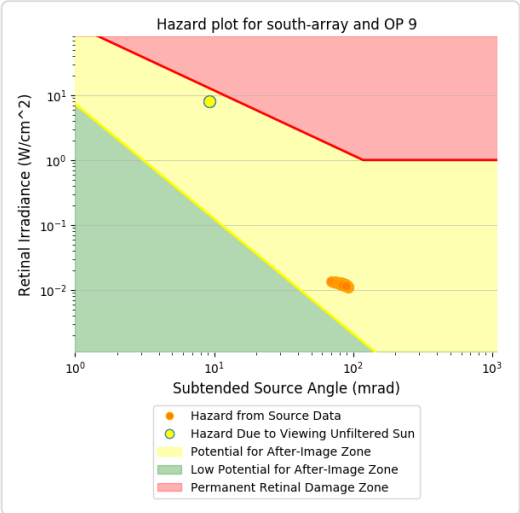
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 157 minutes of "yellow" glare with potential to cause temporary after-image.





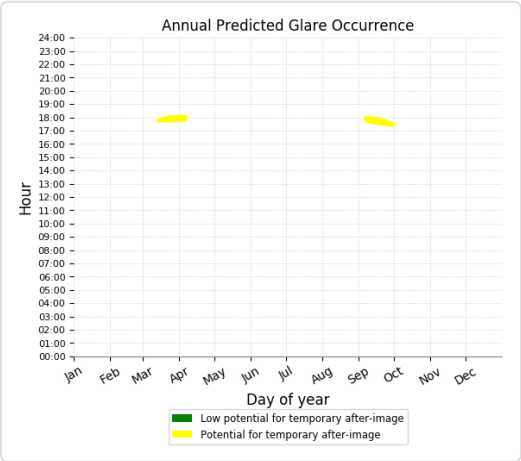


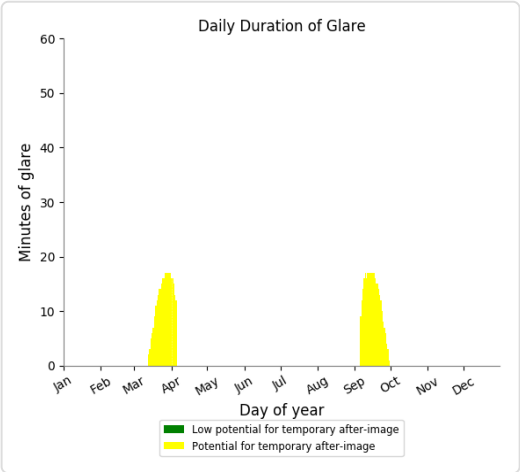


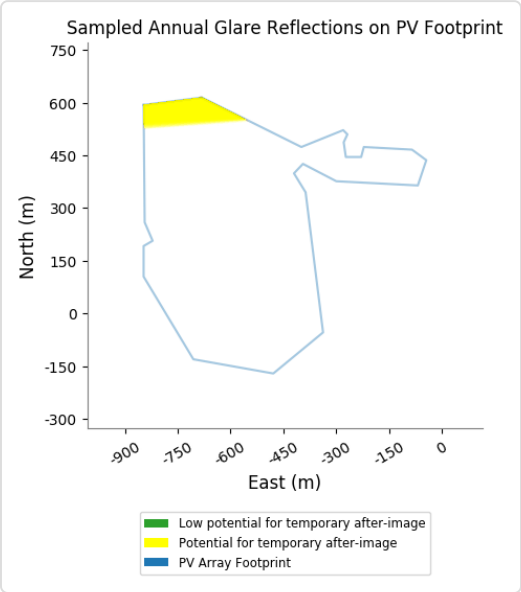
South Array - OP Receptor (OP 10)

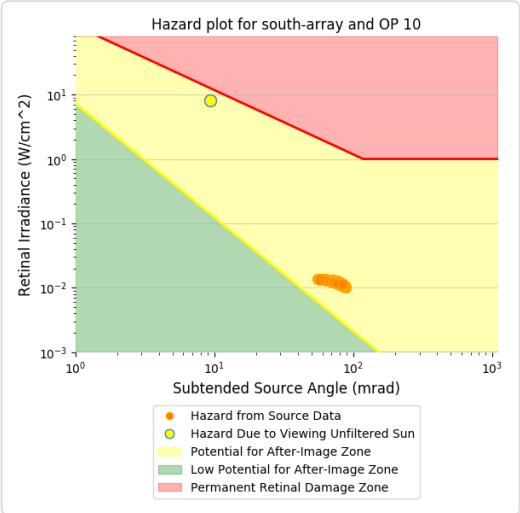
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 610 minutes of "yellow" glare with potential to cause temporary after-image.





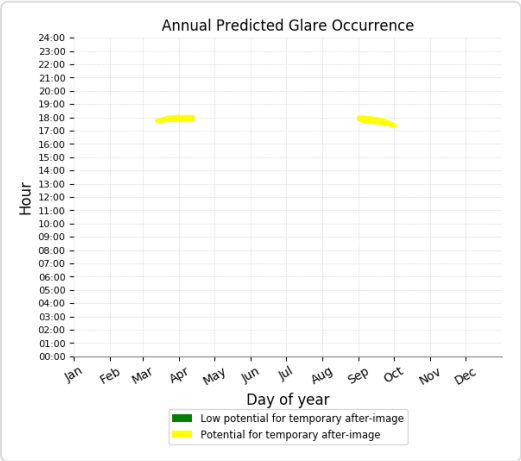


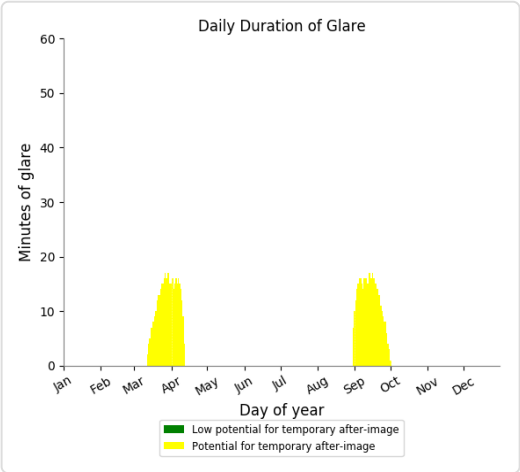


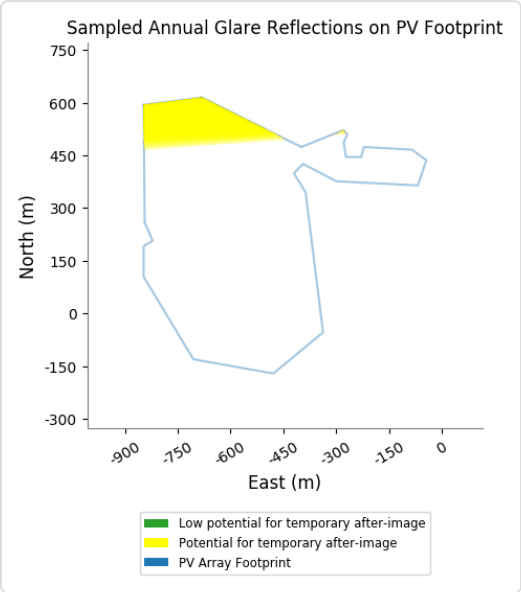
South Array - OP Receptor (OP 11)

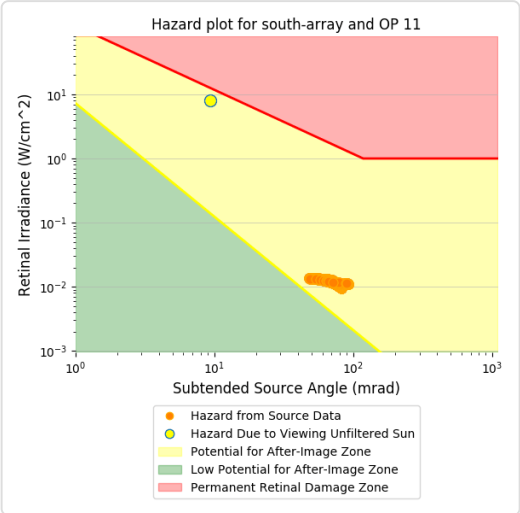
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 788 minutes of "yellow" glare with potential to cause temporary after-image.





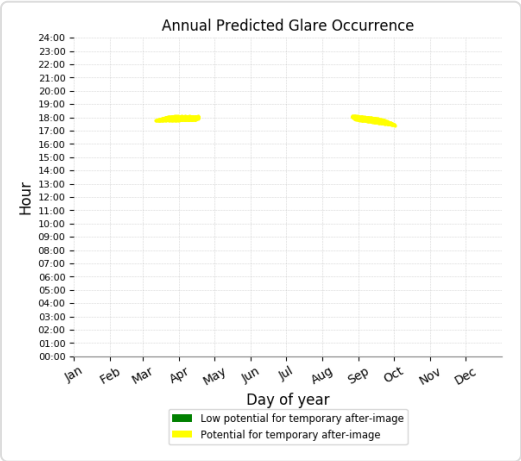


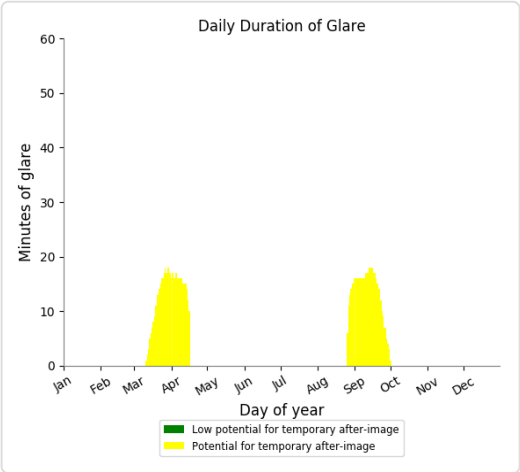


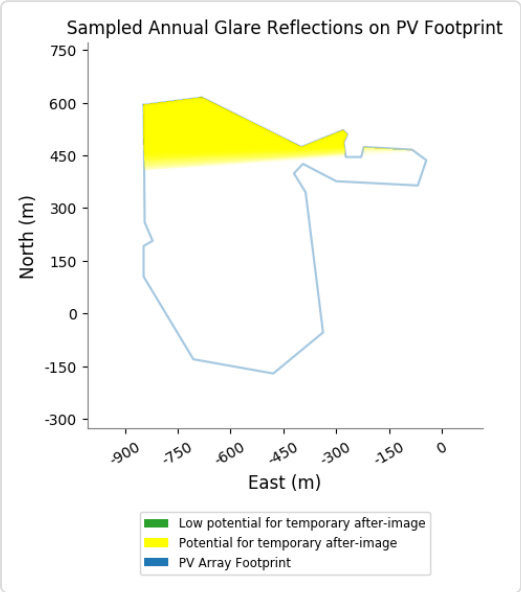
South Array - OP Receptor (OP 12)

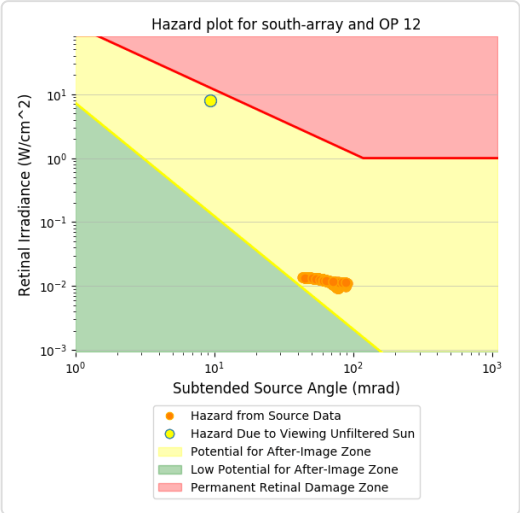
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 979 minutes of "yellow" glare with potential to cause temporary after-image.





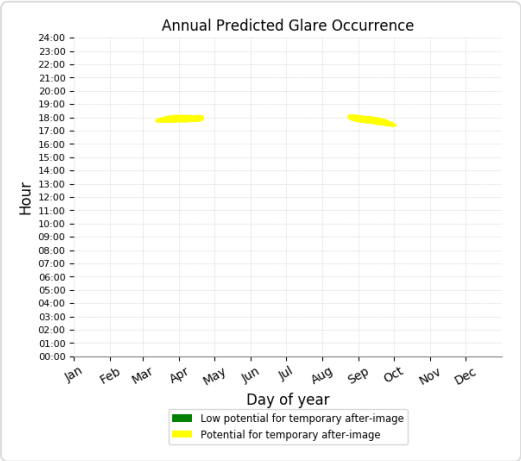


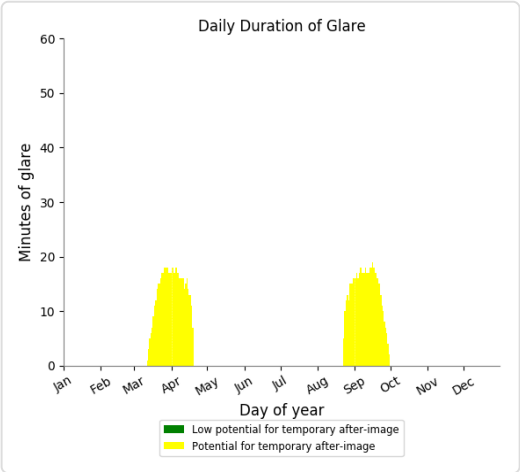


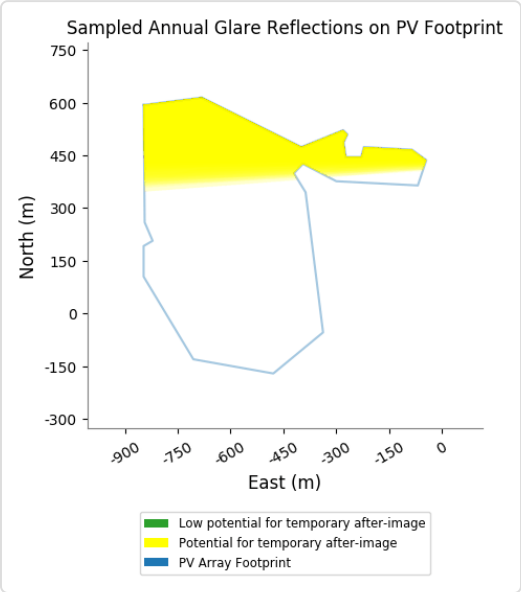
South Array - OP Receptor (OP 13)

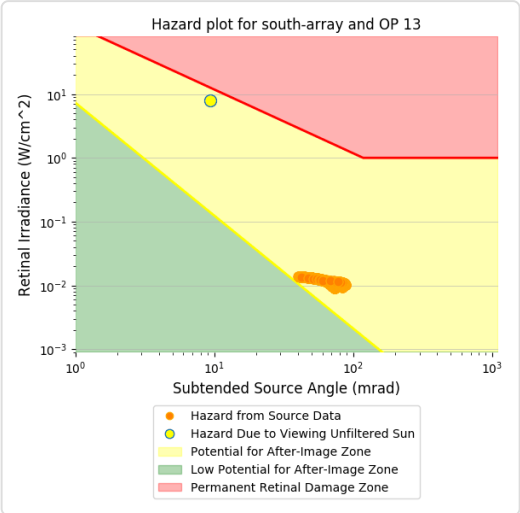
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,089 minutes of "yellow" glare with potential to cause temporary after-image.





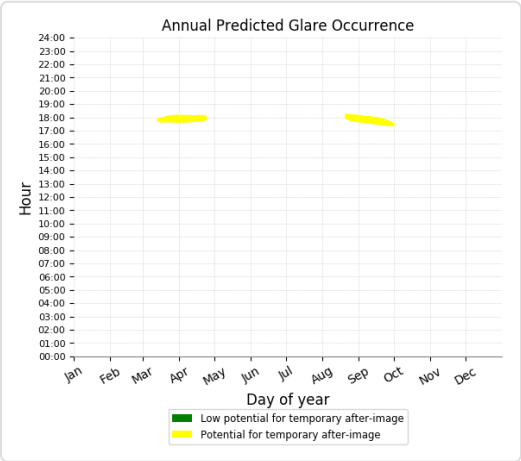


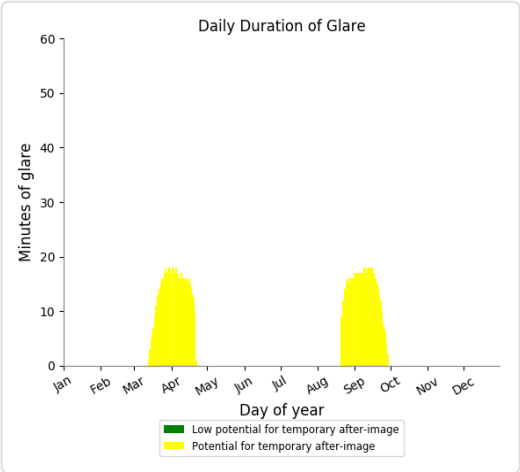


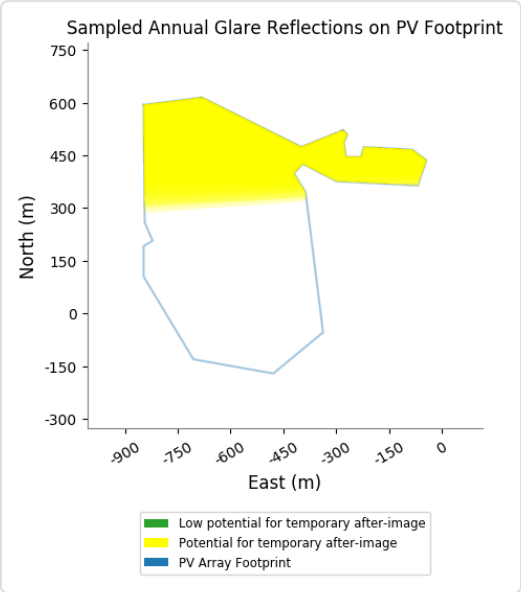
South Array - OP Receptor (OP 14)

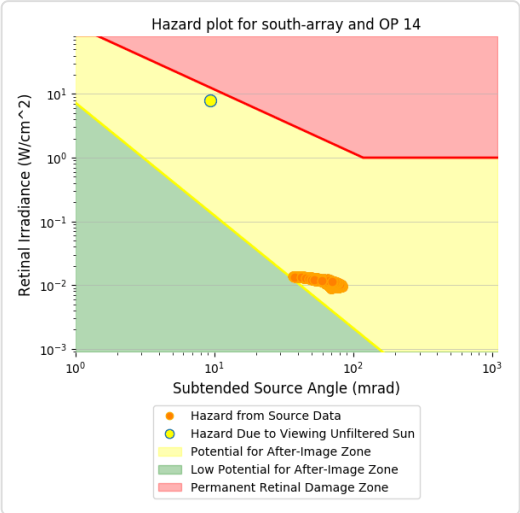
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,143 minutes of "yellow" glare with potential to cause temporary after-image.





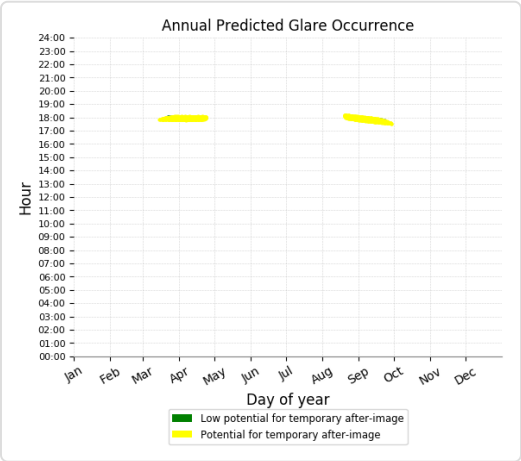


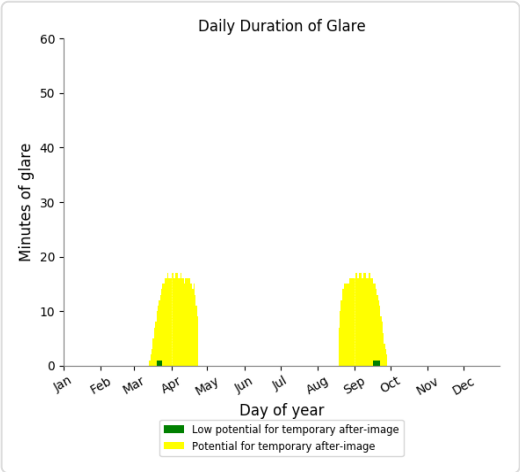


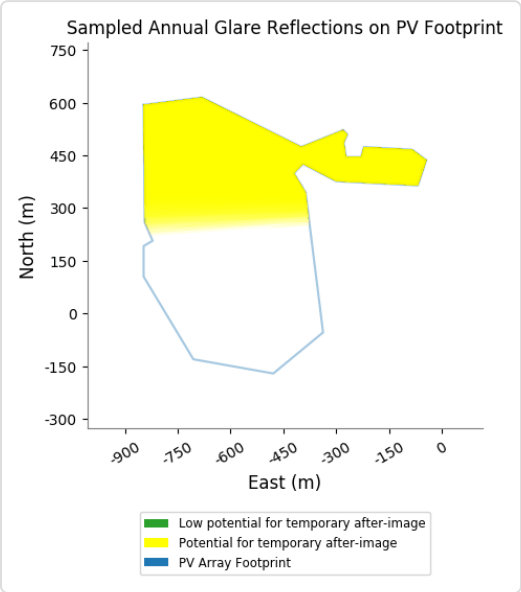
South Array - OP Receptor (OP 15)

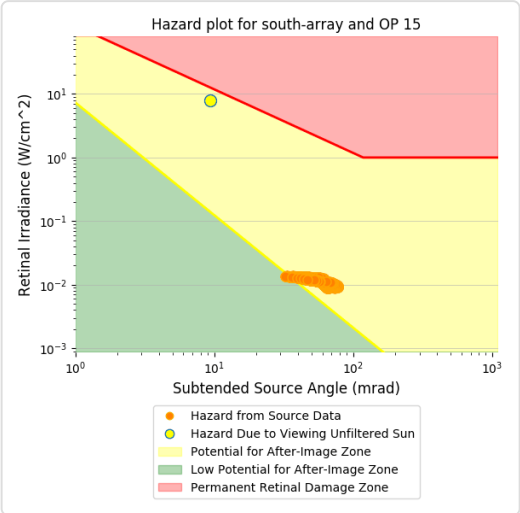
PV array is expected to produce the following glare for receptors at this location:

- 11 minutes of "green" glare with low potential to cause temporary after-image.
- 1,094 minutes of "yellow" glare with potential to cause temporary after-image.





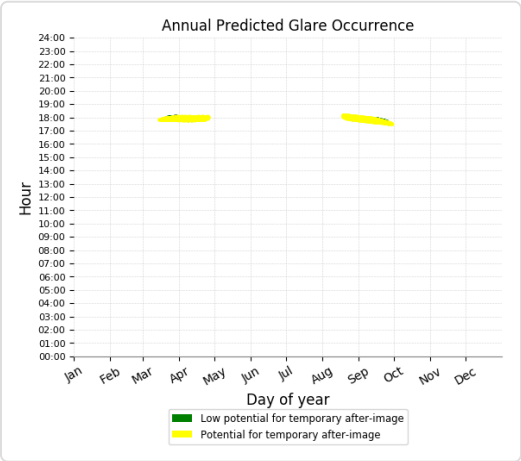


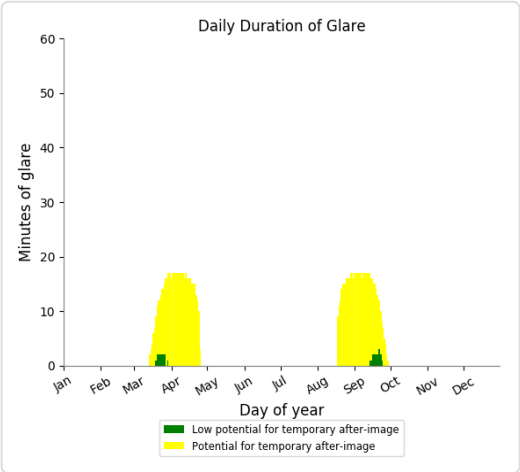


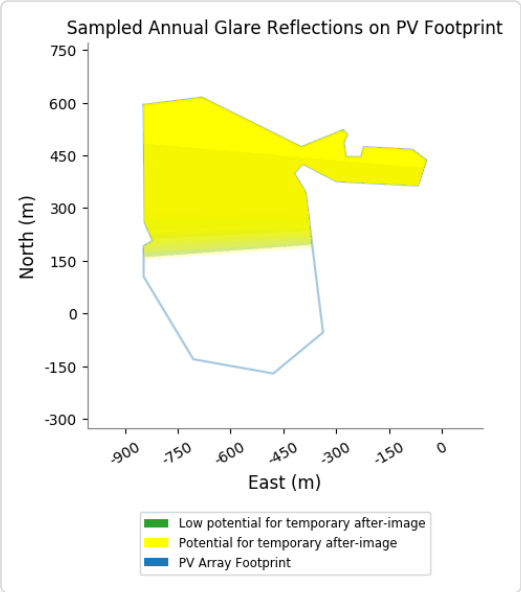
South Array - OP Receptor (OP 16)

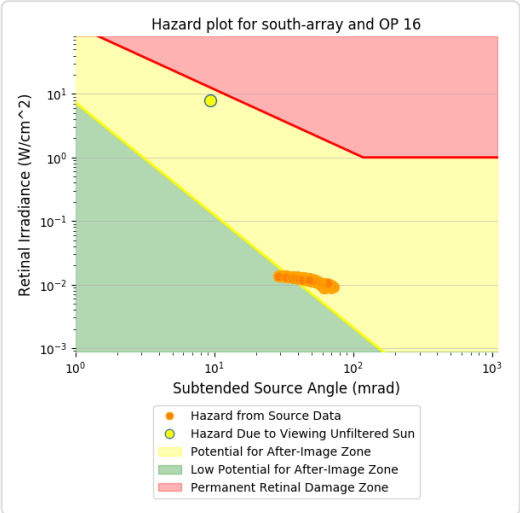
PV array is expected to produce the following glare for receptors at this location:

- 39 minutes of "green" glare with low potential to cause temporary after-image.
- 1,139 minutes of "yellow" glare with potential to cause temporary after-image.





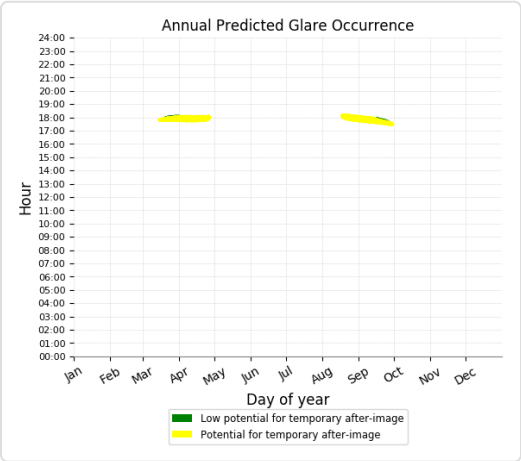


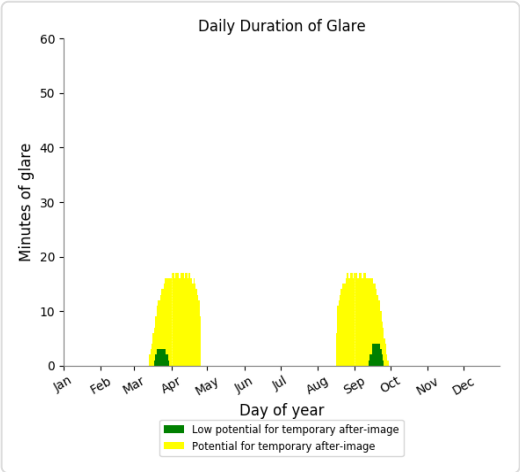


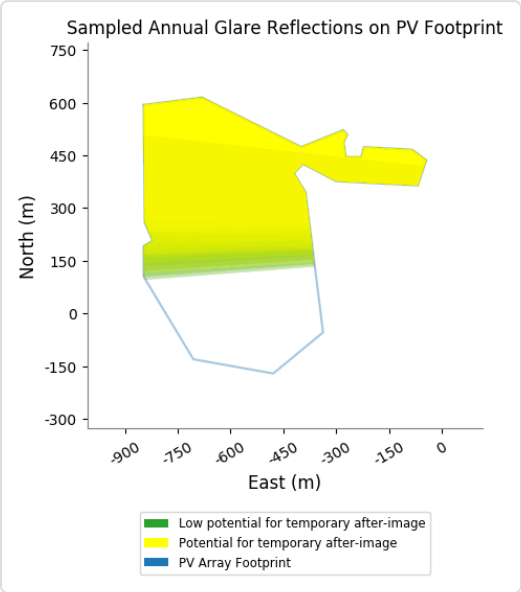
South Array - OP Receptor (OP 17)

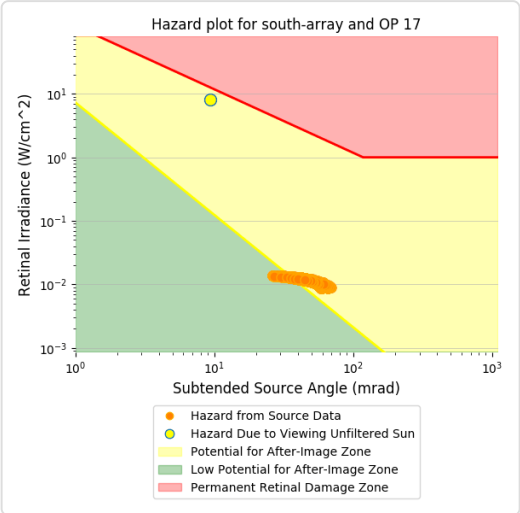
PV array is expected to produce the following glare for receptors at this location:

- 71 minutes of "green" glare with low potential to cause temporary after-image.
- 1,121 minutes of "yellow" glare with potential to cause temporary after-image.









Assumptions

- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
- Detailed system geometry is not rigorously simulated.
- The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values and results may vary.
- The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
- Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results fo large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
- Refer to the **Help page** for detailed assumptions and limitations not listed here.