High River Energy Center

Update to Glint and Glare Analysis – Alternative Layout

1.0 GLARE

1.1 INTRODUCTION

As described in the Supplement to the Application filed on February 14, 2020, following the submission of the Article 10 Application, High River Energy Center, LLC (the Applicant) was able to acquire a lease agreement for an additional land parcel adjacent to the Project Area. The additional property is located on parcel 88.-1-11, an approximately 200-acre parcel located east of Thayer Road and north of Bulls Head Road. An Alternative Layout was prepared utilizing approximately 83.5 acres of this parcel for solar panels, in addition to parcels within the original Project Area.

By adding modules on this parcel, some modules on steeper slopes within the Project Area and the modules in-between Pattersonville Road and Interstate 90 are no longer proposed. The Alternative Layout will reduce impacts to steep slopes and reduce visibility of the Project from the residences along portions of Pattersonville Road, Bulls Head Road and the New York State Thruway.

As concluded in the Applicant's Article 10 Application, the Project is not predicted emit significant glare into the existing environment. Panels are designed to absorb sunlight and will be treated with anti-reflective coatings that will absorb and transmit light rather than reflect it. In general, solar panels are less reflective than window glass or water surfaces (NYSERDA, 2019) and any reflected light from solar panels will have a significantly lower intensity than glare from direct sunlight (Mass. Department of Energy Resources, 2015). The Applicant has prepared this Update to the Glint and Glare Analysis to identify any potential glint/glare impacts on nearby residences and roads based on the Alternative Layout.

The analysis was prepared by Capitol Airspace Group utilizing the Solar Glare Hazard Analysis Tool (SGHAT). The results of the analysis conform to, and are in accordance with, the FAA's interim policy for Solar Energy System Projects on Federally Obligated Airports (78 FR 63271, October 2013), although this policy is only applicable for projects proposing to install solar panels at federally funded airports. SGHAT is a very conservative tool in that:

- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover, and geographic obstructions;
- The glare analysis assumes clear, sunny skies for 365 days of the year and does not take into account meteorological conditions that would nullify predicted glare such as clouds, rain or snow; and,
- Although only a portion of a modeled array may have the potential to produce glare, the results are provided as if the receptor has visibility of the entire array.

The Project proposes to install a combination of both types of racking systems for the Alternative Layout. The glare analysis has been performed based upon the actual racking system types as presented in the site plan drawings included as Attachment A of this Update filing.

1.2 REGULATORY THRESHOLDS

There are no applicable quantitative standards for glare, but scientific literature suggests that doubling the annual 30-hour shadow flicker standard (adopted by the Siting Board applicable to wind facilities) could be used as a benchmark, i.e. 60 hours per year. Additionally, if glint and glare is predicted for a surrounding dwelling for longer than 60 minutes per day, for three or more months of the year, then the impact should be considered significant with respect to residential amenity and, in this scenario, mitigation should be implemented (Pager Power, 2018).

1.3 GLARE ANALYSIS

Based on the viewshed analysis included as Figure 2 'Viewshed Analysis Update for Alternative Layout' in the *Visual Impact Assessment Update for Alternative Layout* included as Attachment C of this Update filing, non-participating residential receptors and points along local roadways (both referred to herein as "observation points") identified as having visibility of the Project were assessed for glare. The overall Alternative Layout proposed array was divided into 35 separate areas identified as arrays A1-1 through A7-9. An additional viewshed analysis was then performed to determine which of these separate 35 array areas are visible from each observation point with predicted visibility. Proposed landscaping was not accounted for in the viewshed analysis and, therefore, the predicted visibility is overestimated.

The analysis conservatively assumes that all residential receptors are from a second story height (16 feet) and road receptors are from a truck height (8 feet) which would result in greater views of the Alternative Layout than single-story and car heights, respectively. Thirty (30) residential observation points and 12 roadway observation points were assessed.

The glare analysis was then conducted to determine the potential duration of glare that could occur at each observation point and to determine the portion of each array area to have a potential to result in glare. The results of this analysis are included in the attached glare report prepared by Capitol Airspace included as Appendix 1 to this analysis and are summarized for each of the 35 assessed arrays in Table 1 below.

Table 1 – Summary of Glare Analysis Results

Array/Racking System Type (Fixed or Tracking)	Glare Potential*
A1-1/Fixed	No glare
A1-2/Fixed	No glare
A1-3/Fixed	No glare
A1-4/Fixed	Green glare** only, <30 hours annually
A1-5/Fixed	Green glare only, <30 hours annually
A1-6/Fixed	Green glare only, <30 hours annually
A1-7/Fixed	Green glare only, <30 hours annually
A1-8/Fixed	Green glare only, <30 hours annually
A1-9/Fixed	Green glare only, <30 hours annually
A1-10/Fixed	No glare
A1-11/Fixed	No glare
A1-12/Fixed	No glare
A2-1/Fixed	Yellow glare**, <60 hours annually
A2-2/Fixed	No glare
A2-3/Fixed	No glare
A2-4/Fixed	No glare
A2-5/Fixed	Yellow glare, <30 hours annually
A2-6/Fixed	Yellow glare, <30 hours annually
A2-7/Fixed	Yellow glare, <60 hours annually
A3-1/Tracking	No glare
A3-2/Fixed	Yellow glare, <60 hours annually
A3-3/Tracking	No glare
A3-4/Fixed	Yellow glare, <60 hours annually

A4-1/Fixed	No glare
A5-1/Fixed	Glare, potential for >60 hours annually
A6-1/Fixed	No glare
A7-1/Fixed	Yellow glare, <30 hours annually
A7-2/Fixed	Green glare only, <30 hours annually
A7-3/Fixed	Green glare only, <30 hours annually
A7-4/Fixed	Green glare only, <30 hours annually
A7-5/Fixed	Green glare only, <30 hours annually
A7-6/Fixed	No glare
A7-7/Fixed	Green glare only, <30 hours annually
A7-8/Fixed	No glare
A7-9/Fixed	Green glare only, <30 hours annually

**Indicates maximum glare potential identified for observation points assessed for each array; refer to SGHAT PV Array Results tables entitled 'PV & Receptor Analysis Results' for each array in Appendix 1.*

***Glare identified as 'Green' in SGHAT has a low potential for temporary after-image glare. Glare identified as 'Yellow' glare in SGHAT has the potential for temporary after-image glare. Glare identified as 'Red' glare in SGHAT has the potential for permanent eye damage glare. There is no potential for 'Red' glare as a result of the Project*.

As indicated in Table 1 above, all arrays but one (A5-1) have the potential for glare less than 60 hours of annually. As indicated in Section 1.3.1 below, it was determined that the one observation point (OP-29) with this potential for glare can be mitigated by screening with a landscape buffer. Furthermore, 30 of the 35 arrays assessed have either no potential for glare or the potential for glare less than 30 hours (1,800 minutes) annually.

The results of the analysis also indicate that there is no predicted glare at observation point OP-47, the property located at 859 Bulls Head Road, Amsterdam, NY 12010.

1.3.1 Areas with Potential for Greater Than 60 Hours Annually

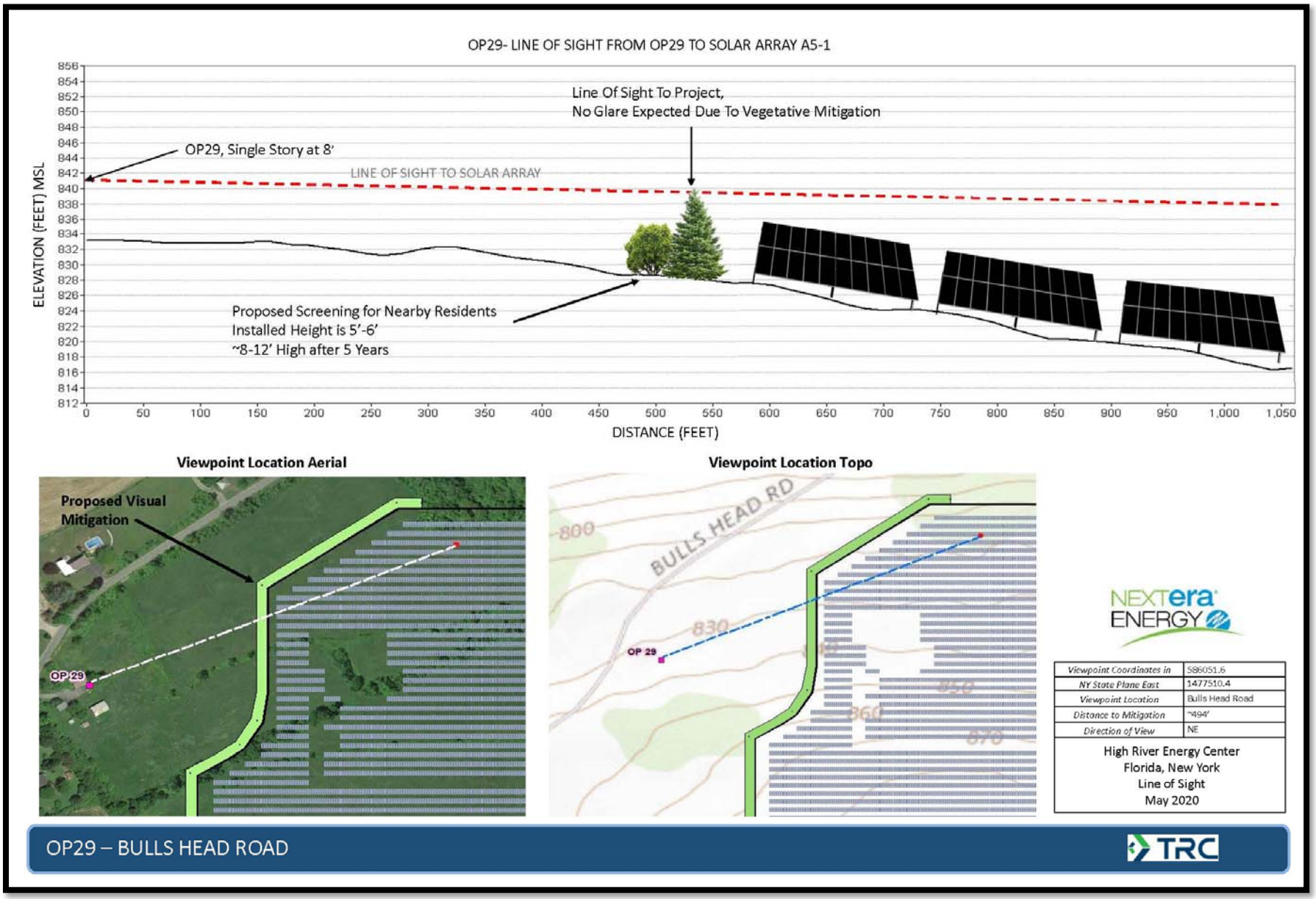
The following provides further analysis on Array A5-1 where there is the potential for glare greater than 60 hours annually. Three residential and one roadway observation points with predicted visibility of Array A5-1 were assessed for glare. Only observation point OP-29 resulted in the potential for glare greater than 60 hours annually. While the results indicated there is the potential for glare greater than 60 hours annually, further analysis was required to determine if the portion of Array A5-1 determined to have this potential is actually visible at observation point OP-29. Because an area may show visibility in the viewshed analysis, it does not mean the entirety of the array area will be seen. The viewshed analysis depicts areas of visibility over a regional area. It can only predict geographically on a map areas where some part of the solar panels might be seen. It does not and cannot determine if it is seeing a full on view or a partial view. Additionally, if visibility is occurring in an area, it may sometimes only be a result of glimpsing a portion of the Project over undulating treetops between gaps of trees, or visibility of the tops of panels and not a full view. Finally, the viewshed analysis also did not account for proposed visual mitigation in the form of a landscape buffer. Landscaping is proposed between observation point OP-29 and Array A5-1 to screen views from this receptor.

Therefore, a separate line of sight analysis was completed to confirm visibility of the portion of Array A5-1 with the potential to result in glare to OP-29. The residence at OP-29 is a ranch (single-story dwelling) and is located approximately 515 feet from the portion of the array with the potential to result in glare as depicted in Figure 1 below.

Figure 1 – Observation Point OP-29

As indicated in Figure 2 below, the line of sight analysis confirms that the portion of the array with the potential to result in glare is not visible from OP-29 due to the proposed landscape buffer and existing topography. Accordingly, there is no potential for glare at OP-29.

Figure 2


OP29- LINE OF SIGHT FROM OP29 TO SOLAR ARRAY A5-1
ELEVATION (FEET) MSL
DISTANCE (FEET)
Line Of Sight To Project,
No Glare Expected Due To Vegetative Mitigation
OP29, Single Story at 8'
LINE OF SIGHT TO SOLAR ARRAY
Proposed Screening for Nearby Residents
Installed Height is 5'-6'
~8-12' High after 5 Years
Viewpoint Location Aerial
Proposed Visual Mitigation
OP 29
Viewpoint Location Topo
BULLS HEAD RD
OP 29
Viewpoint Coordinates in | 586051.6
NY State Plane East | 1477510.4
Viewpoint Location | Bulls Head Road
Distance to Mitigation | ~494'
Direction of View | NE
High River Energy Center
Florida, New York
Line of Sight
May 2020
OP29 – BULLS HEAD ROAD

1.3.2 Areas with Potential for Greater Than 30 Hours and Less Than 60 Hours Annually

Seven of the 35 arrays assessed were determined to have the potential for glare for greater than 30 hours and less than 60 hours annually. Table 2 provides a summary of each of these array areas and the observation points assessed along with an indication of the predicted duration of potential glare.

Table 2 – Glare Potential >30 Hours but <60 Hours Annually

Array	Observation Point	Type	Glare Potential Annually	Potential Glare Duration*
A2-1	OP-21	Residence	3,393 minutes (56.6 hours)	<20 minutes daily possible from mid-March to October at approximately 6:00 AM
A2-1	OP-54	Residence	2,986 minutes (49.8 hours)	<20 minutes daily possible from mid-March to October at approximately 6:00 AM
A2-3	OP-54	Residence	1,966 minutes (32.8 hours)	<15 minutes daily possible from mid-March to mid-September at approximately 6:00 AM
A2-3	OP-66	Road	2,525 minutes (42.1 hours)	<20 minutes daily possible from mid-March to mid-September at approximately 6:00 AM
A2-6	OP-56	Residence	2,707 minutes (45.1 hours)	<15 minutes daily possible from mid-March to October at approximately 5:30 PM
A2-7	OP-7	Residence	2,277 minutes (38.0 hours)	<15 minutes daily possible from mid-March to October at approximately 6:00 PM

Array	Observation Point	Type	Glare Potential Annually	Potential Glare Duration*
A3-2	OP-14	Residence	2,559 minutes (42.7 hours)	<20 minutes daily possible from April to September at approximately 6:00 PM
A3-2	OP-15	Residence	2,272 minutes (37.9 hours)	<20 minutes daily possible from April to September at approximately 6:00 PM
A3-2	OP-67	Road	1,909 minutes (31.8 hours)	<20 minutes daily possible from mid-April to mid-August at approximately 6:00 PM
A3-2	OP-69	Road	2,043 minutes (34.0 hours)	<20 minutes daily possible from mid-April to mid-August at approximately 6:00 PM
A3-4	OP-10	Residence	2,636 minutes (43.9 hours)	<20 minutes daily possilbe from mid-March to mid-September at approximately 6:00 PM
A3-4	OP-11	Residence	2,684 minutes (44.7 hours)	<20 minutes daily from mid-March to mid-September at approximately 6:00 PM
A5-1	OP-28	Residence	2,179 minutes (36.3 hours)	<25 minutes daily from March to May and August to September at approximately 6:00 AM
A5-1	OP-72	Road	2,518 minutes (42.0 hours)	<25 minutes daily from March to May and August to September at approximately 6:00 AM

* *Potential for glare analysis assumes clear, sunny skies for 365 days of the year and does not take into account meteorological conditions that would nullify predicted glare such as clouds, rain or snow. Therefore, potential for glare is overestimated*.

As indicated in Table 2 above, there are no instances of predicted glare for longer than 60 minutes per day for three or more months. Additionally, there are no instances of glare for greater than 60 hours annually. Accordingly, there is no significant glare impacts as a result of the Project. Most instances of potential glare for these observation points are for less than 20 minutes during the summer months either near the time of sunrise or sunset when the sun is low in the sky and glare from the sun itself is most prevalent. Additionally, the SGHAT model assumes clear, sunny skies for 365 days of the year and therefore the results are overestimated.

1.3.3 Areas with Potential for Less Than 30 Hours or No Glare

Thirty (30) of the 35 arrays assessed have either no potential for glare or the potential for glare less than 30 hours (1,800 minutes) annually. Accordingly, the remaining observation points assessed either have no predicted glare or less than 30 hours annually with the maximum duration of potential glare ranging from 5 to 20 minutes per day during select summer months.

1.4 VISUAL MITIGATION

As a conservative measure, in order to further reduce any potential impacts as a result of glare, visual mitigation in the form of landscape screening is proposed as follows:

- Landscaping along westernmost portions of Array A-2
- Special Planting Area proposed along southernmost portion of Array A-2
- Landscaping along southernmost portion of Array A-3
- Landscaping along northern and western perimeter of Array A-5
- Special Planting Area proposed along northern and western portions of Array A-7

1.5 CONCLUSION

Based on the results of the analysis and the proposed mitigation measures, no significant impacts from glare are expected as a result of the Project. Predicted impacts have been minimized to the maximum extent practicable.

Refer to Appendix 1 to see the Glint and Glare report and associated SGHAT data sheets prepared by Capitol Airspace Group.

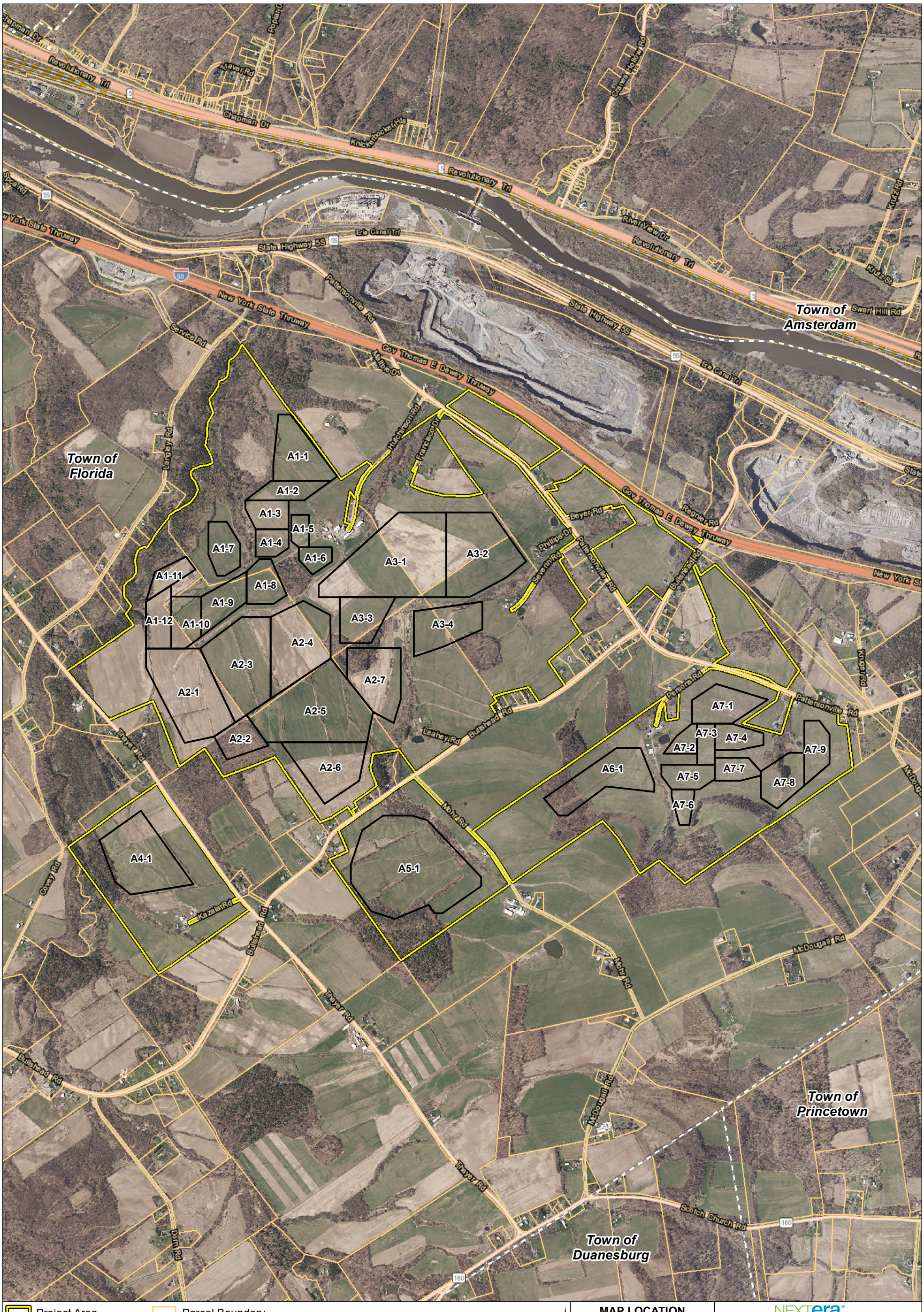
References:

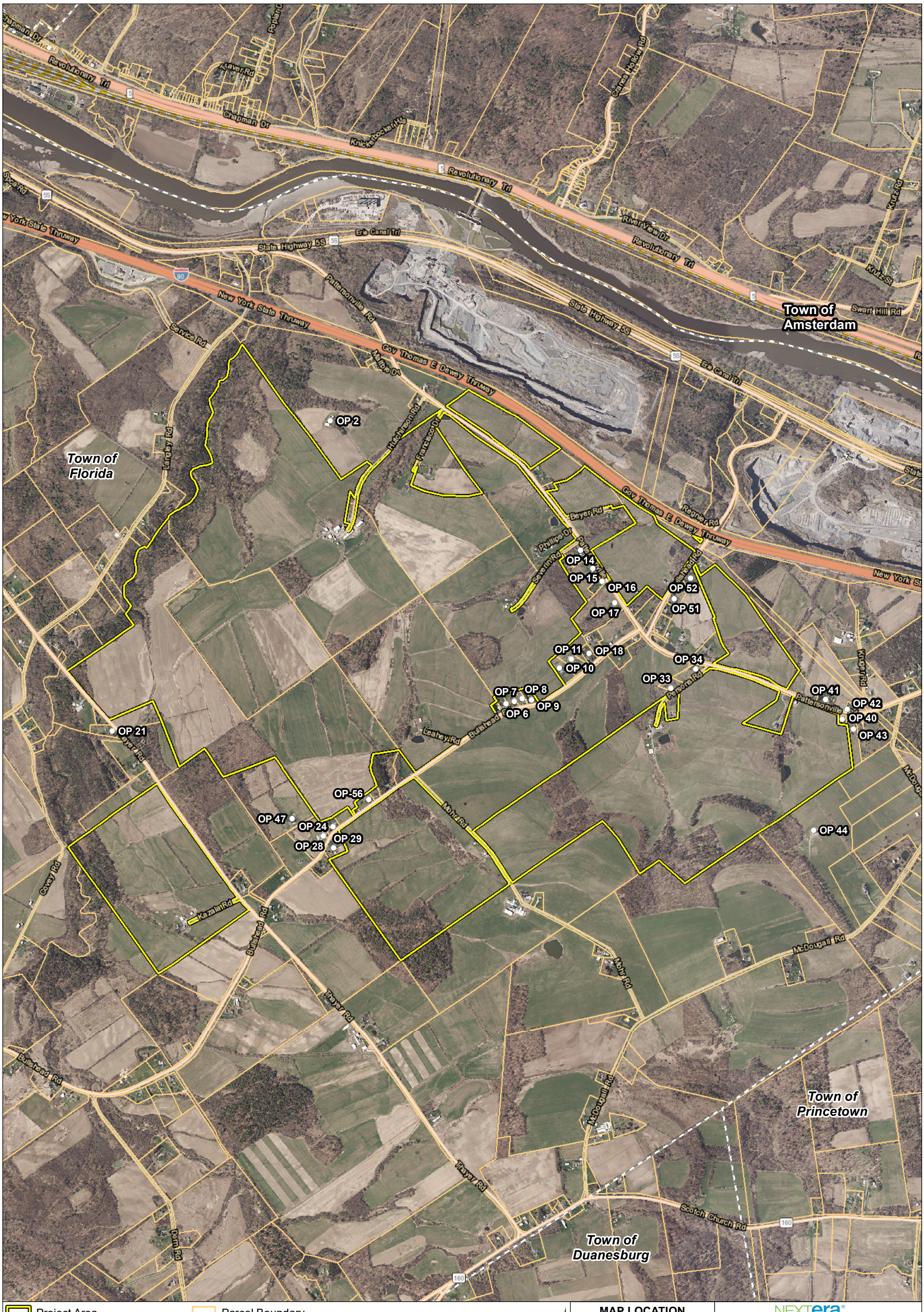
Massachusetts Department of Energy Resources. "Clean Energy Results, Questions and Answers, Ground Mounted Solar Photovoltaic Systems." Energy Center, June 2015.

http://www.mass.gov/eea/docs/doer/renewables/solar/solar-pv-guide.pdf

NYSERDA. New York Solar Guidebook for Local Governments. January 2019. Available at: https://www.nyserda.ny.gov/All%20Programs/Programs/Clean%20Energy%20Siting/Solar%20Guidebook

Pager Power, *Solar Photovoltaic Development – Glint Glare Guidance*, October, 2018 Second Edition


Revolutionary Trl
Chapman Dr
Knickerbocker Hts
Poplar Dr
Xavier Rd
Gages Hollow Rd
Kruz Rd
River View Dr
Kruz St
Erie Canal Trl
State Highway 5S
New York State Thruway
Service Rd
Pattersonville Rd
Gov Thomas E Dewey Thruway
Swart Hill Rd
Town of Amsterdam
Mallow Dr
Langley Rd
Hutchinson Rd
Francesco Dr
Town of Florida
A1-1
A1-2
A1-3
A1-4
A1-5
A1-6
A1-7
A1-8
A1-9
A1-10
A1-11
A1-12
A2-1
A2-2
A2-3
A2-4
A2-5
A2-6
A2-7
A3-1
A3-2
A3-3
A3-4
A4-1
A5-1
A6-1
A7-1
A7-2
A7-3
A7-4
A7-5
A7-6
A7-7
A7-8
A7-9
Beyer Rd
Regner Rd
Phillips Dr
Sovernn Rd
Bullshead Rd
Kruger Rd
Persons Rd
Leahey Rd
Thayer Rd
Mohr Rd
McDougall Rd
Covey Rd
Kazala Rd
Dunn Rd
Scotch Church Rd
160
Town of Princetown
Town of Duanesburg
Project Area
Assessed Array Areas
Parcel Boundary
Municipal Boundary
N
0
1,500
Feet
Base Map: Base Map: NYS Office of Information Technology Services, GIS Program Office, 2018
MAP LOCATION
New York
NEXTera ENERGY RESOURCES
GLINT AND GLARE ANALYSIS
ARRAY AREAS
HIGH RIVER ENERGY CENTER, LLC
TOWN OF FLORIDA, NY
FIGURE 3
MAY 2020
Map Produced by TRC



Project Area
Residential Observation Point
Parcel Boundary
Municipal Boundary

N

0 1,500 Feet

Base Map: Base Map: NYS Office of Information Technology Services, GIS Program Office, 2018

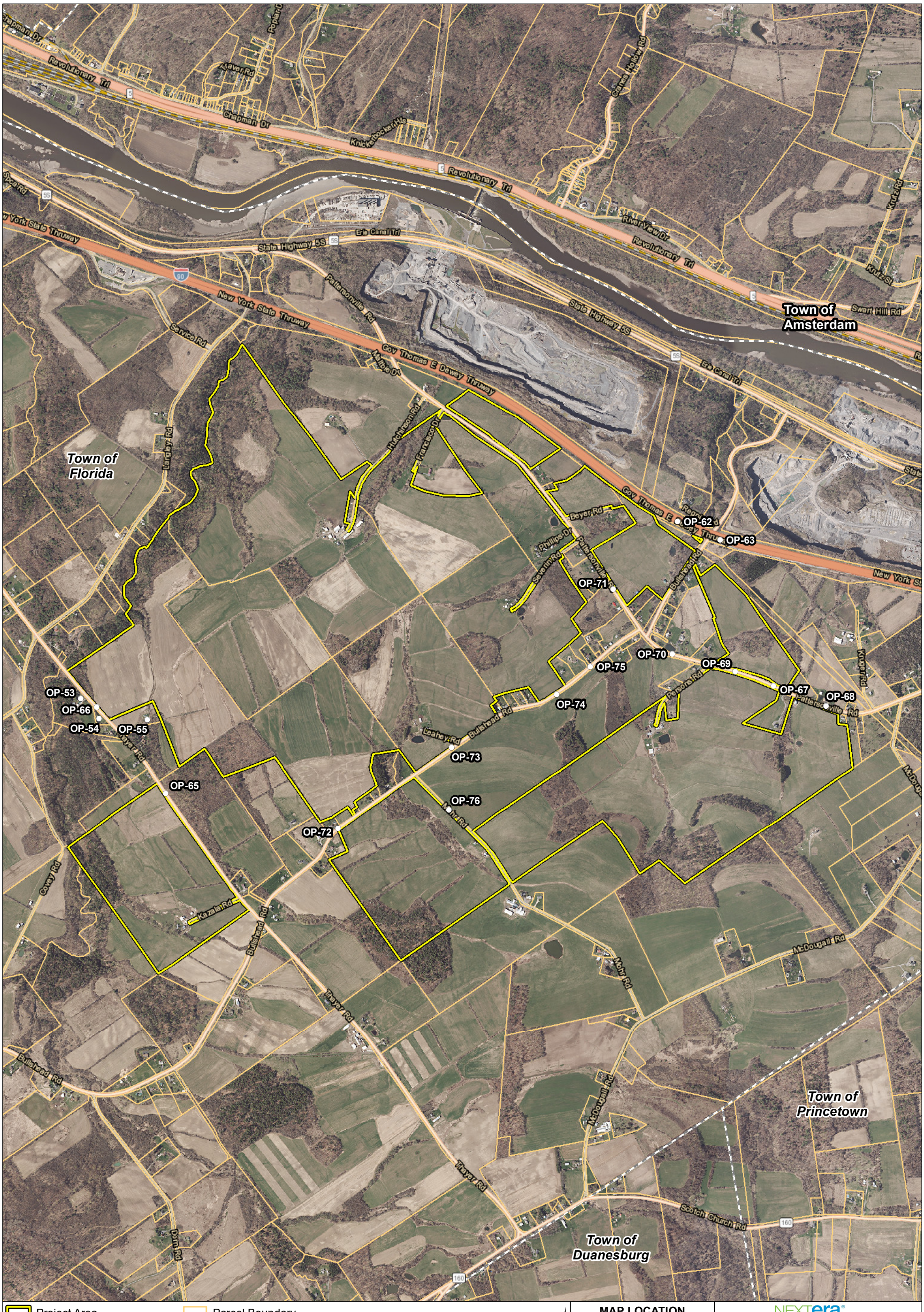
MAP LOCATION

NEXTera ENERGY RESOURCES

GLINT AND GLARE ANALYSIS
RESIDENTIAL OBSERVATION POINTS
HIGH RIVER ENERGY CENTER, LLC
TOWN OF FLORIDA, NY

FIGURE 4	MAY 2020

Map Produced by TRC



Project Area
Roadway Observation Point
Parcel Boundary
Municipal Boundary

N

0 1,500 Feet

Base Map: Base Map: NYS Office of Information Technology Services, GIS Program Office, 2018

MAP LOCATION

NEXTera ENERGY RESOURCES

GLINT AND GLARE ANALYSIS
ROADWAY OBSERVATION POINTS
HIGH RIVER ENERGY CENTER, LLC
TOWN OF FLORIDA, NY

FIGURE 5	MAY 2020

Map Produced by TRC

Appendix 1

Glint and Glare Report by Capitol Airspace Group

High River Energy Center

NextEra Energy Resources, LLC

Montgomery County, New York

Glint & Glare Analysis

May 20, 2020

Capitol Airspace Group

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Table of Contents

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Summary

NextEra Energy Resources, LLC is proposing to construct solar arrays near the town of Florida in Montgomery County, New York (***Figure 1***). On behalf of NextEra Energy Resources, LLC, Capitol Airspace performed a Glint and Glare Analysis utilizing the Solar Glare Hazard Analysis Tool (SGHAT) in order to identify the potential for glare impacts. Specifically, this analysis considered the potential for glare impacts on the second story of nearby residences and specific observation points for large truck on roadways not shielded from the proposed solar arrays by existing obstructions.

The SGHAT predicted green and yellow glare for the second story of nearby residences and for observation points of trucks on roadways as a result of the proposed NextEra Energy Resources, LLC solar arrays.

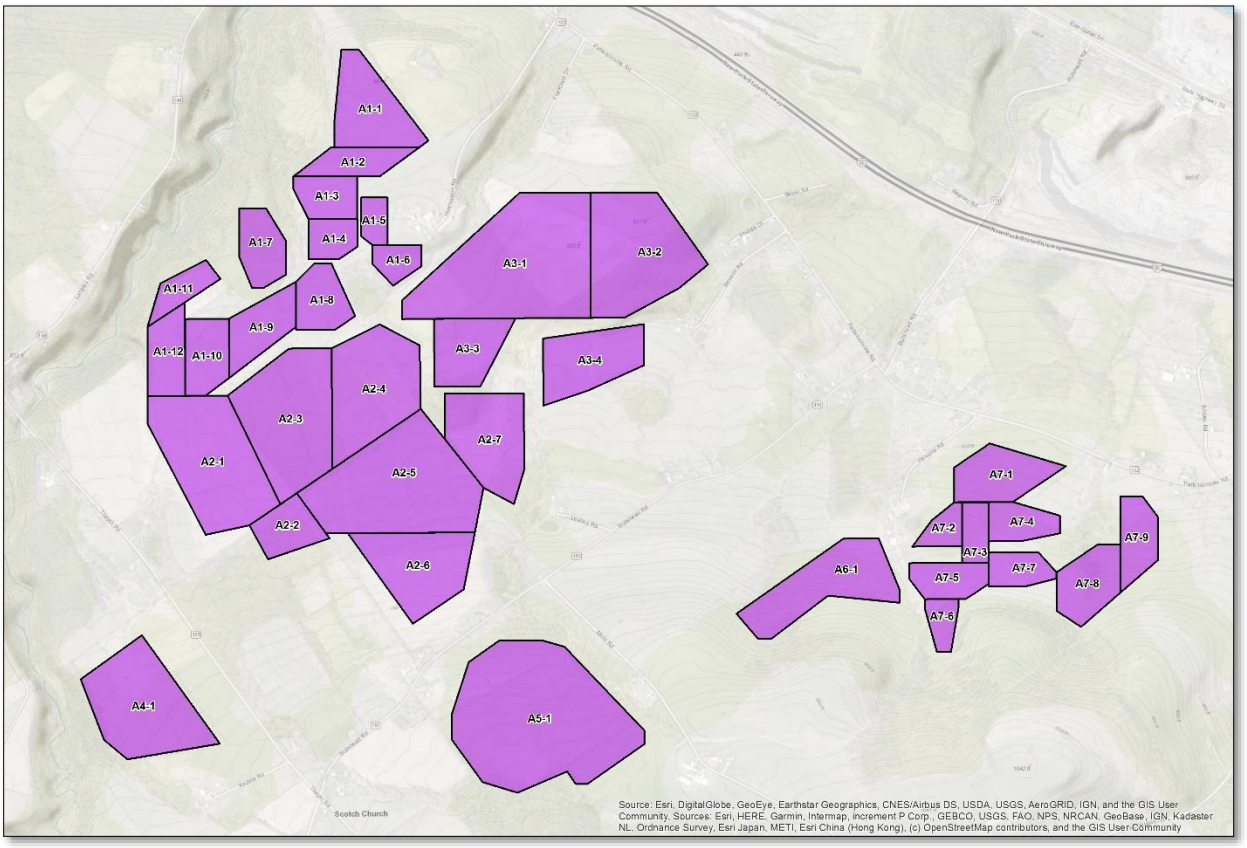

Figure 1: Location of High River Energy Center

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Methodology

In cooperation with the Department of Energy (DOE), the Federal Aviation Administration (FAA) developed and validated the Sandia National Laboratories "*Solar Glare Hazard Analysis Tool*" (SGHAT), now licensed through ForgeSolar. The FAA requires the use of the SGHAT in order to enhance safety by providing standards for measuring the ocular impact of proposed solar energy systems on pilots and air traffic controllers. ForgeSolar has enhanced the SGHAT for glare hazard analysis beyond the aviation environment. These enhancements include a route module for analyzing roadways as well as an observation point module for analyzing residences. Currently, there are no defined standards for acceptable ocular impact on residences.

The SGHAT analyses potential for glare over the entire calendar year in one-minute intervals from when the sun rises above the horizon until the sun sets below the horizon. The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values may differ. The SGHAT does not account for physical obstructions between reflectors and receptors.

Capitol Airspace utilized the SGHAT based guidance provided in User's Manual v.3. Solar array specifications were provided by High River Energy Center, LLC. Since the SGHAT does not account for physical obstructions between reflectors and receptors, High River Solar Energy Center, LLC, provided residences and road points to be analyzed based on three-dimensional viewshed analysis of the project area. Two of the arrays, A1-2 and A2-2, did not include any residence or road points for analysis based on the provided viewshed analysis of the project area. As a result of the three-dimensional viewshed analysis provided, this analysis only considered the potential for glare impact on second story of residences and trucks on roadways not shielded from the proposed solar arrays by existing obstructions.

Data

Solar Arrays

Parameter	Value
Axis tracking:	Fixed (no rotation)
Orientation:	180.0°
Tilt:	25.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 1: High River Energy Center Array Inputs for All Fixed Arrays

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.908169	-74.151932	552.81	10	562.81
2	42.90534	-74.149041	572.89	10	582.89
3	42.905134	-74.149433	571.08	10	581.08
4	42.905145	-74.153009	544.96	10	554.96
5	42.905921	-74.153005	539.53	10	549.53
6	42.908171	-74.152675	541.88	10	551.88

Table 2: High River Energy Center Array A1-1 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.905134	-74.149433	571.08	10	581.08
2	42.90425	-74.151114	570.75	10	580.75
3	42.904261	-74.154758	540.84	10	550.84
4	42.905145	-74.153168	542.37	10	552.37

Table 3: High River Energy Center Array A1-2 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.904253	-74.152065	567.11	10	577.11
2	42.902933	-74.152073	599.68	10	609.68
3	42.902939	-74.154131	590.38	10	600.38
4	42.903873	-74.15476	563.75	10	573.75
5	42.904261	-74.154758	540.84	10	550.84

Table 4: High River Energy Center Array A1-3 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.902933	-74.152073	599.68	10	609.68
2	42.902079	-74.152077	601.29	10	611.29
3	42.901693	-74.152872	601.33	10	611.33
4	42.901697	-74.154138	589.1	10	599.1
5	42.902939	-74.154131	590.38	10	600.38

Table 5: High River Energy Center Array A1-4 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.903586	-74.150799	595.27	10	605.27
2	42.902111	-74.150807	604.68	10	614.68
3	42.902113	-74.151441	603.85	10	613.85
4	42.902389	-74.151915	601.79	10	611.8
5	42.903589	-74.151908	585	10	595

Table 6: High River Energy Center Array A1-5 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.902106	-74.149383	601.08	10	611.08
2	42.90145	-74.149387	591.38	10	601.38
3	42.900859	-74.150604	598.31	10	608.32
4	42.901534	-74.151445	603.19	10	613.19
5	42.902113	-74.151441	603.85	10	613.85

Table 7: High River Energy Center Array A1-6 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.903291	-74.155914	573.93	10	583.93
2	42.902267	-74.155086	587.93	10	597.93
3	42.901234	-74.155092	600.02	10	610.02
4	42.900823	-74.156069	603.89	10	613.89
5	42.900825	-74.156534	607.65	10	617.65
6	42.901784	-74.157062	600.99	10	610.99
7	42.903294	-74.157053	553.46	10	563.46

Table 8: High River Energy Center Array A1-7 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.901575	-74.15319	600.68	10	610.68
2	42.899925	-74.15221	599.46	10	609.46
3	42.89952	-74.153042	599.58	10	609.58
4	42.899525	-74.154702	603.3	10	613.3
5	42.901006	-74.154694	599.36	10	609.36
6	42.901577	-74.153901	594.27	10	604.27

Table 9: High River Energy Center Array A1-8 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.899619	-74.154702	602.97	10	612.97
2	42.898057	-74.157537	612.76	10	622.76
3	42.89988	-74.157527	606.65	10	616.65
4	42.901006	-74.154694	599.36	10	609.36

Table 10: High River Energy Center Array A1-9 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.89988	-74.157527	606.65	10	616.65
2	42.898057	-74.157537	612.76	10	622.76
3	42.897509	-74.158533	619.48	10	629.48
4	42.897511	-74.159393	622.15	10	632.15
5	42.899885	-74.15938	609.44	10	619.44

Table 11: High River Energy Center Array A1-10 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.901709	-74.158463	590.77	10	600.77
2	42.901118	-74.157864	606.92	10	616.92
3	42.899657	-74.160964	607.39	10	617.39
4	42.901006	-74.160397	594.69	10	604.69

Table 12: High River Energy Center Array A1-11 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.900405	-74.159377	609.42	10	619.42
2	42.897511	-74.159393	622.15	10	632.15
3	42.897516	-74.160976	619.02	10	629.02
4	42.899657	-74.160964	607.39	10	617.39

Table 13: High River Energy Center Array A1-12 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.900405	-74.159377	609.42	10	619.42
2	42.897511	-74.159393	622.15	10	632.15
3	42.897516	-74.160976	619.02	10	629.02
4	42.899657	-74.160964	607.39	10	617.39

Table 14: High River Energy Center Array A2-1 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.894468	-74.15474	662.19	10	672.19
2	42.893054	-74.153385	691.36	10	701.36
3	42.892427	-74.155979	692.18	10	702.18
4	42.893487	-74.156748	670.07	10	680.07

Table 15: High River Energy Center Array A2-2 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.898941	-74.155011	606.32	10	616.32
2	42.898935	-74.153214	599.13	10	609.13
3	42.895203	-74.153235	646.52	10	656.52
4	42.894126	-74.155439	668.52	10	678.52
5	42.897506	-74.157616	616.69	10	626.69

Table 16: High River Energy Center Array A2-3 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.899663	-74.151175	595.99	10	605.99
2	42.899002	-74.149502	597.63	10	607.63
3	42.897032	-74.149489	625.14	10	635.14
4	42.895203	-74.153235	646.52	10	656.52
5	42.898935	-74.153214	599.13	10	609.13

Table 17: High River Energy Center Array A2-4 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.897032	-74.149489	625.14	10	635.14
2	42.89457	-74.146882	679.71	10	689.71
3	42.893192	-74.147266	707.19	10	717.19
4	42.893211	-74.153536	688.46	10	698.46
5	42.894468	-74.15474	662.19	10	672.19

Table 18: High River Energy Center Array A2-5 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.893192	-74.147266	707.19	10	717.19
2	42.891435	-74.147755	747.54	10	757.54
3	42.890388	-74.149912	766.14	10	776.14
4	42.893209	-74.152615	689.16	10	699.16

Table 19: High River Energy Center Array A2-6 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.897501	-74.148473	619.64	10	629.64
2	42.897491	-74.145147	617.08	10	627.09
3	42.895126	-74.145161	661.58	10	671.58
4	42.894061	-74.145602	684.46	10	694.46
5	42.89457	-74.146882	679.71	10	689.71
6	42.89608	-74.148481	645.5	10	655.5

Table 20: High River Energy Center Array A2-7 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.903667	-74.139447	602.74	10	612.74
2	42.901419	-74.137325	536.16	10	546.16
3	42.900681	-74.138569	556.7	10	566.7
4	42.899794	-74.140855	589.65	10	599.65
5	42.899799	-74.14229	594.51	10	604.51
6	42.903676	-74.142268	602.26	10	612.26

Table 21: High River Energy Center Array A3-2 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.899593	-74.140051	574.28	10	584.28
2	42.898322	-74.140059	599.94	10	609.94
3	42.897553	-74.14244	610.45	10	620.45
4	42.897098	-74.144323	621.33	10	631.33
5	42.89917	-74.144311	593.15	10	603.15

Table 22: High River Energy Center Array A3-4 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.890112	-74.161322	711.28	10	721.28
2	42.886731	-74.158086	777.38	10	787.38
3	42.886278	-74.161988	741.64	10	751.64
4	42.886885	-74.162962	730.01	10	740.01
5	42.888771	-74.163918	716.13	10	726.13

Table 23: High River Energy Center Array A4-1 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.889843	-74.146265	787.34	10	797.34
2	42.889838	-74.144498	796.06	10	806.06
3	42.889624	-74.143544	803.44	10	813.44
4	42.887007	-74.140208	920.86	10	930.86
5	42.886594	-74.14021	926.95	10	936.95
6	42.885374	-74.142628	912.08	10	922.08
7	42.885376	-74.14312	909.18	10	919.18
8	42.88576	-74.143476	902.24	10	912.24
9	42.885119	-74.145577	896.33	10	906.33
10	42.885465	-74.147049	887.69	10	897.69
11	42.886771	-74.1483	870.2	10	880.2
12	42.887599	-74.148296	857.62	10	867.62
13	42.889178	-74.147575	818.86	10	828.86

Table 24: High River Energy Center Array A5-1 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.892883	-74.131755	687.39	10	697.39
2	42.892878	-74.130269	681.83	10	691.83
3	42.891285	-74.129407	728.63	10	738.63
4	42.890877	-74.129427	746.77	10	756.77
5	42.891124	-74.132423	756.72	10	766.72
6	42.88981	-74.134827	818.28	10	828.28
7	42.889812	-74.135389	822.49	10	832.49
8	42.890591	-74.13629	799.34	10	809.34

Table 25: High River Energy Center Array A6-1 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.895783	-74.125547	599.46	10	609.46
2	42.895058	-74.122344	607.42	10	617.42
3	42.893963	-74.124601	647.04	10	657.04
4	42.893971	-74.127063	664.87	10	674.87
5	42.895051	-74.127057	620.77	10	630.77

Table 26: High River Energy Center Array A7-1 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.89397	-74.126746	663.88	10	673.89
2	42.892608	-74.126755	696.03	10	706.03
3	42.892614	-74.128851	690.27	10	700.27
4	42.893423	-74.128017	675.17	10	685.17
5	42.893971	-74.127063	664.87	10	674.87

Table 27: High River Energy Center Array A7-2 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.893966	-74.125639	657.5	10	667.5
2	42.892096	-74.12565	719.43	10	729.44
3	42.8921	-74.126758	727.32	10	737.32
4	42.89397	-74.126746	663.88	10	673.89

Table 28: High River Energy Center Array A7-3 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.893963	-74.124601	647.04	10	657.04
2	42.893526	-74.122631	638.47	10	648.47
3	42.892982	-74.122634	651.26	10	661.26
4	42.892755	-74.12422	673.03	10	683.03
5	42.892759	-74.125646	687.51	10	697.51
6	42.893966	-74.125639	657.5	10	667.5

Table 29: High River Energy Center Array A7-4 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.892096	-74.12565	719.43	10	729.44
2	42.89144	-74.125654	749.63	10	759.63
3	42.890977	-74.126607	772.54	10	782.54
4	42.890983	-74.128349	746.13	10	756.13
5	42.891606	-74.128979	725.33	10	735.33
6	42.892107	-74.128976	711.99	10	721.99

Table 30: High River Energy Center Array A7-5 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.890978	-74.126925	769.88	10	779.88
2	42.890745	-74.126926	779.37	10	789.37
3	42.889349	-74.12727	816.01	10	826.01
4	42.889351	-74.127871	808.6	10	818.6
5	42.890672	-74.128351	752.13	10	762.13
6	42.890983	-74.128349	746.13	10	756.13

Table 31: High River Energy Center Array A7-6 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.8924	-74.123558	683.87	10	693.87
2	42.891776	-74.122798	703.17	10	713.17
3	42.891583	-74.122799	712	10	722
4	42.891357	-74.12407	738.51	10	748.51
5	42.891362	-74.125655	754.23	10	764.23
6	42.892407	-74.125648	705.63	10	715.63

Table 32: High River Energy Center Array A7-7 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.892624	-74.12105	659.82	10	669.82
2	42.892621	-74.120101	663.95	10	673.95
3	42.891122	-74.120111	724.92	10	734.93
4	42.890073	-74.121789	760.73	10	770.73
5	42.890576	-74.122805	760.06	10	770.06
6	42.891776	-74.122798	703.17	10	713.17

Table 33: High River Energy Center Array A7-8 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.894093	-74.119143	622.23	10	632.23
2	42.89347	-74.118513	644.16	10	654.16
3	42.892115	-74.118522	679.79	10	689.79
4	42.891122	-74.120111	724.92	10	734.93
5	42.894096	-74.120092	620.14	10	630.14

Table 34: High River Energy Center Array A7-9 Vertices

Parameter	Value
Axis tracking	Single
Tracking axis orientation	180.0°
Tracking axis tilt	0.0°
Max tracking angle	60.0
Resting angle	5.0
Panel material	Smooth glass with AR coating
Reflectivity	Vary with sun
Slope error	Correlate with material

Table 35: High River Energy Center Array Inputs for All Tracking Arrays

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.899823	-74.150234	593.55	13	606.55
2	42.900392	-74.15023	590.49	13	603.49
3	42.903685	-74.145236	596.28	13	609.28
4	42.903676	-74.142268	602.26	13	615.26
5	42.899799	-74.14229	594.51	13	607.51
6	42.899808	-74.14526	596.69	13	609.69

Table 36: High River Energy Center Array A3-1 Vertices

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	42.899809	-74.14545	597	13	610
2	42.897719	-74.146963	616.78	13	629.78
3	42.897725	-74.148908	613.72	13	626.72
4	42.899819	-74.148896	595.2	13	608.2

Table 37: High River Energy Center Array A3-3 Vertices

High River Energy Center Discrete Observation Points - Residences

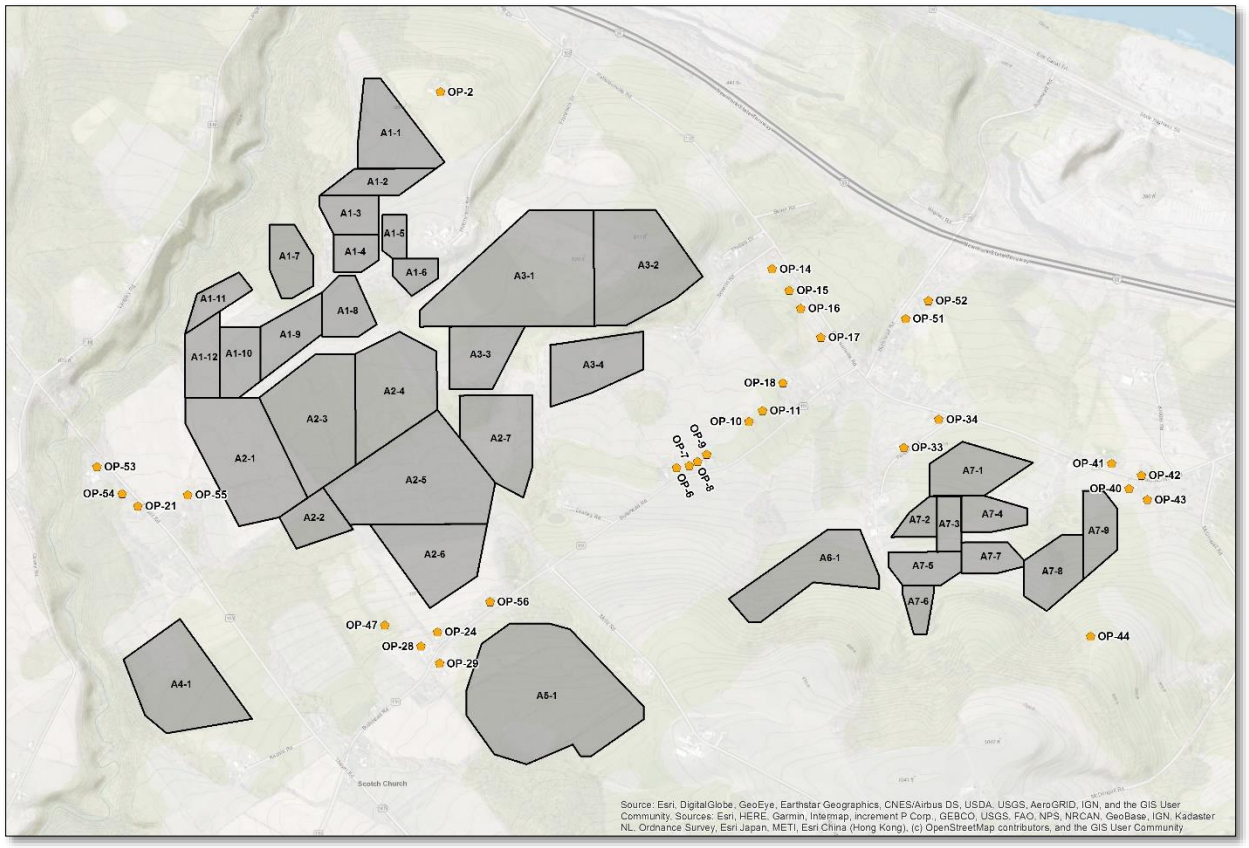


Figure 2: Location of High River Energy Center Arrays Discrete Observation Points - Residences

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground - Single Story (feet)	Total Elevation - Single Story
2	42.907694	-74.149199	572.15	16	588.15
6	42.895017	-74.138592	654.06	16	670.06
7	42.89508	-74.138024	656.8	16	672.8
8	42.895209	-74.137643	652.41	16	668.41
9	42.895449	-74.137219	645.29	16	661.29
10	42.896538	-74.135272	617.58	16	633.58
11	42.896899	-74.134649	608.28	16	624.28
14	42.901646	-74.134145	520.64	16	536.64
15	42.900923	-74.133373	528.42	16	544.42
16	42.90031	-74.132858	535.27	16	551.27
17	42.899332	-74.131956	546.15	16	562.15
18	42.897823	-74.133705	597.13	16	613.13
21	42.893908	-74.163184	668.48	16	684.48
24	42.889587	-74.149577	803.08	16	819.08

28	42.889113	-74.150335	815.49	16	831.49
29	42.88853	-74.1495	829.78	16	845.78
33	42.895612	-74.128218	603.85	16	619.85
34	42.896544	-74.126614	577.97	16	593.97
40	42.894156	-74.117976	629.26	16	645.26
41	42.895003	-74.118754	615.36	16	631.36
42	42.894598	-74.117405	624.86	16	640.86
43	42.893775	-74.117145	644.07	16	660.07
44	42.889212	-74.119802	856.43	16	872.43
47	42.889832	-74.151972	774.9	16	790.9
51	42.899927	-74.128083	496.14	16	512.14
52	42.900524	-74.127042	491.1	16	507.1
53	42.8952395	-74.16502698	640.71906	16	656.71906
54	42.89433148	-74.16390015	658.45227	16	674.45227
55	42.89426665	-74.16089733	654.57886	16	670.57886
56	42.890581	-74.147171	771.93451	16	787.93451

Table 38: High River Energy Center Arrays Discrete Observation Receptors - Residences

High River Energy Center Discrete Observation Points - Routes

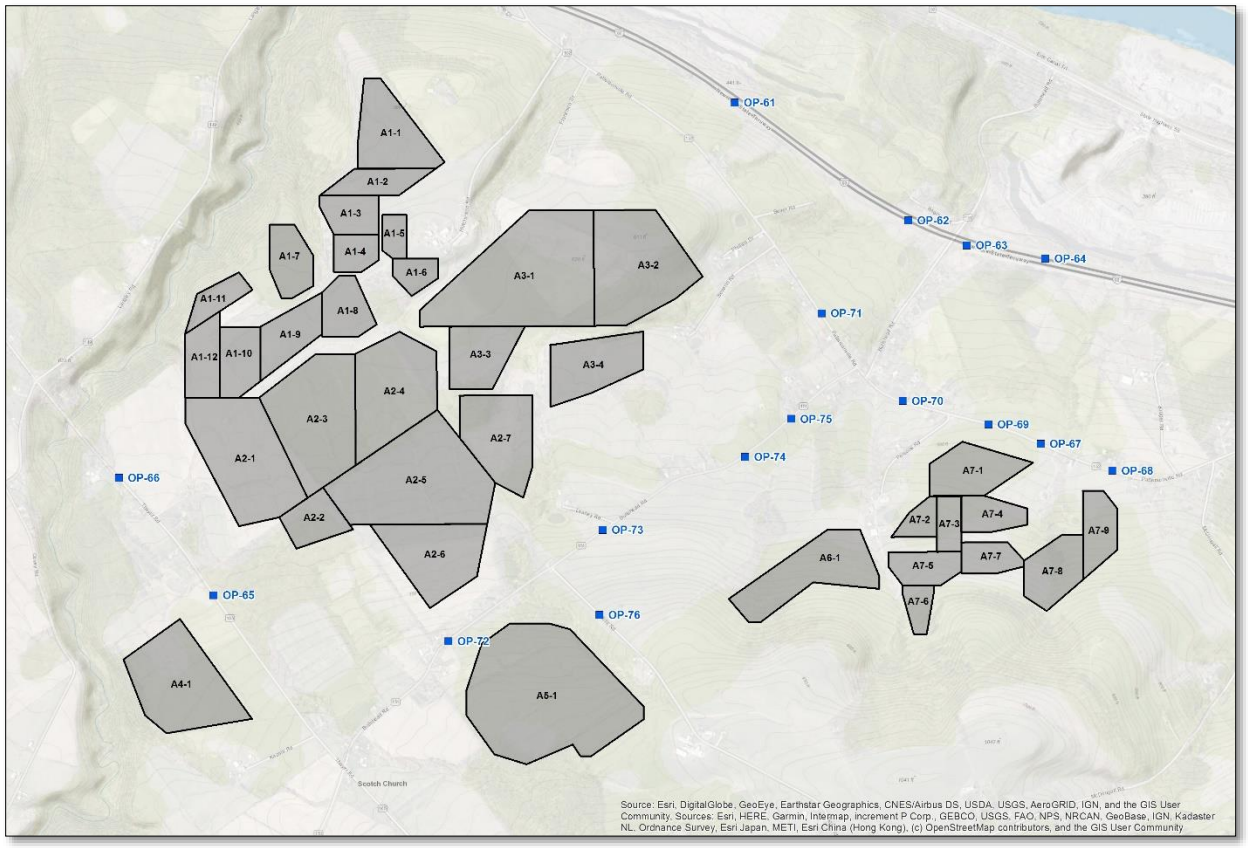


Figure 3: Location of High River Energy Center Arrays Discrete Observation Points – Routes

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars
61	42.90723127	-74.13577836	459.55774	8	467.55774
62	42.90321669	-74.12791441	453.07245	8	461.07245
63	42.90236749	-74.12526347	458.59235	8	466.59235
64	42.90189453	-74.12168551	455.46283	8	463.46283
65	42.89088908	-74.15976975	704.65399	8	712.65399
66	42.8948536	-74.1640407	650.53223	8	658.53223
67	42.8956824	-74.12197924	595.87189	8	603.87189
68	42.89475876	-74.11872707	613.31	8	621.31
69	42.89635433	-74.12436023	586.98694	8	594.98694
70	42.89717137	-74.12825496	549.02765	8	557.02765
71	42.90013756	-74.13191311	532.71948	8	540.71948
72	42.88926373	-74.14908221	812.47101	8	820.47101
73	42.89294731	-74.14199429	719.21368	8	727.21368
74	42.89534882	-74.13546446	631.04553	8	639.04553
75	42.89660423	-74.1333501	593.70453	8	601.70453
76	42.89009601	-74.14219048	830.17462	8	838.17462

Table 39: Arrays Observation Receptors Routes

Results

Capitol Airspace utilized the above specified inputs to analyze potential glint and glare at various points along roadways and nearby residences.

If glare is detected, "Glare Occurrence Plots" are generated by SGHAT. The plots show when glare can occur (as viewed from the prescribed observation point) throughout the year. The color indicates the potential ocular hazard. The colors are defined as:

- Green: Low potential for temporary after-image glare
- Yellow: Potential for temporary after-image glare
- Red: Potential for permanent eye damage glare

The results of this analysis predicted glare for the second story residence and truck receptors (*Table 40*).

Array	Receptor	Green Glare (minutes / year)	Yellow Glare (minutes / year)	Red Glare (minutes / year)
A1-1	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A1-1	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A1-2	Residences Two Story	*N/A*	*N/A*	*N/A*
	Truck Observation	*N/A*	*N/A*	*N/A*
A1-3	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A1-4	Residences Two Story	1867	0	0
	Truck Observation	0	0	0
A1-5	Residences Two Story	854	0	0
	Truck Observation		0	0
A1-6	Residences Two Story	2346	0	0
	Truck Observation	0	0	0
A1-7	Residences Two Story	137	0	0
	Truck Observation	0	0	0
A1-8	Residences Two Story	341	0	0
	Truck Observation	0	0	0
A1-9	Residences Two Story	932	0	0
	Truck Observation	0	0	0
A1-10	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A1-11	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A1-12	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A2-1	Residences Two Story	0	6379	0
	Truck Observation	0	1691	0

A2-2	Residences Two Story	*N/A*	*N/A*	*N/A*
	Truck Observation	*N/A*	*N/A*	*N/A*
A2-3	Residences Two Story	0	3290	0
	Truck Observation	0	2525	0
A2-4	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A2-5	Residences Two Story	107	82	0
	Truck Observation	0	2608	0
A2-6	Residences Two Story	0	2876	0
	Truck Observation	0	0	0
A2-7	Residences Two Story	1319	2277	0
	Truck Observation	12	146	0
A3-1	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A3-2	Residences Two Story	678	10408	0
	Truck Observation	0	3952	0
A3-3	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A3-4	Residences Two Story	1609	7197	0
	Truck Observation	0	0	0
A4-1	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A5-1	Residences Two Story	0	9817	0
	Truck Observation	0	2518	0
A6-1	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A7-1	Residences Two Story	4	1743	0
	Truck Observation	0	19	0
A7-2	Residences Two Story	10	0	0
	Truck Observation	0	0	0
A7-3	Residences Two Story	190	14	0
	Truck Observation	0	0	0
A7-4	Residences Two Story	23	34	0
	Truck Observation	0	0	0
A7-5	Residences Two Story	0	657	0
	Truck Observation	0	0	0
A7-6	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A7-7	Residences Two Story	0	58	0
	Truck Observation	0	0	0
A7-8	Residences Two Story	0	0	0
	Truck Observation	0	0	0
A7-9	Residences Two Story	0	1982	0
	Truck Observation	0	0	0

Table 40: High River Energy Center Glint and Glare Summary

Conclusion

Glare modeling results concluded that glare was predicted for NextEra Energy Resources, LLC provided observation points for residences with an estimated second story viewing height of 16 feet as a result of the project. Additionally, there was also predicted glare from the solar arrays for NextEra Energy Resources, LLC provided observation points for large trucks with an estimated viewing height of 8 feet. Capitol Airspace has applied FAA's glint and glare standards to vehicular operations due to the absence of non-aviation regulatory guidelines.

However, it should be noted that the glint and glare analysis is a two-dimensional model that does not take into account vegetation, fencing, terrain, or other natural obstructions. The SGHAT receptors were combined with a three-dimensional viewshed analysis conducted by NextEra Energy Resources, LLC to reduce residences and roadways from the analysis. This glint and glare report takes the most conservative approach in calculating the possibility for glint and glare.

If you have any questions regarding the findings in this analysis, please contact ***Rick Coles*** at (703) 256-2485.

GlareGauge Glare Analysis Results

Site Configuration: Array 1-1 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 6:30 p.m.**
Updated **May 13, 2020 1:50 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39193.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 1	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A1 1
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.908169	-74.151932	552.81	10.00	562.81
2	42.905340	-74.149041	572.89	10.00	582.89
3	42.905134	-74.149433	571.08	10.00	581.08
4	42.905145	-74.153009	544.96	10.00	554.96
5	42.905921	-74.153005	539.53	10.00	549.53
6	42.908171	-74.152675	541.88	10.00	551.88

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 73	42.892947	-74.141994	719.25	8.00	727.25
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 1	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 1 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 47	0	0
OP: OP 73	0	0
OP: OP 76	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-2 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 6:30 p.m.**
Updated **May 12, 2020 6:30 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39194.5043

No results yet - submit a glare analysis using the editor to see glare results

Component Data

PV Array(s)

Name: A1 2
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.905134	-74.149433	571.08	10.00	581.08
2	42.904250	-74.151114	570.75	10.00	580.75
3	42.904261	-74.154758	540.84	10.00	550.84
4	42.905145	-74.153168	542.37	10.00	552.37

Summary of PV Glare Analysis PV configuration and predicted glare

PV & Receptor Analysis Results detailed results for each PV array and receptor

No PV Array Results

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-3 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 6:30 p.m.**
Updated **May 13, 2020 1:55 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39195.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 3	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A1 3
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.904253	-74.152065	567.11	10.00	577.11
2	42.902933	-74.152073	599.68	10.00	609.68
3	42.902939	-74.154131	590.38	10.00	600.38
4	42.903873	-74.154760	563.75	10.00	573.75
5	42.904261	-74.154758	540.84	10.00	550.84

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 2	42.907694	-74.149199	572.18	16.00	588.18
OP 7	42.895080	-74.138024	656.83	16.00	672.83
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 3	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 3 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 2	0	0
OP: OP 7	0	0
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 44	0	0
OP: OP 47	0	0
OP: OP 76	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-4 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 6:30 p.m.**
Updated **May 13, 2020 1:57 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39196.5043

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

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 4	25.0	180.0	1,867	0	-

Component Data

PV Array(s)

Name: A1 4
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.902933	-74.152073	599.68	10.00	609.68
2	42.902079	-74.152077	601.29	10.00	611.29
3	42.901693	-74.152872	601.33	10.00	611.33
4	42.901697	-74.154138	589.10	10.00	599.10
5	42.902939	-74.154131	590.38	10.00	600.38

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 2	42.907694	-74.149199	572.18	16.00	588.18
OP 7	42.895080	-74.138024	656.83	16.00	672.83
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 21	42.893908	-74.163184	668.51	16.00	684.51
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 4	25.0	180.0	1,867	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 4 low potential for temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 2	0	0
OP: OP 7	0	0
OP: OP 10	670	0
OP: OP 11	777	0
OP: OP 21	0	0
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 40	236	0
OP: OP 43	175	0
OP: OP 44	9	0
OP: OP 47	0	0

A1 4 - OP Receptor (OP 2)

No glare found

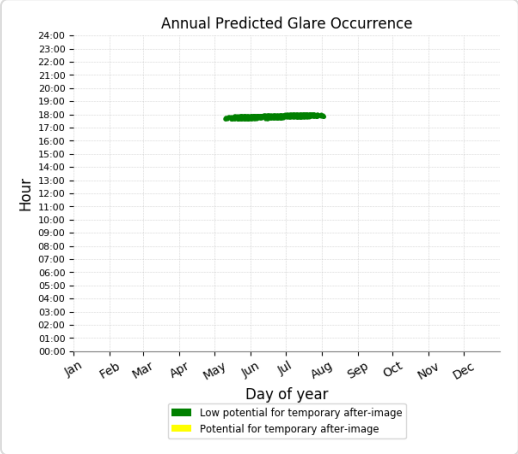
A1 4 - OP Receptor (OP 7)

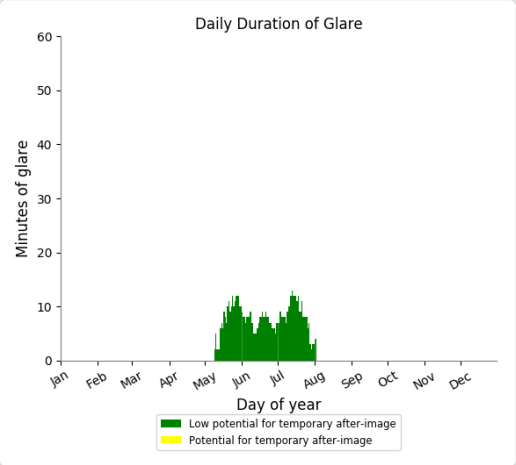
No glare found

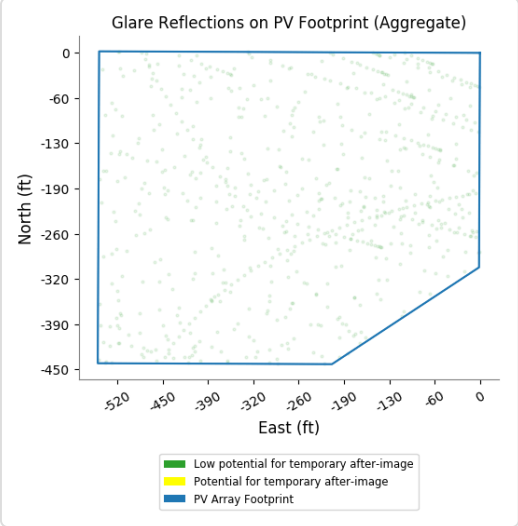
A1 4 - OP Receptor (OP 10)

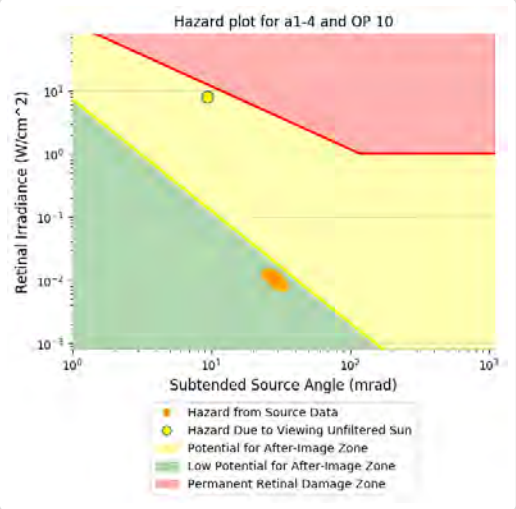
PV array is expected to produce the following glare for receptors at this location:

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





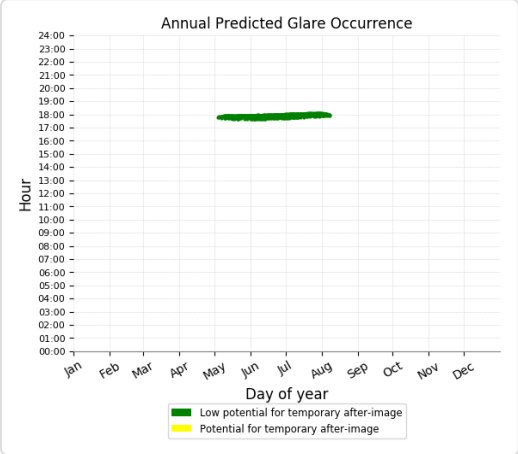


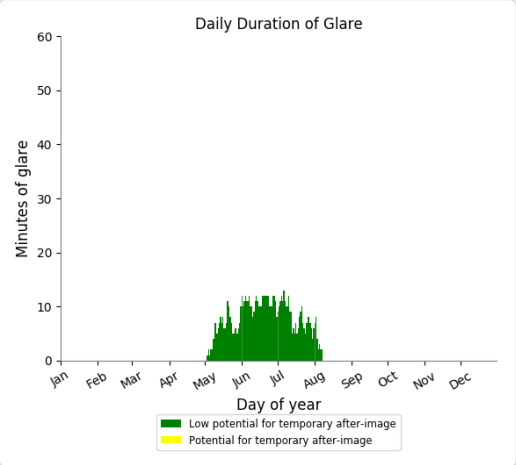


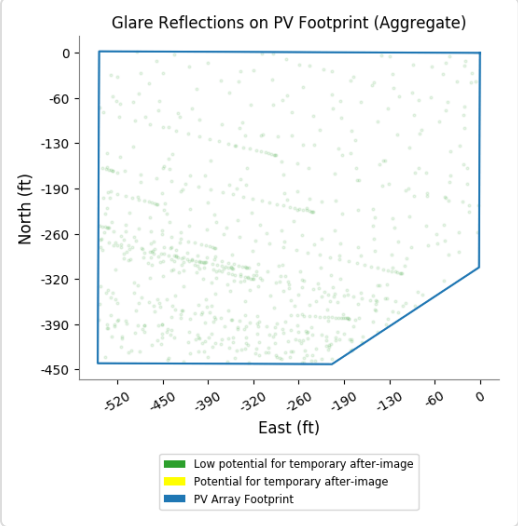
A1 4 - OP Receptor (OP 11)

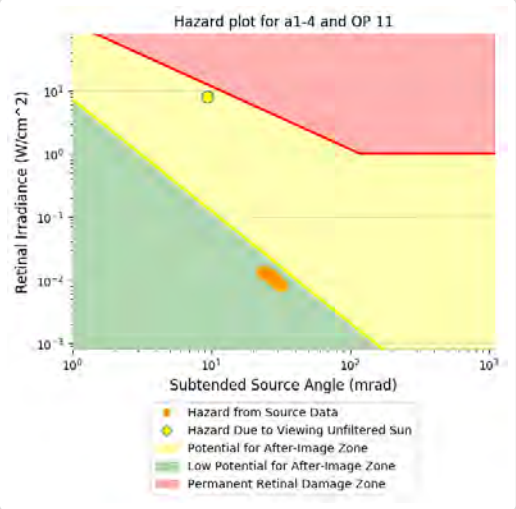
PV array is expected to produce the following glare for receptors at this location:

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









A1 4 - OP Receptor (OP 21)

No glare found

A1 4 - OP Receptor (OP 24)

No glare found

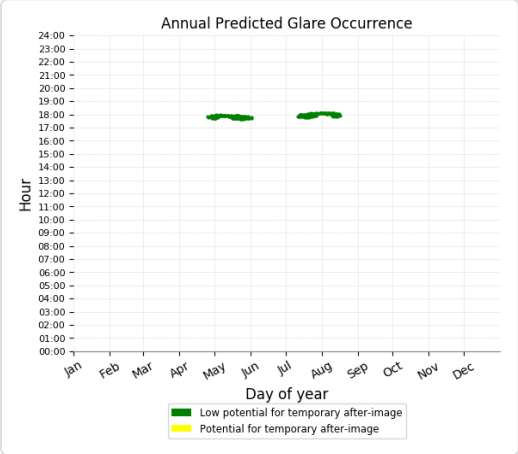
A1 4 - OP Receptor (OP 28)

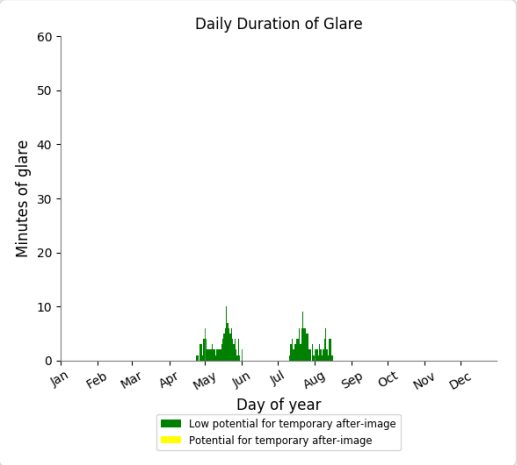
No glare found

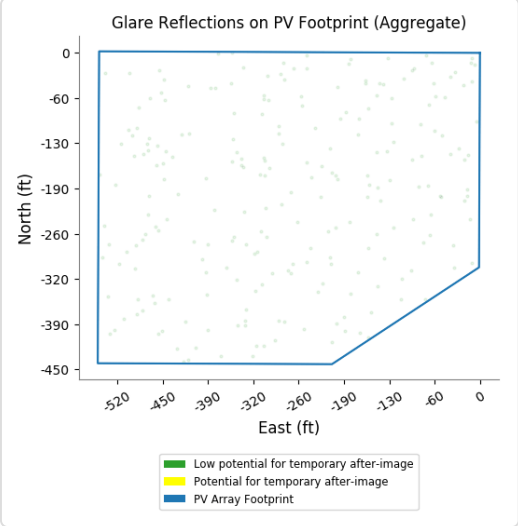
A1 4 - OP Receptor (OP 40)

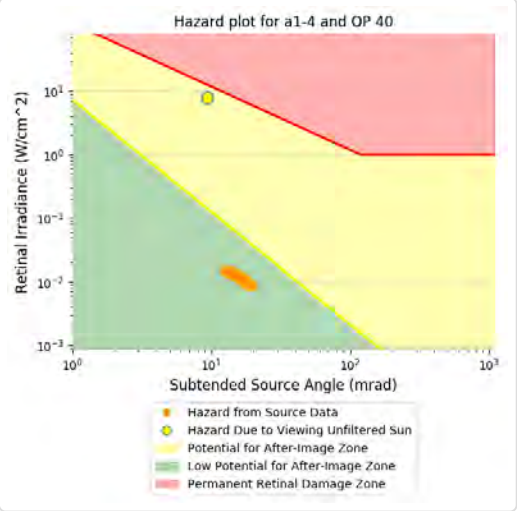
PV array is expected to produce the following glare for receptors at this location:

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





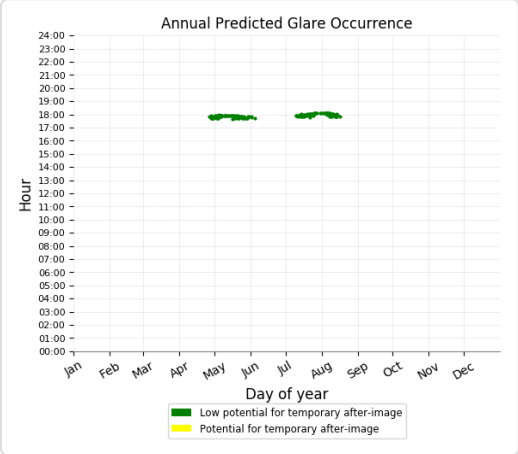


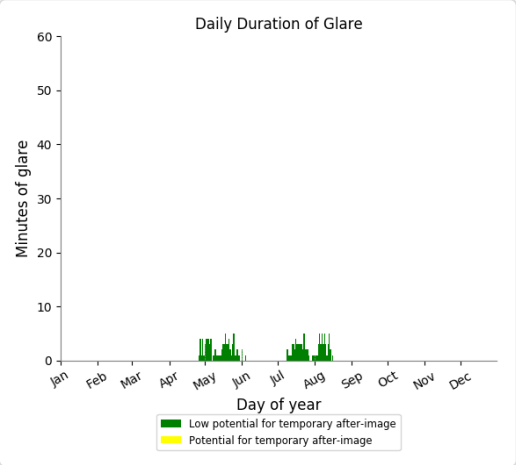


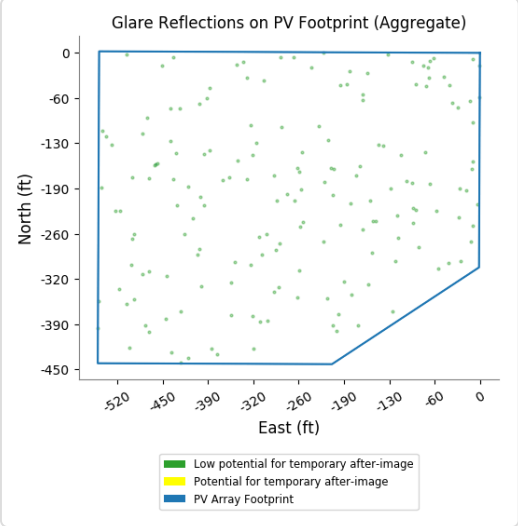
A1 4 - OP Receptor (OP 43)

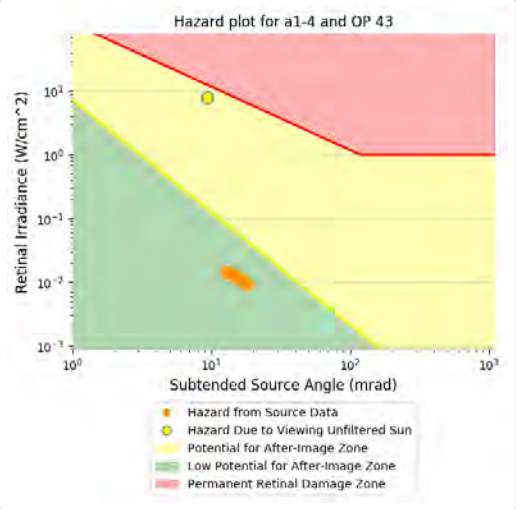
PV array is expected to produce the following glare for receptors at this location:

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





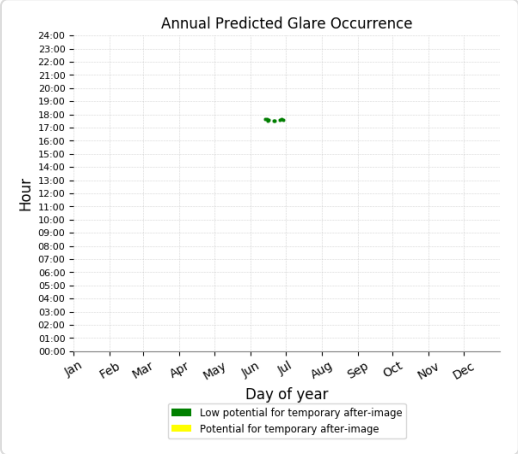


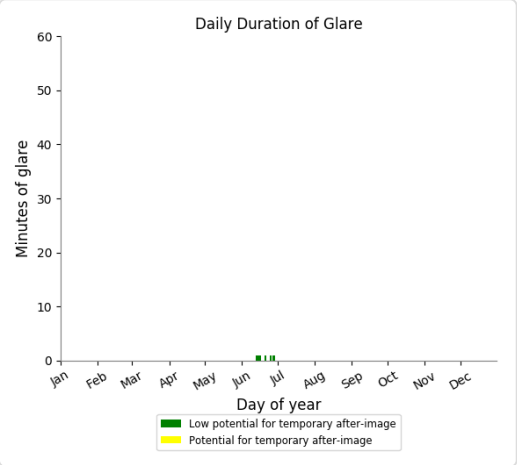


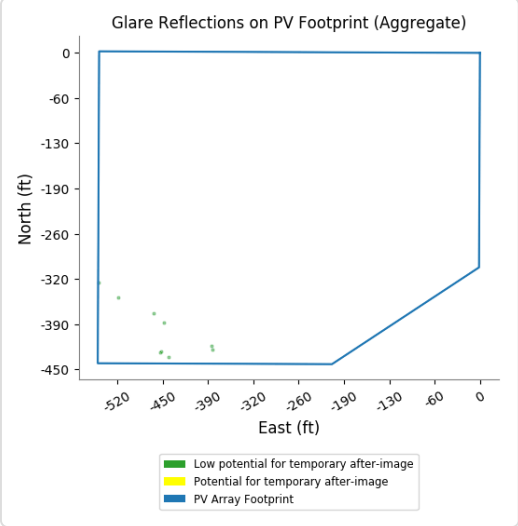
A1 4 - OP Receptor (OP 44)

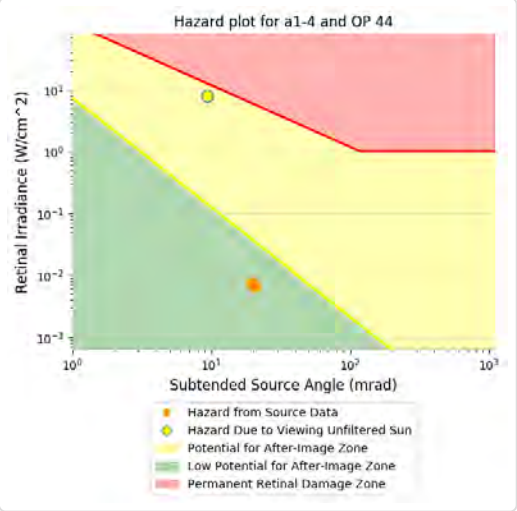
PV array is expected to produce the following glare for receptors at this location:

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









A1 4 - OP Receptor (OP 47)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

GlareGauge Glare Analysis Results

Site Configuration: Array 1-5 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:25 a.m.**
Updated **May 13, 2020 2:01 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39214.5043

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

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 5	25.0	180.0	854	0	-

Component Data

PV Array(s)

Name: A1 5
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.903586	-74.150799	595.27	10.00	605.27
2	42.902111	-74.150807	604.68	10.00	614.68
3	42.902113	-74.151441	603.85	10.00	613.85
4	42.902389	-74.151915	601.79	10.00	611.80
5	42.903589	-74.151908	585.00	10.00	595.00

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 2	42.907694	-74.149199	572.18	16.00	588.18
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 21	42.893908	-74.163184	668.51	16.00	684.51
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 54	42.894331	-74.163900	658.48	16.00	674.49
OP 73	42.892947	-74.141994	719.25	8.00	727.25
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 5	25.0	180.0	854	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 5 low potential for temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 2	0	0
OP: OP 10	177	0
OP: OP 11	486	0
OP: OP 21	0	0
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 43	191	0
OP: OP 44	0	0
OP: OP 47	0	0
OP: OP 54	0	0
OP: OP 73	0	0
OP: OP 76	0	0

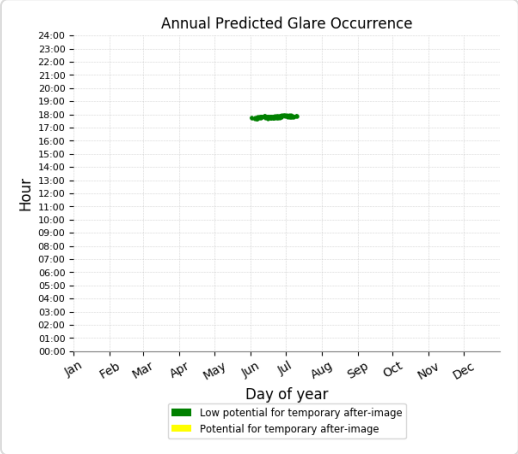
A1 5 - OP Receptor (OP 2)

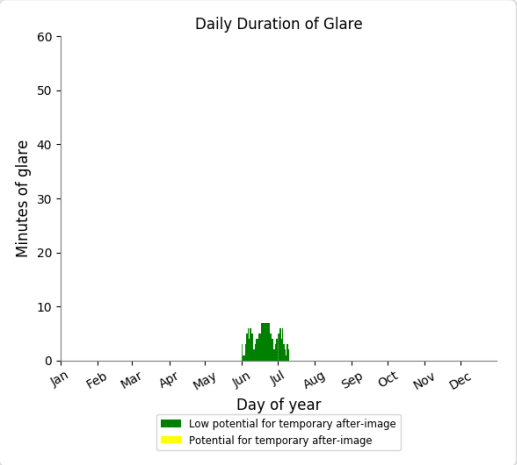
No glare found

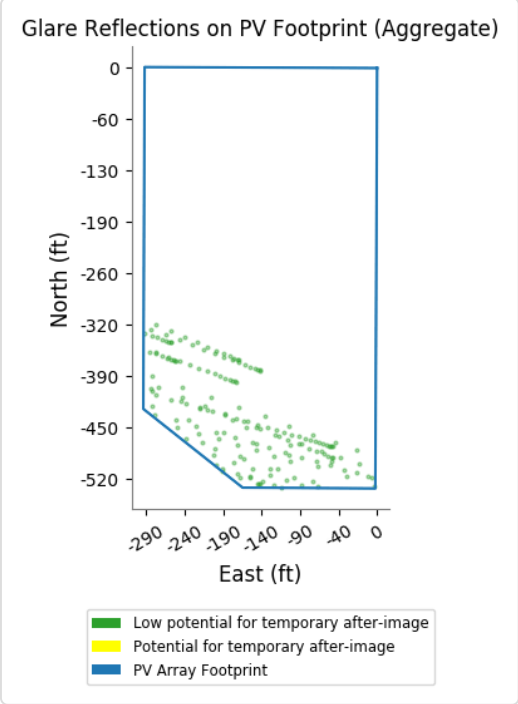
A1 5 - OP Receptor (OP 10)

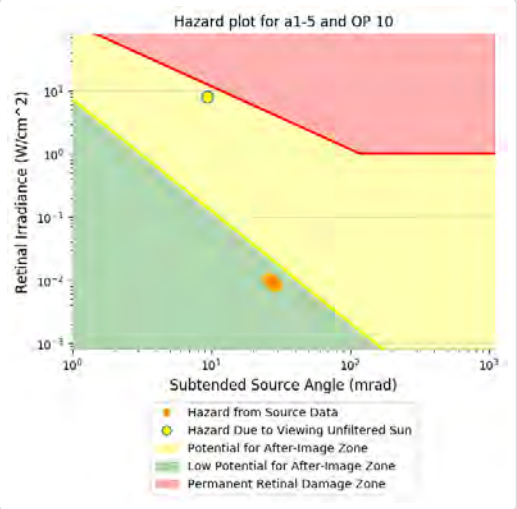
PV array is expected to produce the following glare for receptors at this location:

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





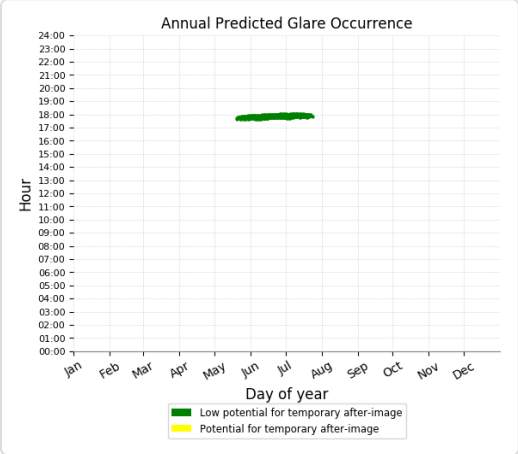


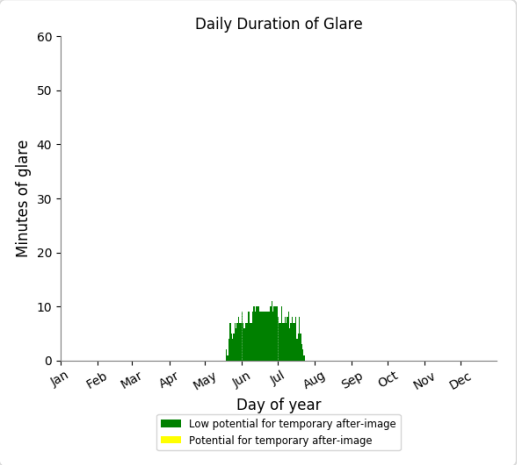


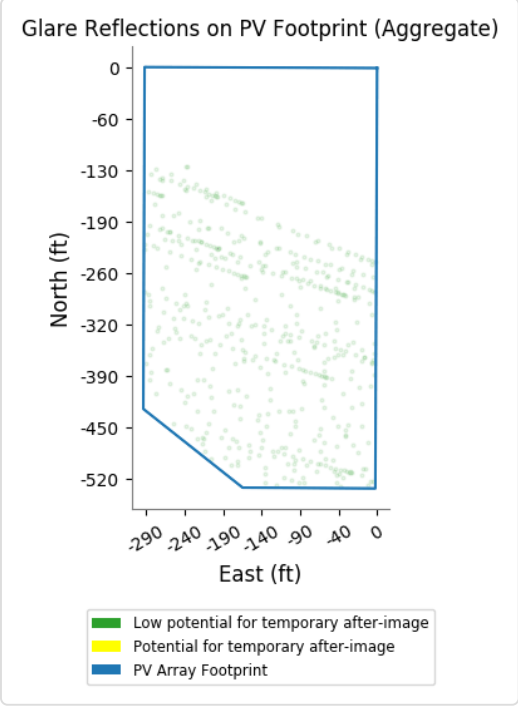
A1 5 - OP Receptor (OP 11)

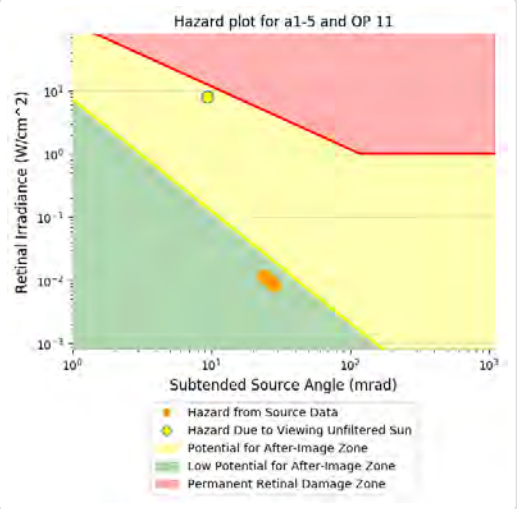
PV array is expected to produce the following glare for receptors at this location:

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









A1 5 - OP Receptor (OP 21)

No glare found

A1 5 - OP Receptor (OP 24)

No glare found

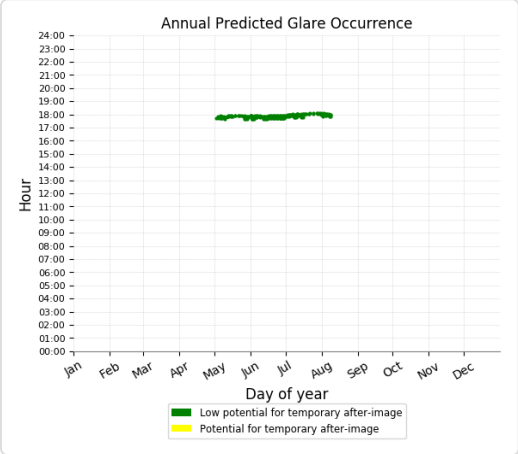
A1 5 - OP Receptor (OP 28)

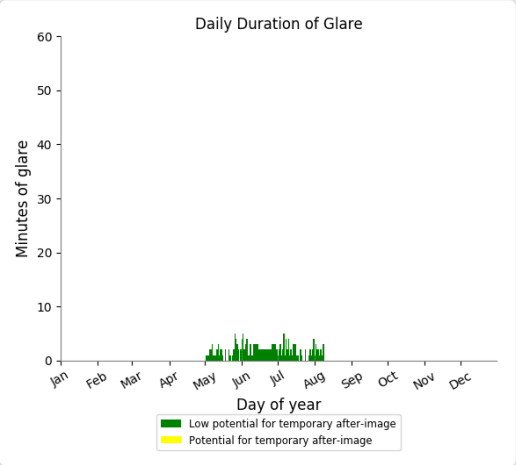
No glare found

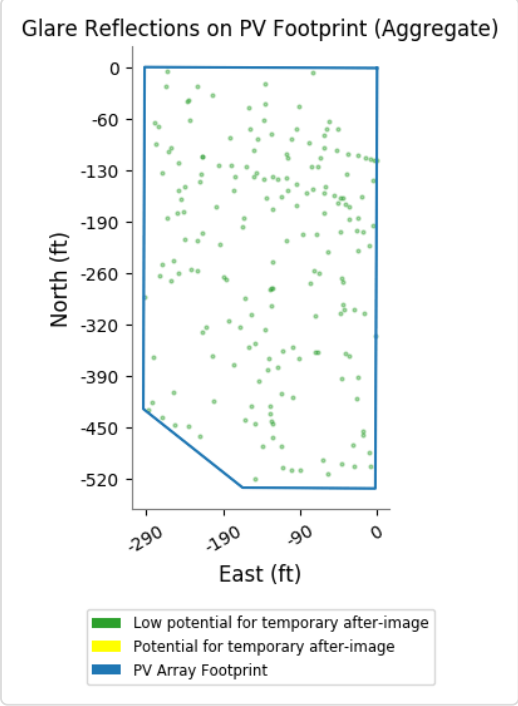
A1 5 - OP Receptor (OP 43)

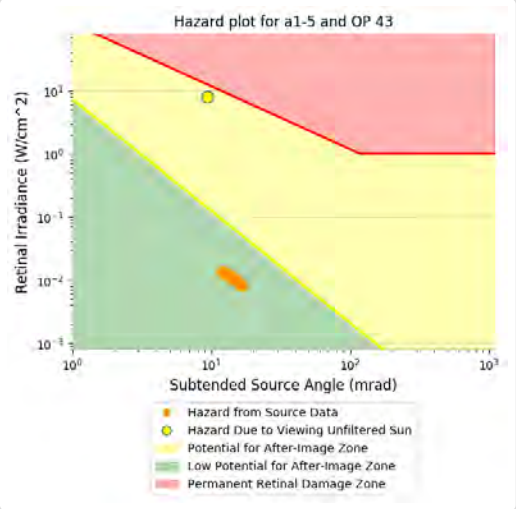
PV array is expected to produce the following glare for receptors at this location:

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









A1 5 - OP Receptor (OP 44)

No glare found

A1 5 - OP Receptor (OP 47)

No glare found

A1 5 - OP Receptor (OP 54)

No glare found

A1 5 - OP Receptor (OP 73)

No glare found

A1 5 - OP Receptor (OP 76)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-6 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:25 a.m.**
Updated **May 13, 2020 2:23 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39215.5043

Summary of Results

Glare with low potential for temporary after-image predicted

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 6	25.0	180.0	2,747	0	-

Component Data

PV Array(s)

Name: A1 6
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.902106	-74.149383	601.08	10.00	611.08
2	42.901450	-74.149387	591.38	10.00	601.38
3	42.900859	-74.150604	598.31	10.00	608.32
4	42.901534	-74.151445	603.19	10.00	613.19
5	42.902113	-74.151441	603.85	10.00	613.85

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 2	42.907694	-74.149199	572.18	16.00	588.18
OP 7	42.895080	-74.138024	656.83	16.00	672.83
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 73	42.892947	-74.141994	719.25	8.00	727.25
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 6	25.0	180.0	2,747	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 6 low potential for temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 2	0	0
OP: OP 7	0	0
OP: OP 10	990	0
OP: OP 11	1016	0
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 40	340	0
OP: OP 43	401	0
OP: OP 44	0	0
OP: OP 47	0	0
OP: OP 73	0	0
OP: OP 76	0	0

A1 6 - OP Receptor (OP 2)

No glare found

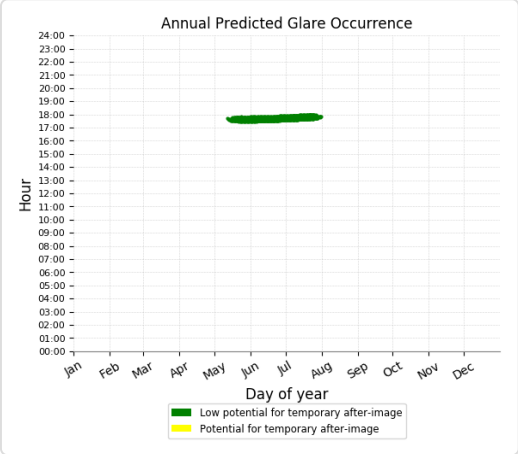
A1 6 - OP Receptor (OP 7)

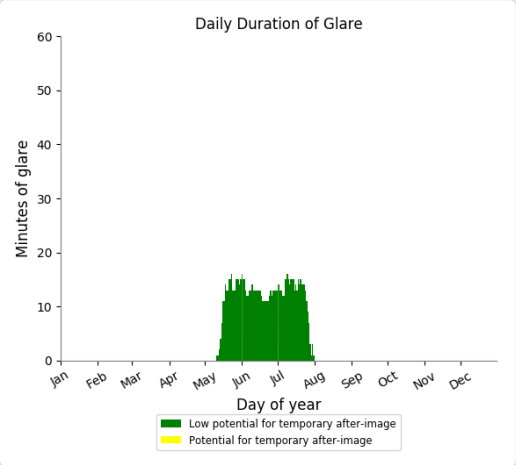
No glare found

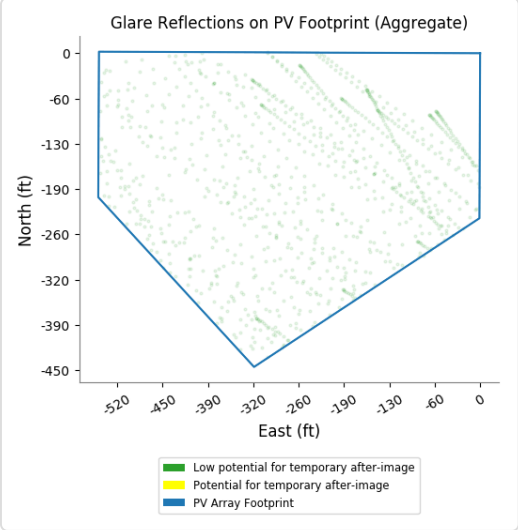
A1 6 - OP Receptor (OP 10)

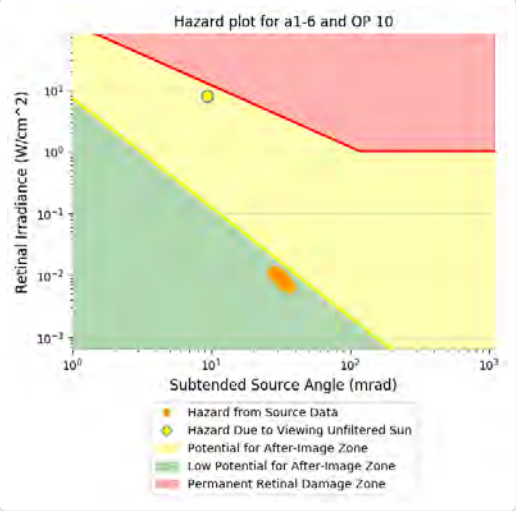
PV array is expected to produce the following glare for receptors at this location:

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





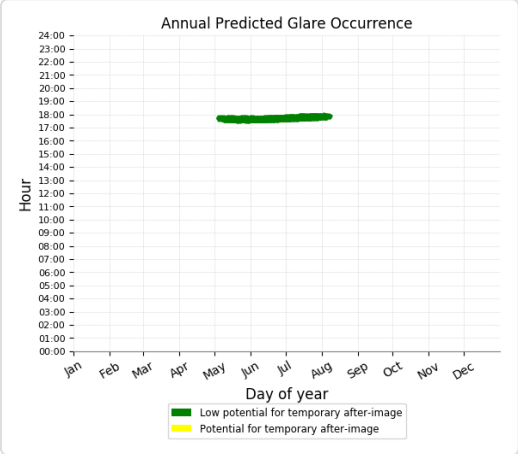


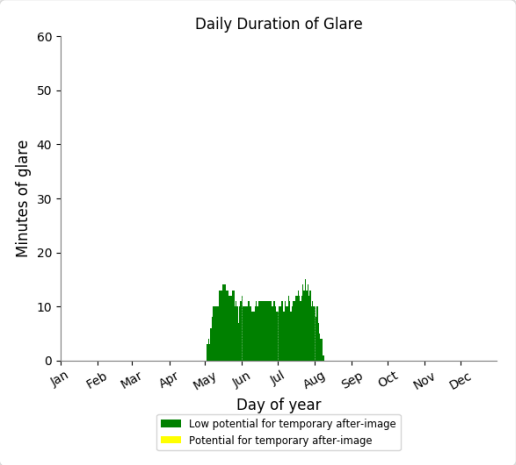


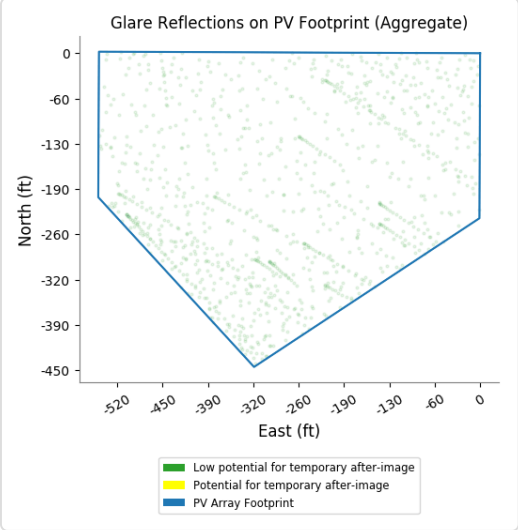
A1 6 - OP Receptor (OP 11)

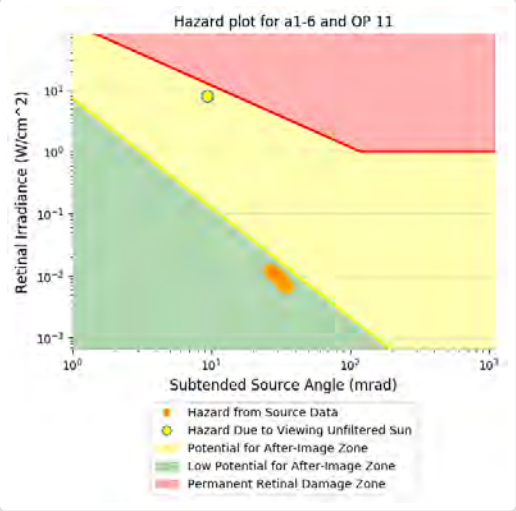
PV array is expected to produce the following glare for receptors at this location:

- 1,016 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.









A1 6 - OP Receptor (OP 24)

No glare found

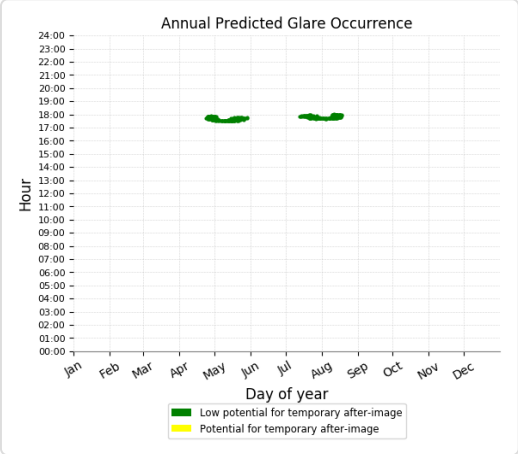
A1 6 - OP Receptor (OP 28)

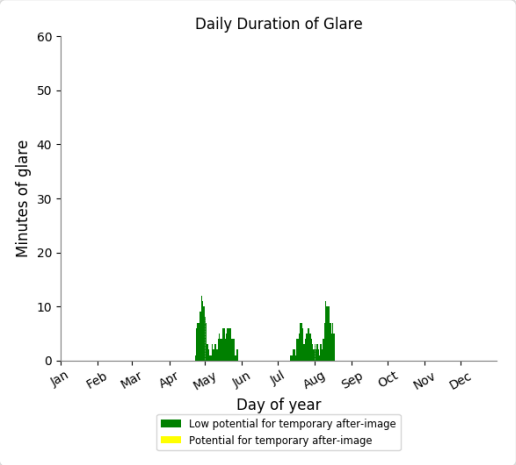
No glare found

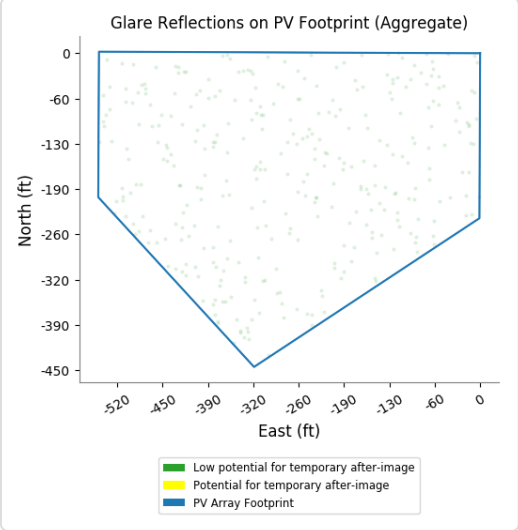
A1 6 - OP Receptor (OP 40)

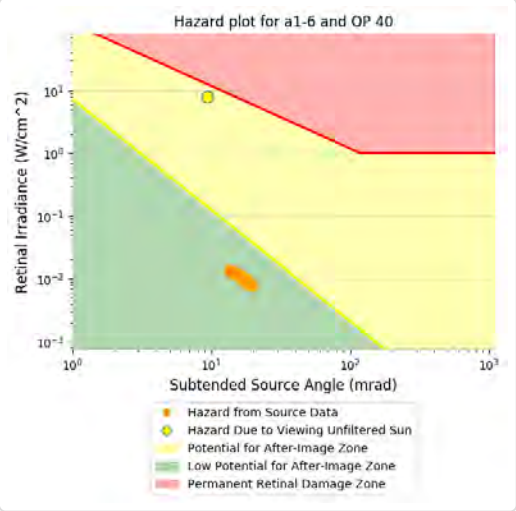
PV array is expected to produce the following glare for receptors at this location:

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





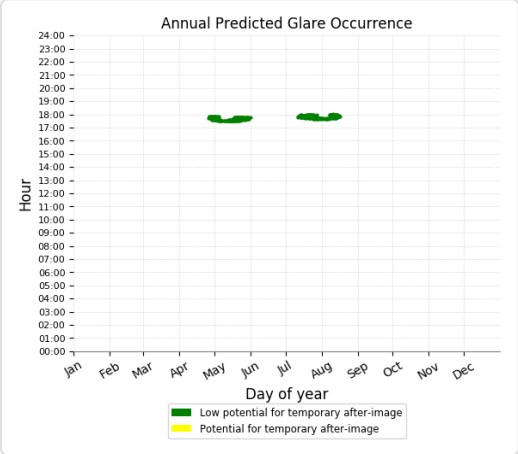


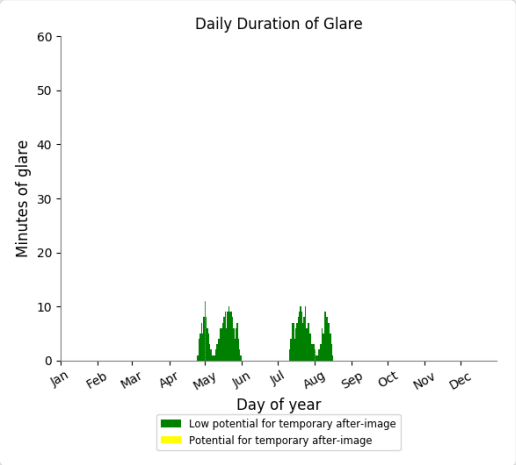


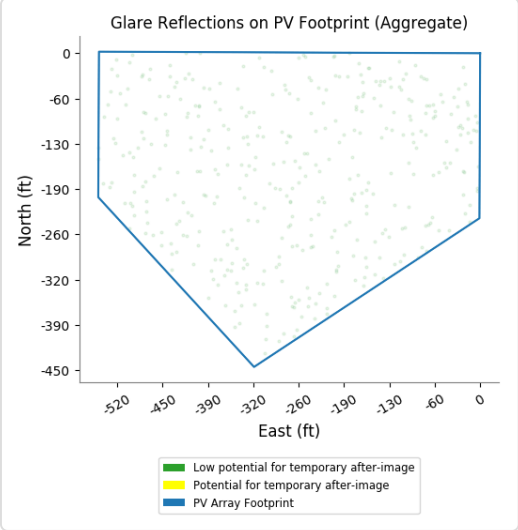
A1 6 - OP Receptor (OP 43)

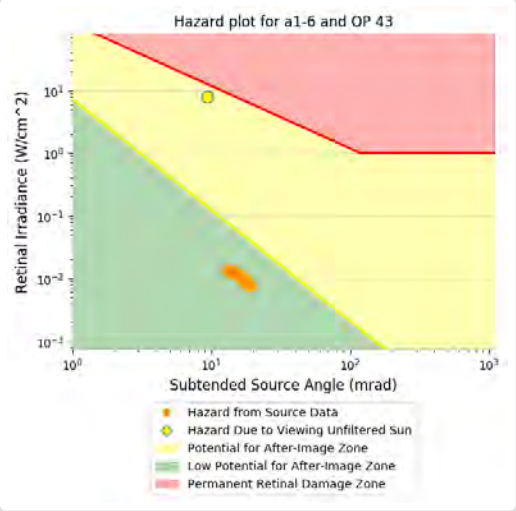
PV array is expected to produce the following glare for receptors at this location:

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









A1 6 - OP Receptor (OP 44)

No glare found

A1 6 - OP Receptor (OP 47)

No glare found

A1 6 - OP Receptor (OP 73)

No glare found

A1 6 - OP Receptor (OP 76)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-7 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:26 a.m.**
Updated **May 13, 2020 2:25 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39216.5043

Summary of Results

Glare with low potential for temporary after-image predicted

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 7	25.0	180.0	137	0	-

Component Data

PV Array(s)

Name: A1 7
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.903291	-74.155914	573.93	10.00	583.93
2	42.902267	-74.155086	587.93	10.00	597.93
3	42.901234	-74.155092	600.02	10.00	610.02
4	42.900823	-74.156069	603.89	10.00	613.89
5	42.900825	-74.156534	607.65	10.00	617.65
6	42.901784	-74.157062	600.99	10.00	610.99
7	42.903294	-74.157053	553.46	10.00	563.46

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 7	25.0	180.0	137	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 7 low potential for temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 44	137	0
OP: OP 47	0	0
OP: OP 76	0	0

A1 7 - OP Receptor (OP 24)

No glare found

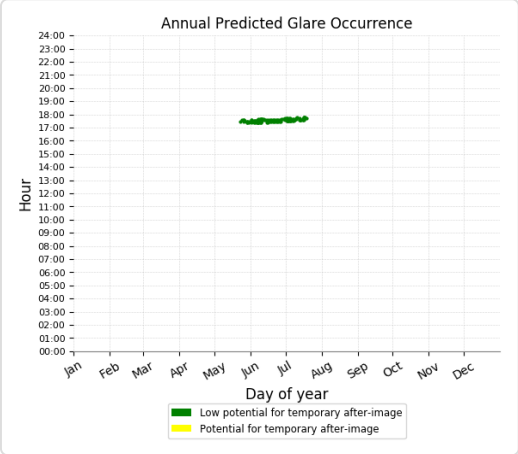
A1 7 - OP Receptor (OP 28)

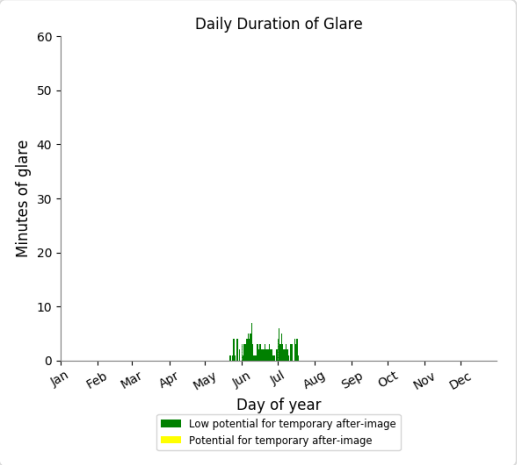
No glare found

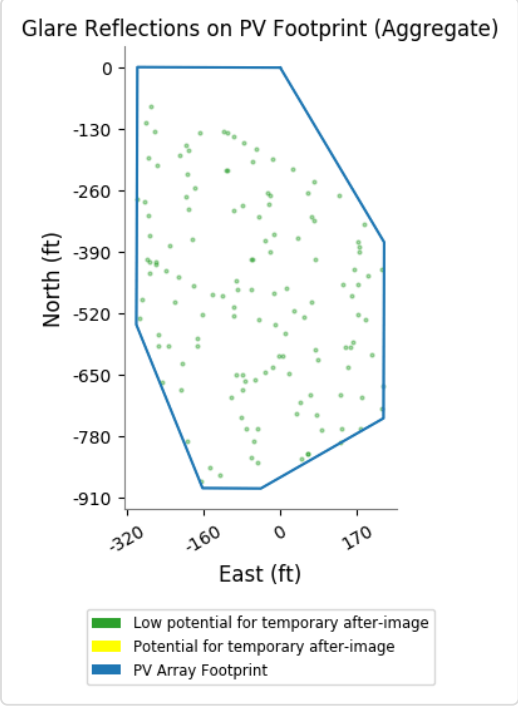
A1 7 - OP Receptor (OP 44)

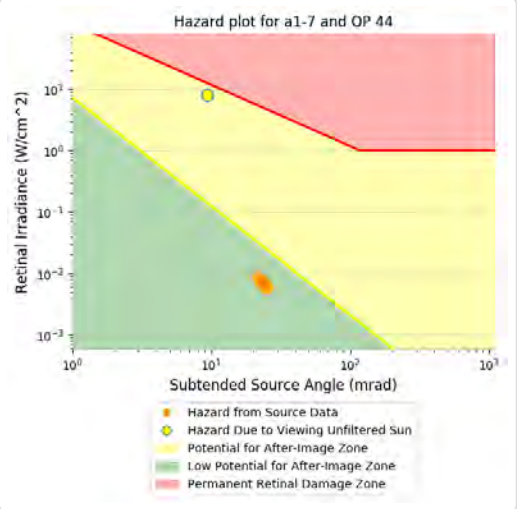
PV array is expected to produce the following glare for receptors at this location:

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









A1 7 - OP Receptor (OP 47)

No glare found

A1 7 - OP Receptor (OP 76)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-8 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:34 a.m.**
Updated **May 13, 2020 3:25 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39217.5043

Summary of Results

Glare with low potential for temporary after-image predicted

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 8	25.0	180.0	341	0	-

Component Data

PV Array(s)

Name: A1 8
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.901575	-74.153190	600.68	10.00	610.68
2	42.899925	-74.152210	599.46	10.00	609.46
3	42.899520	-74.153042	599.58	10.00	609.58
4	42.899525	-74.154702	603.30	10.00	613.30
5	42.901006	-74.154694	599.36	10.00	609.36
6	42.901577	-74.153901	594.27	10.00	604.27

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 21	42.893908	-74.163184	668.51	16.00	684.51
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 8	25.0	180.0	341	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 8 low potential for temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 21	0	0
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 40	14	0
OP: OP 44	327	0
OP: OP 47	0	0
OP: OP 76	0	0

A1 8 - OP Receptor (OP 21)

No glare found

A1 8 - OP Receptor (OP 24)

No glare found

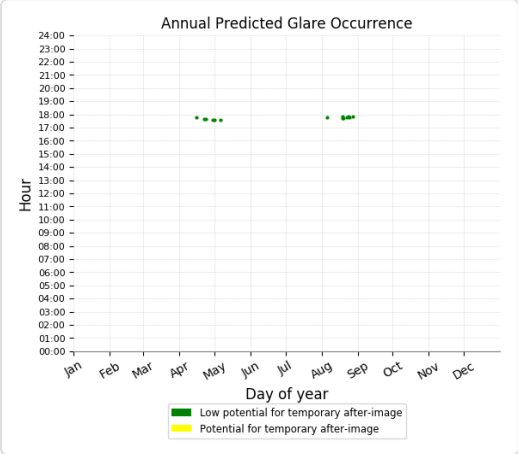
A1 8 - OP Receptor (OP 28)

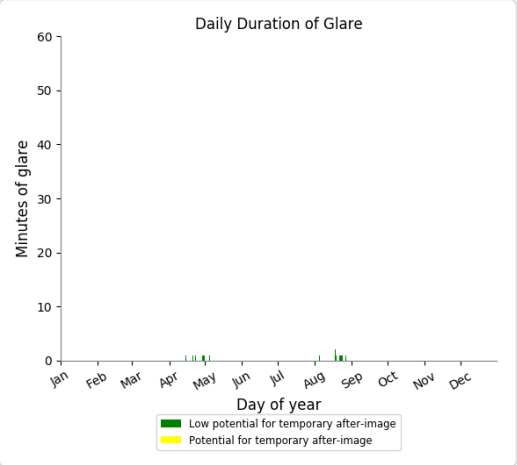
No glare found

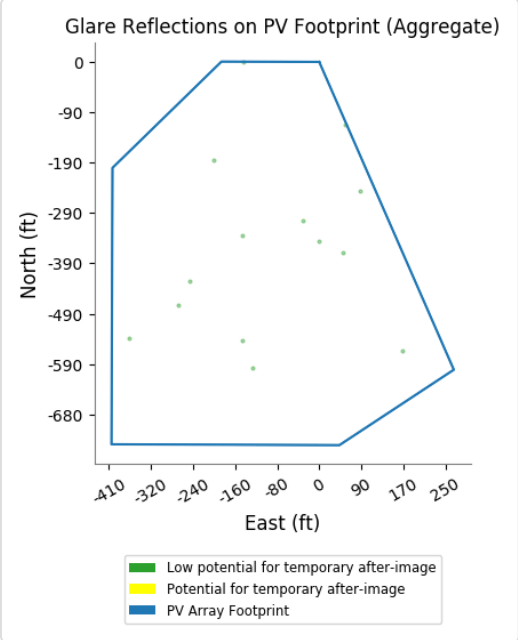
A1 8 - OP Receptor (OP 40)

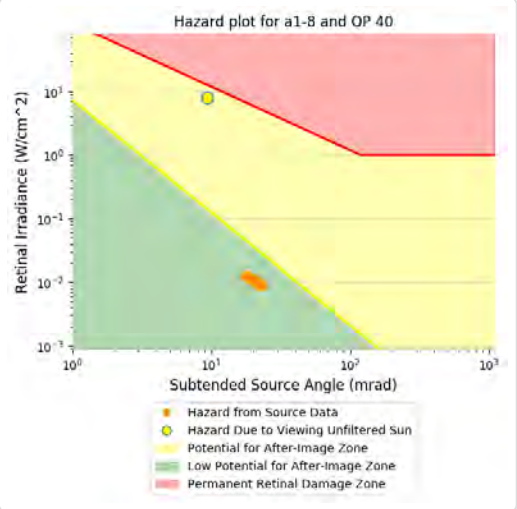
PV array is expected to produce the following glare for receptors at this location:

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





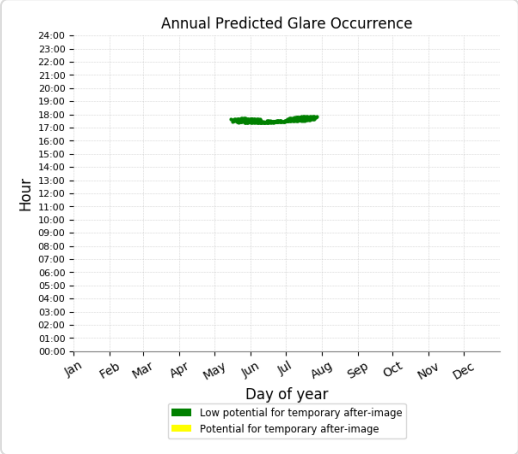


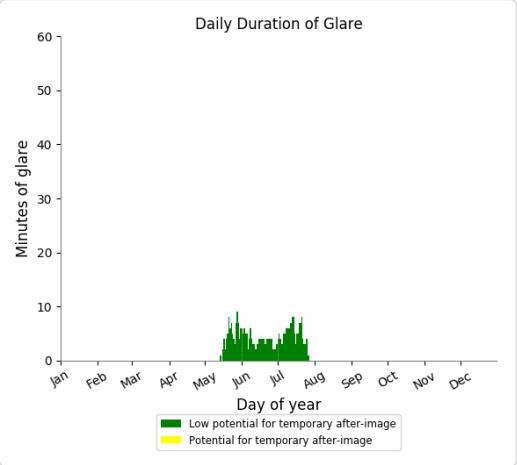


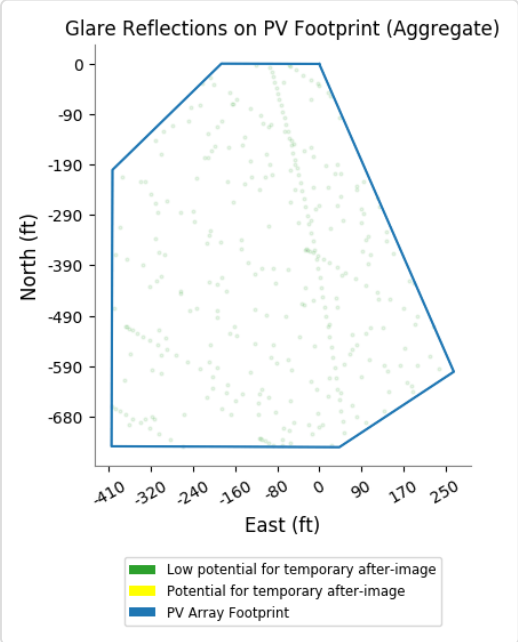
A1 8 - OP Receptor (OP 44)

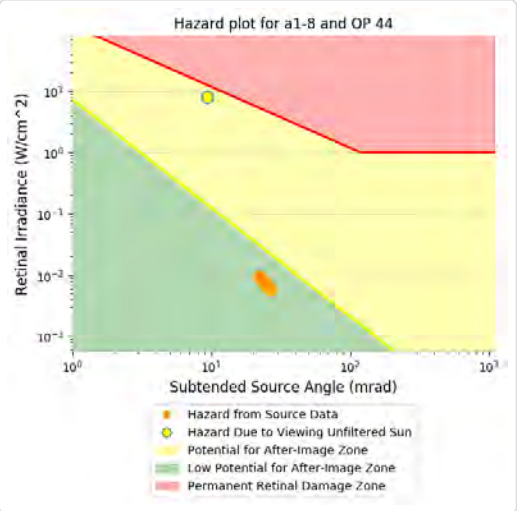
PV array is expected to produce the following glare for receptors at this location:

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









A1 8 - OP Receptor (OP 47)

No glare found

A1 8 - OP Receptor (OP 76)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

GlareGauge Glare Analysis Results

Site Configuration: Array 1-9 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:34 a.m.**
Updated **May 13, 2020 3:27 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39218.5043

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

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 9	25.0	180.0	932	0	-

Component Data

PV Array(s)

Name: A1 9
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.899619	-74.154702	602.97	10.00	612.97
2	42.898057	-74.157537	612.76	10.00	622.76
3	42.899880	-74.157527	606.65	10.00	616.65
4	42.901006	-74.154694	599.36	10.00	609.36

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 9	25.0	180.0	932	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 9 low potential for temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 40	137	0
OP: OP 44	795	0
OP: OP 47	0	0
OP: OP 76	0	0

A1 9 - OP Receptor (OP 24)

No glare found

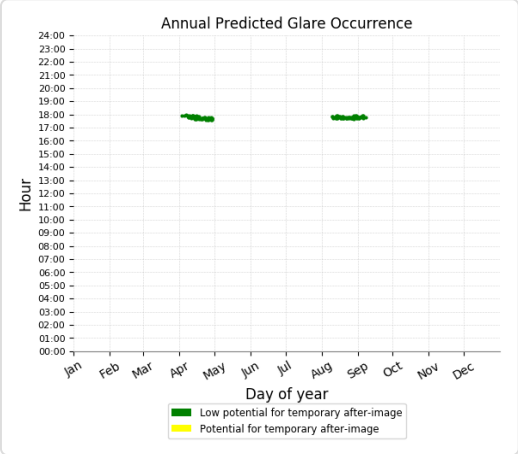
A1 9 - OP Receptor (OP 28)

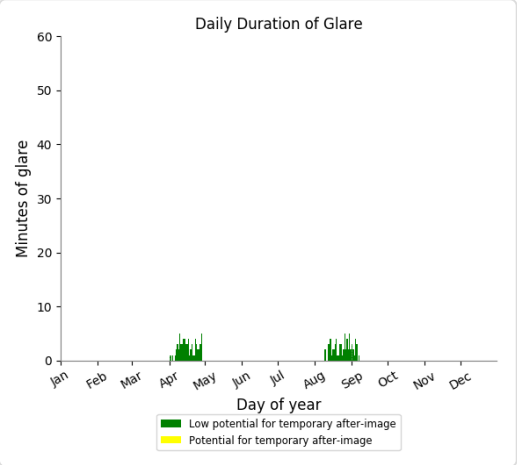
No glare found

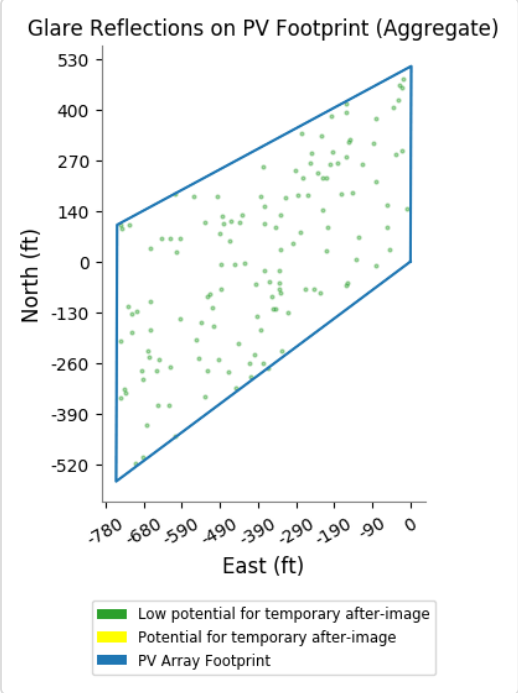
A1 9 - OP Receptor (OP 40)

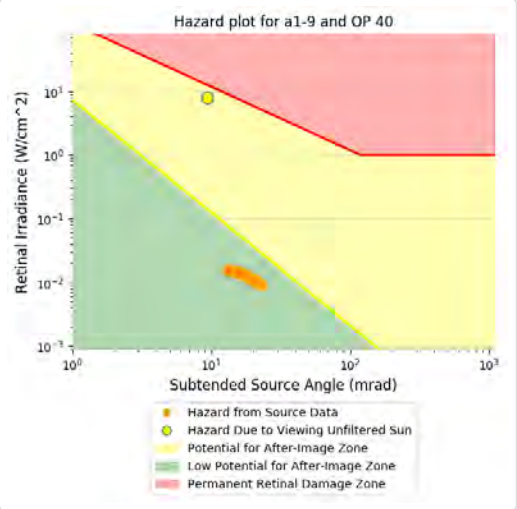
PV array is expected to produce the following glare for receptors at this location:

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





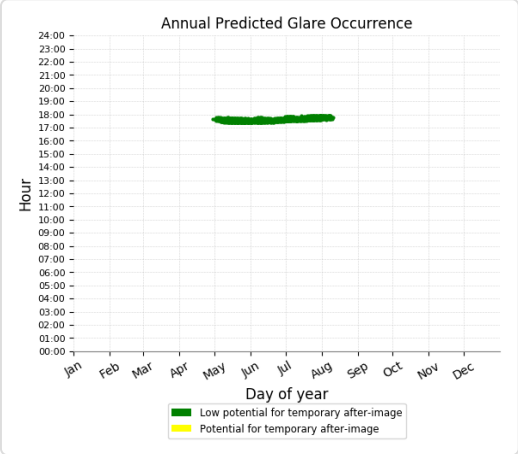


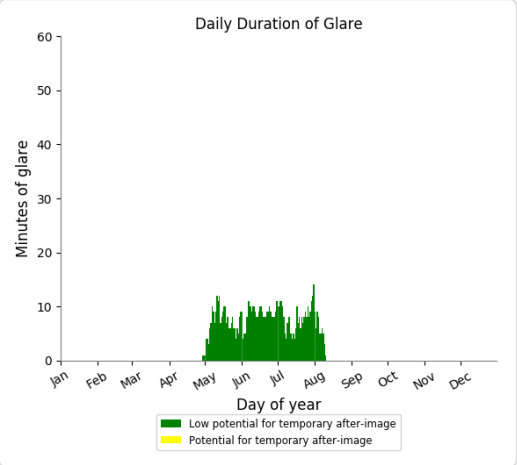


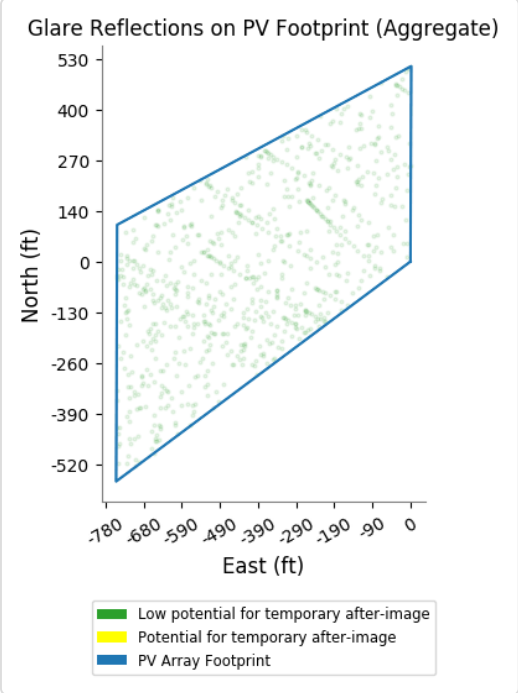
A1 9 - OP Receptor (OP 44)

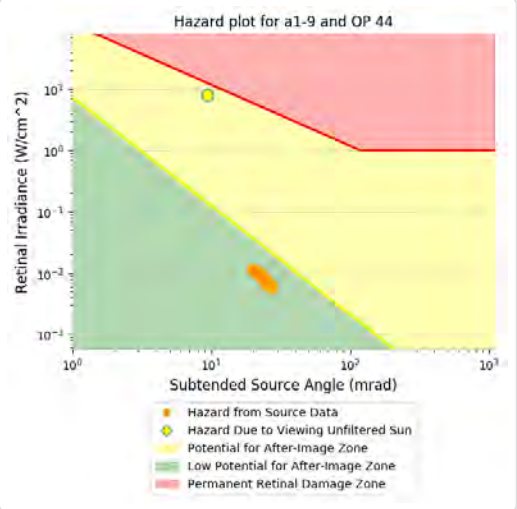
PV array is expected to produce the following glare for receptors at this location:

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









A1 9 - OP Receptor (OP 47)

No glare found

A1 9 - OP Receptor (OP 76)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-10 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:35 a.m.**
Updated **May 13, 2020 3:31 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39219.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 10	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A1 10
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.899880	-74.157527	606.65	10.00	616.65
2	42.898057	-74.157537	612.76	10.00	622.76
3	42.897509	-74.158533	619.48	10.00	629.48
4	42.897511	-74.159393	622.15	10.00	632.15
5	42.899885	-74.159380	609.44	10.00	619.44

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 21	42.893908	-74.163184	668.51	16.00	684.51
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 54	42.894331	-74.163900	658.48	16.00	674.49
OP 66	42.894854	-74.164041	650.56	8.00	658.56

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 10	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 10 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 21	0	0
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 54	0	0
OP: OP 66	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-11 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:35 a.m.**
Updated **May 13, 2020 3:41 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39220.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 11	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A1 11
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.901709	-74.158463	590.77	10.00	600.77
2	42.901118	-74.157864	606.92	10.00	616.92
3	42.899657	-74.160964	607.39	10.00	617.39
4	42.901006	-74.160397	594.69	10.00	604.69

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 54	42.894331	-74.163900	658.48	16.00	674.49
OP 55	42.894267	-74.160897	654.61	16.00	670.61
OP 66	42.894854	-74.164041	650.56	8.00	658.56

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 11	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 11 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 54	0	0
OP: OP 55	0	0
OP: OP 66	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 1-12 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:35 a.m.**
Updated **May 13, 2020 3:42 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39221.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A1 12	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A1 12
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.900405	-74.159377	609.42	10.00	619.42
2	42.897511	-74.159393	622.15	10.00	632.15
3	42.897516	-74.160976	619.02	10.00	629.02
4	42.899657	-74.160964	607.39	10.00	617.39

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 21	42.893908	-74.163184	668.51	16.00	684.51
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 54	42.894331	-74.163900	658.48	16.00	674.49
OP 55	42.894267	-74.160897	654.61	16.00	670.61
OP 66	42.894854	-74.164041	650.56	8.00	658.56

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A1 12	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A1 12 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 21	0	0
OP: OP 24	0	0
OP: OP 54	0	0
OP: OP 55	0	0
OP: OP 66	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 2-1 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:57 a.m.**
Updated **May 13, 2020 3:45 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39225.5043

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
A2 1	25.0	180.0	0	8,070	-

Component Data

PV Array(s)

Name: A2 1
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.897506	-74.157616	616.69	10.00	626.69
2	42.894126	-74.155439	668.52	10.00	678.52
3	42.893487	-74.156748	670.07	10.00	680.07
4	42.893203	-74.158590	675.95	10.00	685.95
5	42.896644	-74.160981	630.57	10.00	640.57
6	42.897516	-74.160976	619.02	10.00	629.02

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 21	42.893908	-74.163184	668.51	16.00	684.51
OP 54	42.894331	-74.163900	658.48	16.00	674.49
OP 66	42.894854	-74.164041	650.56	8.00	658.56

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A2 1	25.0	180.0	0	8,070	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

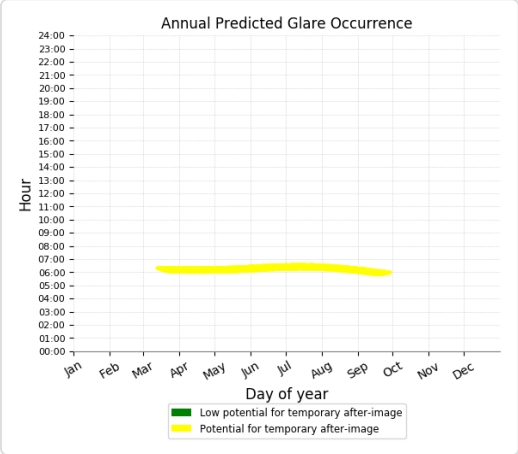
A2 1 potential temporary after-image

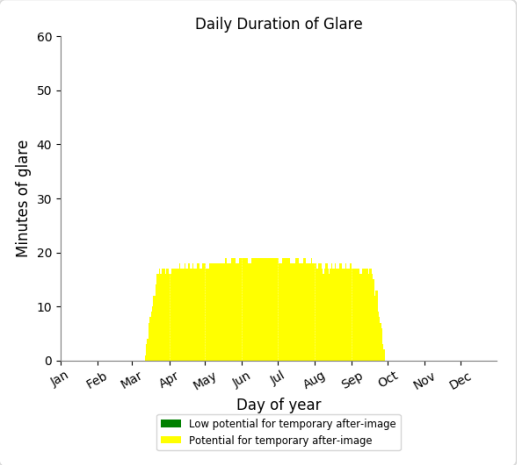
Component	Green glare (min)	Yellow glare (min)
OP: OP 21	0	3393
OP: OP 54	0	2986
OP: OP 66	0	1691

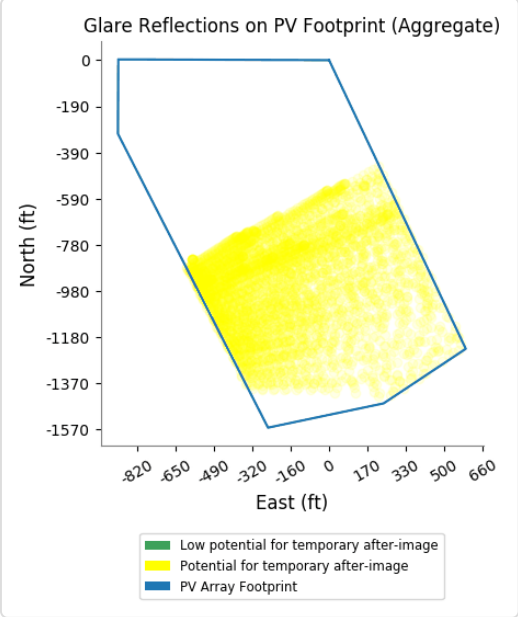
A2 1 - OP Receptor (OP 21)

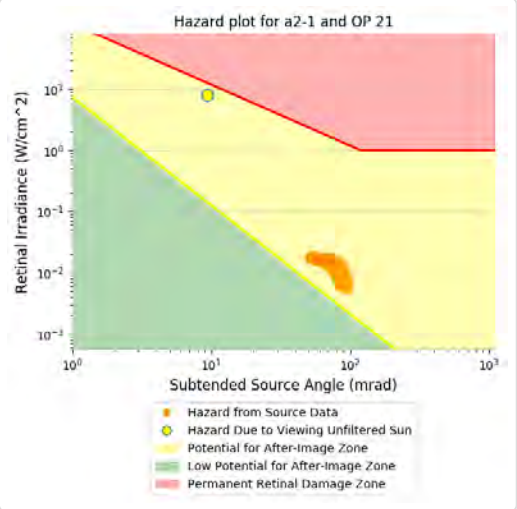
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 3,393 minutes of "yellow" glare with potential to cause temporary after-image.





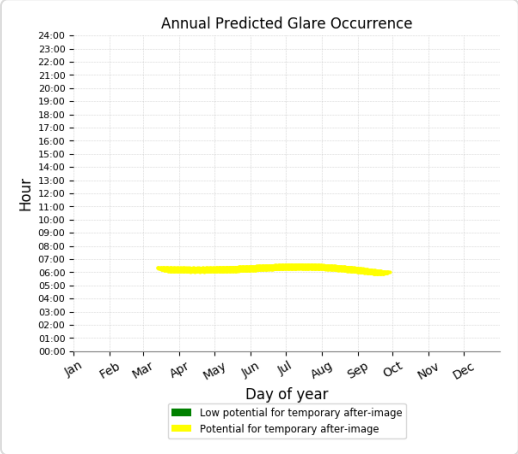


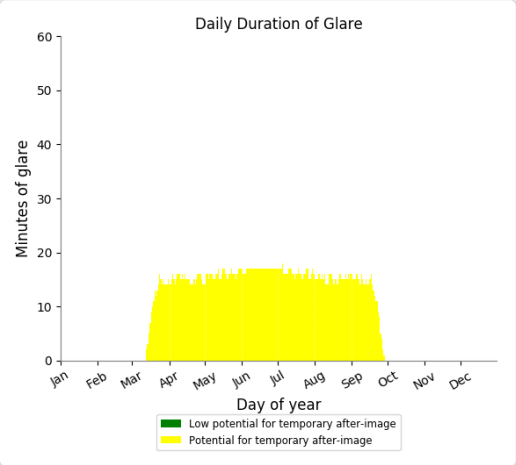


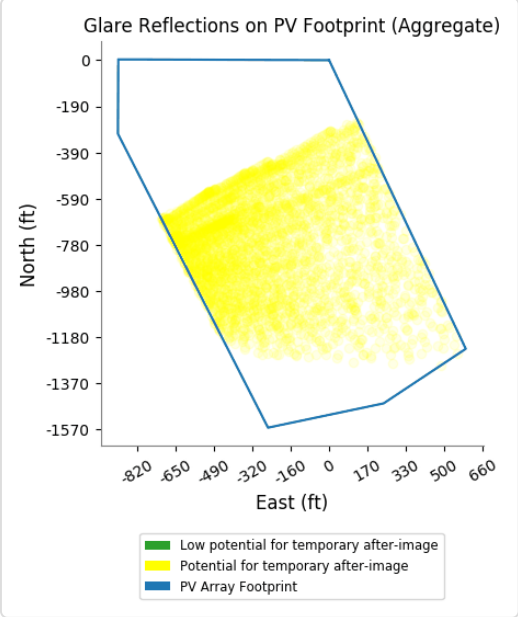
A2 1 - OP Receptor (OP 54)

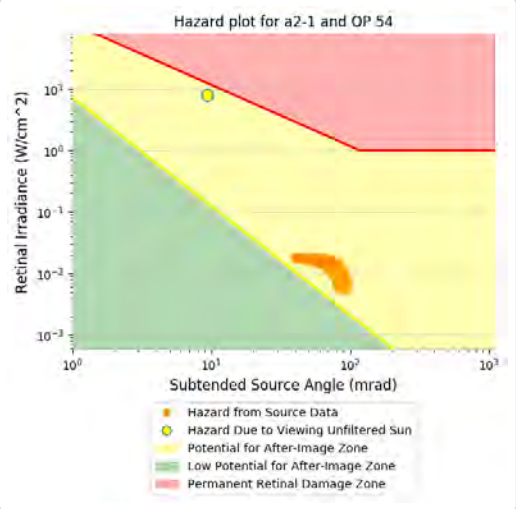
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,986 minutes of "yellow" glare with potential to cause temporary after-image.





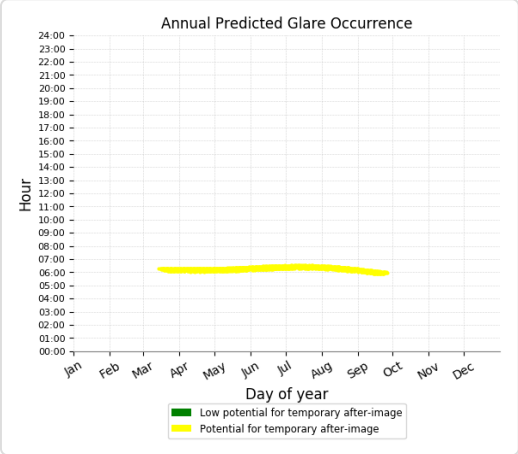


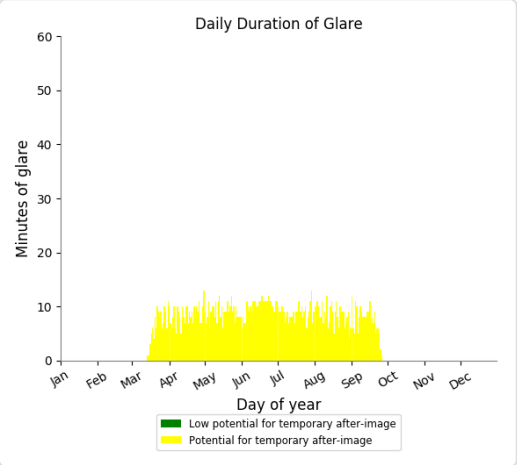


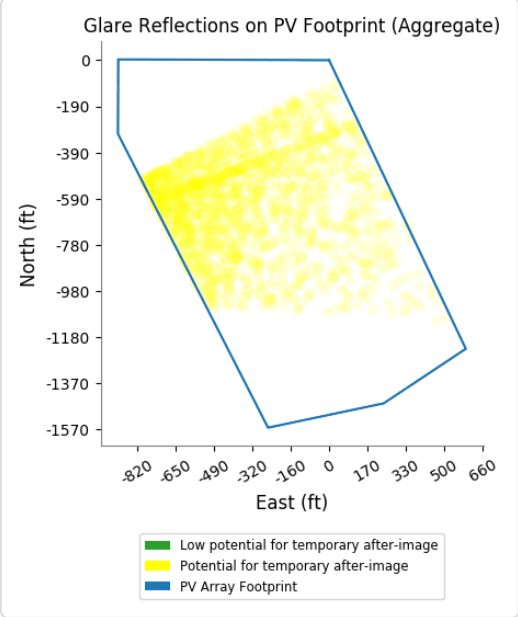
A2 1 - OP Receptor (OP 66)

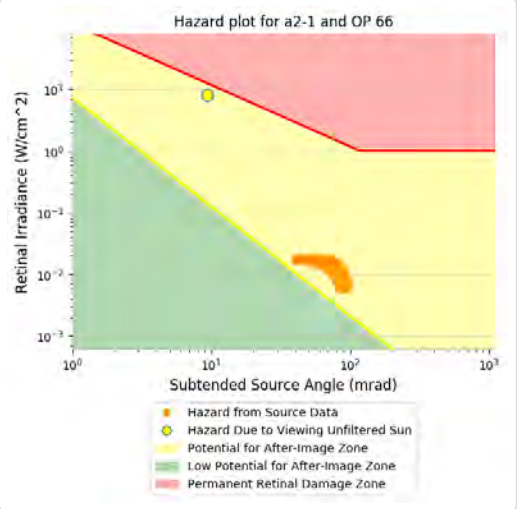
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,691 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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 2-2 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:59 a.m.**
Updated **May 13, 2020 10:59 a.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39226.5043

No results yet - submit a glare analysis using the editor to see glare results

Component Data

PV Array(s)

Name: A2 2
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.894468	-74.154740	662.19	10.00	672.19
2	42.893054	-74.153385	691.36	10.00	701.36
3	42.892427	-74.155979	692.18	10.00	702.18
4	42.893487	-74.156748	670.07	10.00	680.07

Summary of PV Glare Analysis PV configuration and predicted glare

PV & Receptor Analysis Results detailed results for each PV array and receptor

No PV Array Results

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 2-3 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 10:59 a.m.**
Updated **May 13, 2020 3:51 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39227.5043

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
A2 3	25.0	180.0	0	5,815	-

Component Data

PV Array(s)

Name: A2 3
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.898941	-74.155011	606.32	10.00	616.32
2	42.898935	-74.153214	599.13	10.00	609.13
3	42.895203	-74.153235	646.52	10.00	656.52
4	42.894126	-74.155439	668.52	10.00	678.52
5	42.897506	-74.157616	616.69	10.00	626.69

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 21	42.893908	-74.163184	668.51	16.00	684.51
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 54	42.894331	-74.163900	658.48	16.00	674.49
OP 66	42.894854	-74.164041	650.56	8.00	658.56

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A2 3	25.0	180.0	0	5,815	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

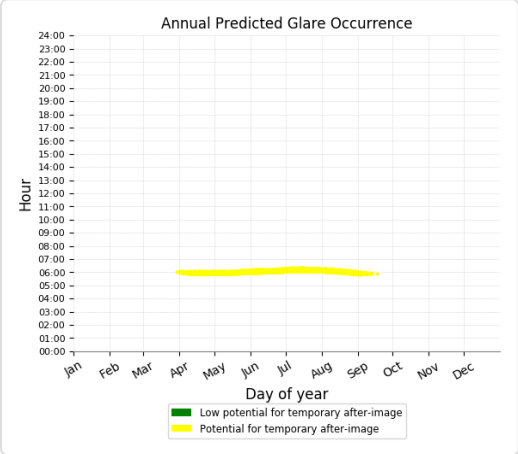
A2 3 potential temporary after-image

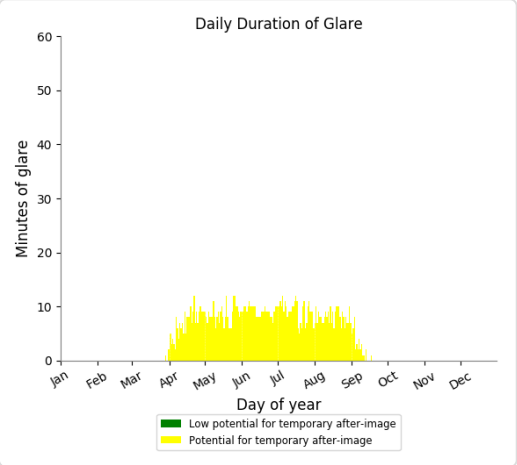
Component	Green glare (min)	Yellow glare (min)
OP: OP 21	0	1324
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 47	0	0
OP: OP 54	0	1966
OP: OP 66	0	2525

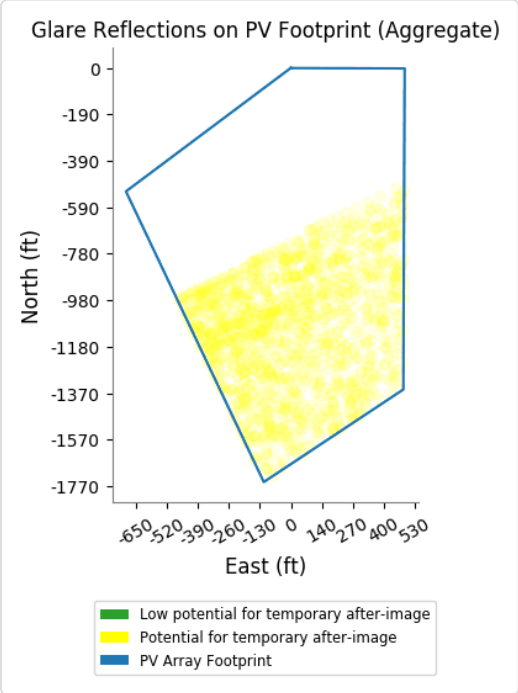
A2 3 - OP Receptor (OP 21)

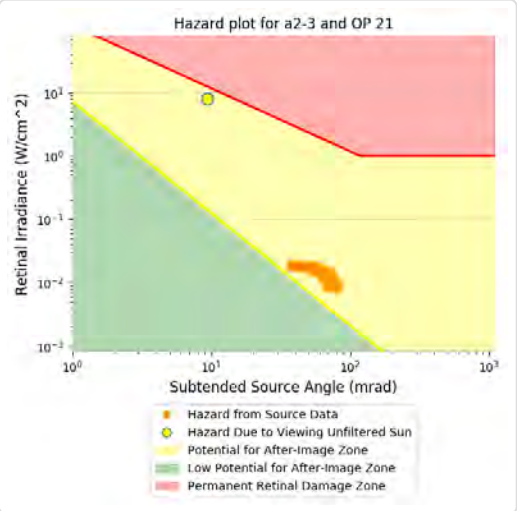
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,324 minutes of "yellow" glare with potential to cause temporary after-image.









A2 3 - OP Receptor (OP 24)

No glare found

A2 3 - OP Receptor (OP 28)

No glare found

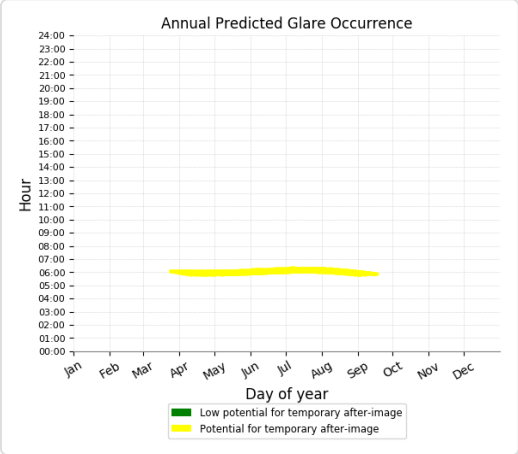
A2 3 - OP Receptor (OP 47)

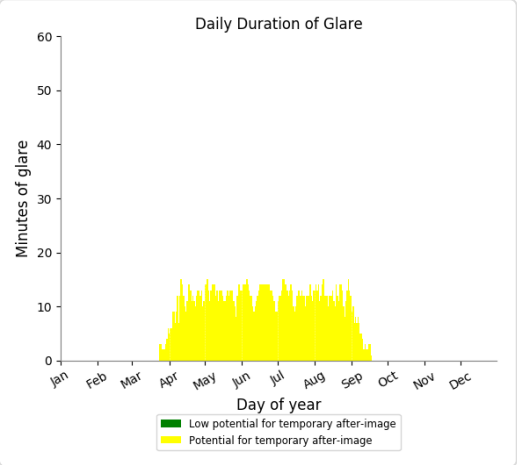
No glare found

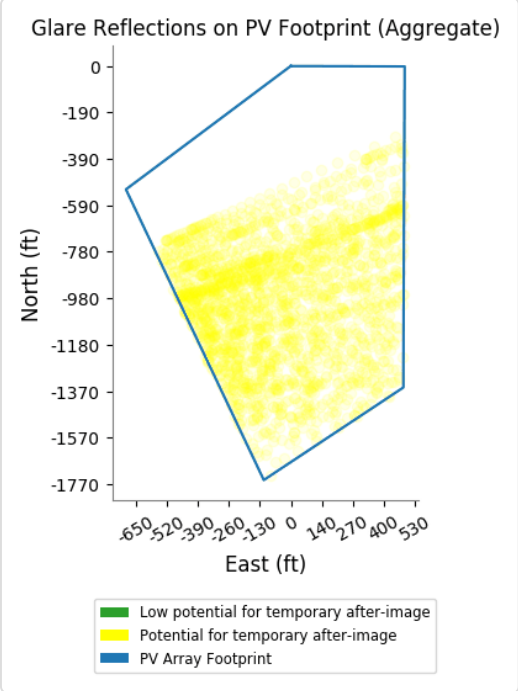
A2 3 - OP Receptor (OP 54)

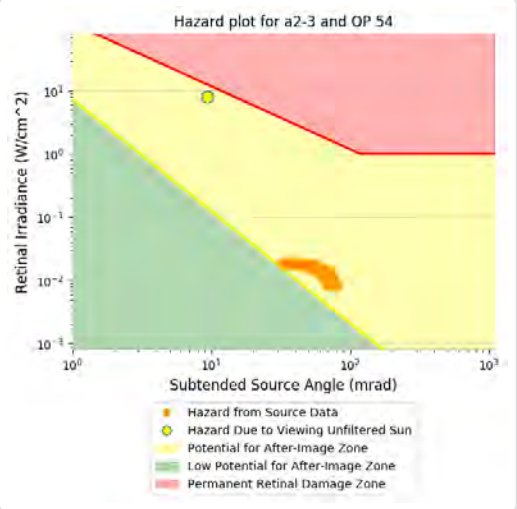
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,966 minutes of "yellow" glare with potential to cause temporary after-image.





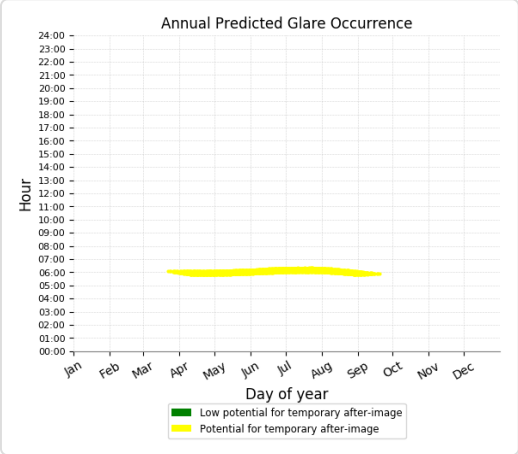


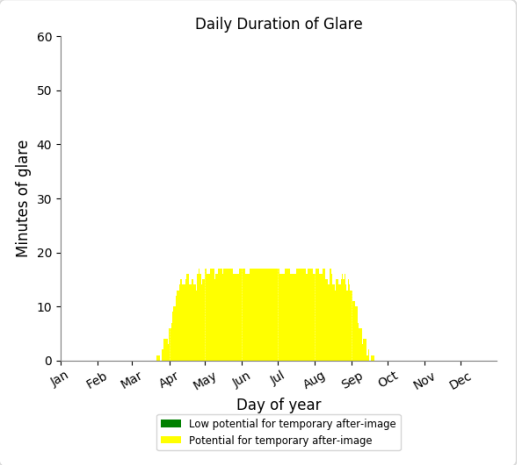


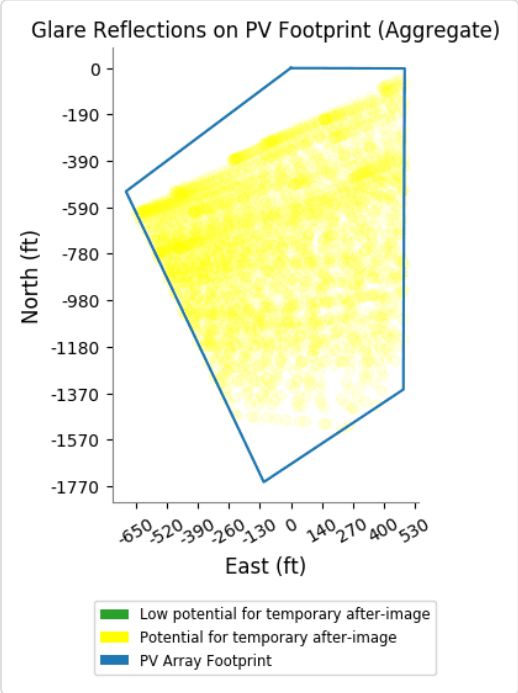
A2 3 - OP Receptor (OP 66)

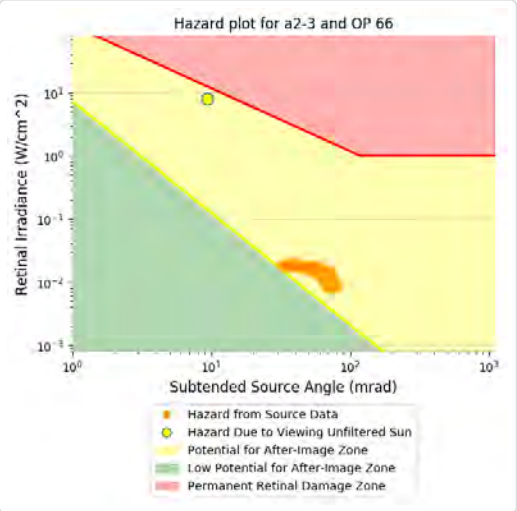
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,525 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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 2-4 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 11:02 a.m.**
Updated **May 13, 2020 4:30 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39229.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A2 4	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A2 4
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.899663	-74.151175	595.99	10.00	605.99
2	42.899002	-74.149502	597.63	10.00	607.63
3	42.897032	-74.149489	625.14	10.00	635.14
4	42.895203	-74.153235	646.52	10.00	656.52
5	42.898935	-74.153214	599.13	10.00	609.13

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A2 4	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A2 4 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 47	0	0
OP: OP 76	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

GlareGauge Glare Analysis Results

Site Configuration: Array 2-5 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 11:04 a.m.**
Updated **May 19, 2020 2:27 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39232.5043

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
A2 5	25.0	180.0	107	2,690	-

Component Data

PV Array(s)

Name: A2 5
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.897032	-74.149489	625.14	10.00	635.14
2	42.894570	-74.146882	679.71	10.00	689.71
3	42.893192	-74.147266	707.19	10.00	717.19
4	42.893211	-74.153536	688.46	10.00	698.46
5	42.894468	-74.154740	662.19	10.00	672.19

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 29	42.888530	-74.149500	829.82	16.00	845.82
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 56	42.890581	-74.147171	771.97	16.00	787.97
OP 73	42.892947	-74.141994	719.25	8.00	727.25
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A2 5	25.0	180.0	107	2,690	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A2 5 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 44	107	82
OP: OP 47	0	0
OP: OP 56	0	0
OP: OP 73	0	1225
OP: OP 76	0	1383

A2 5 - OP Receptor (OP 24)

No glare found

A2 5 - OP Receptor (OP 28)

No glare found

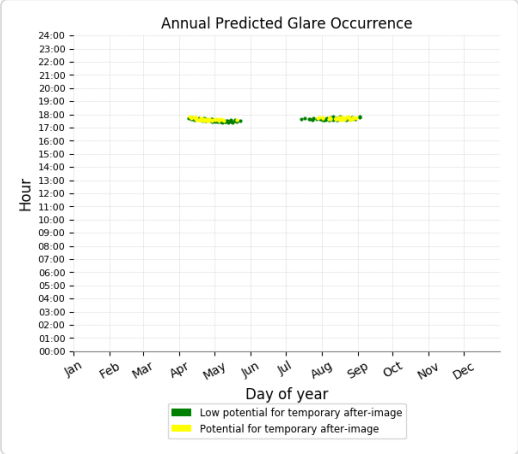
A2 5 - OP Receptor (OP 29)

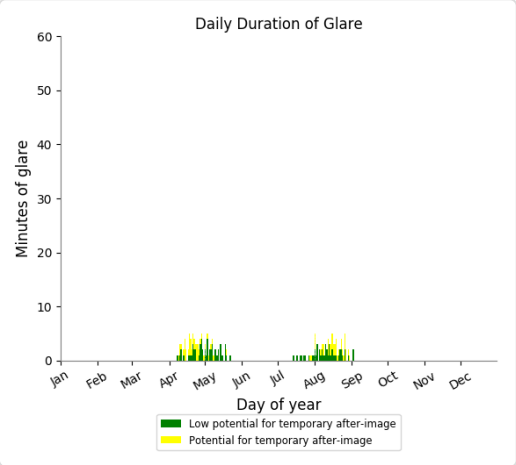
No glare found

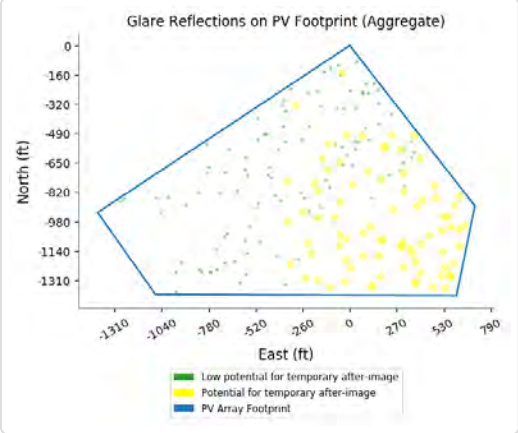
A2 5 - OP Receptor (OP 44)

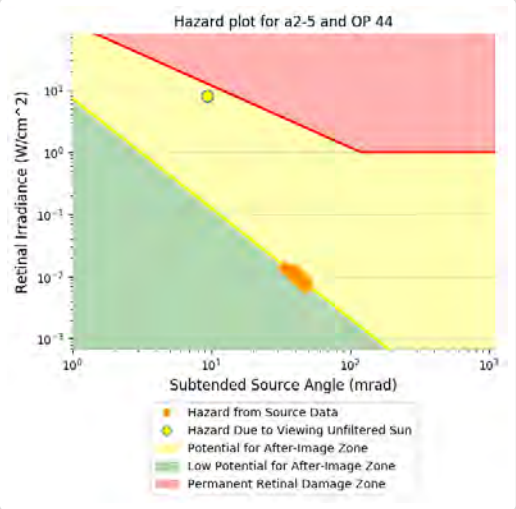
PV array is expected to produce the following glare for receptors at this location:

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









A2 5 - OP Receptor (OP 47)

No glare found

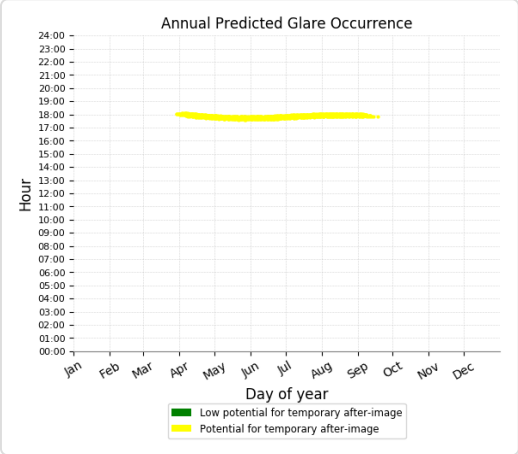
A2 5 - OP Receptor (OP 56)

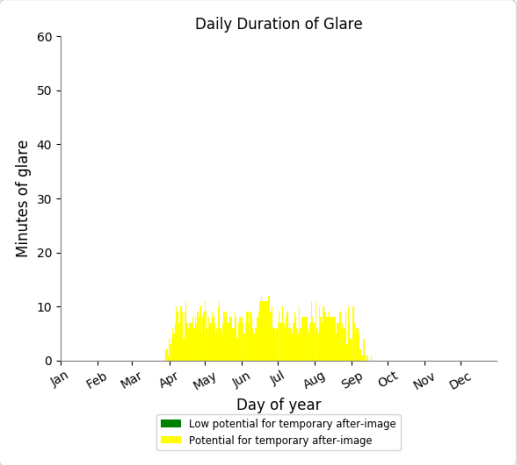
No glare found

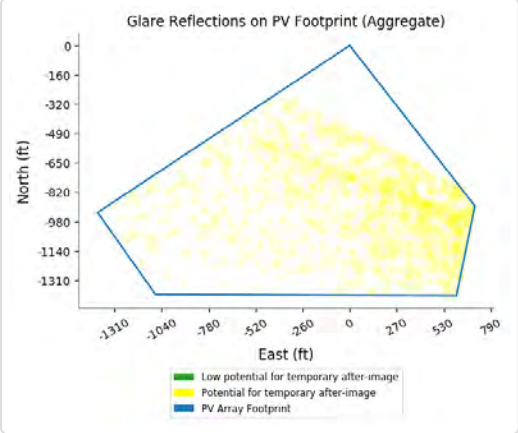
A2 5 - OP Receptor (OP 73)

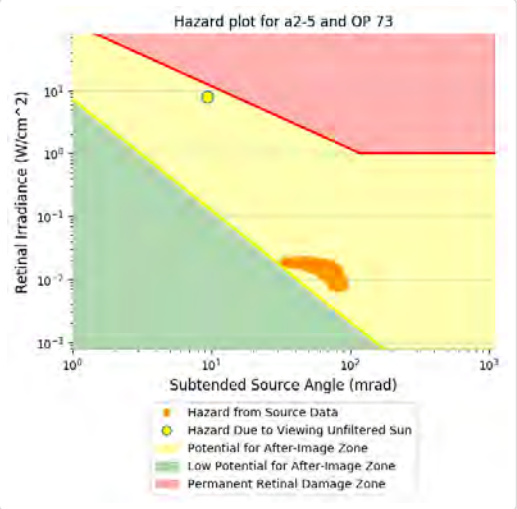
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,225 minutes of "yellow" glare with potential to cause temporary after-image.





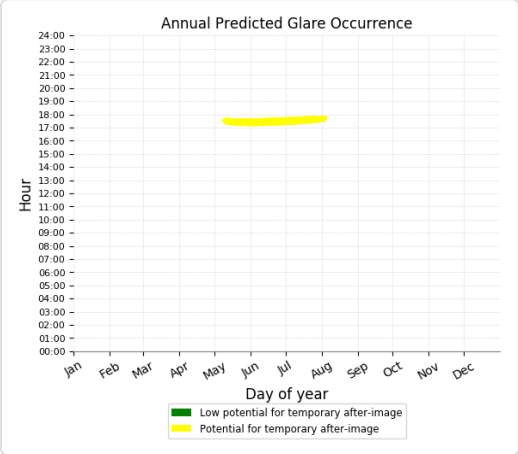


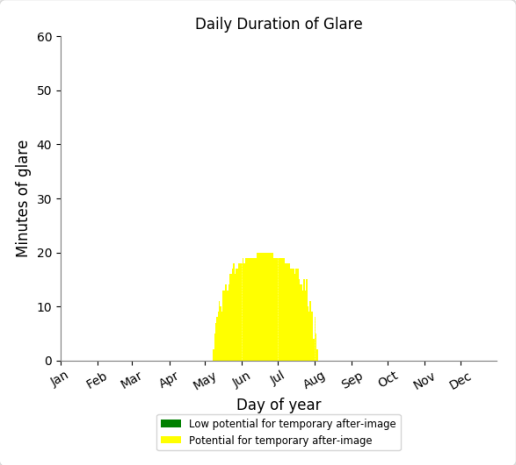


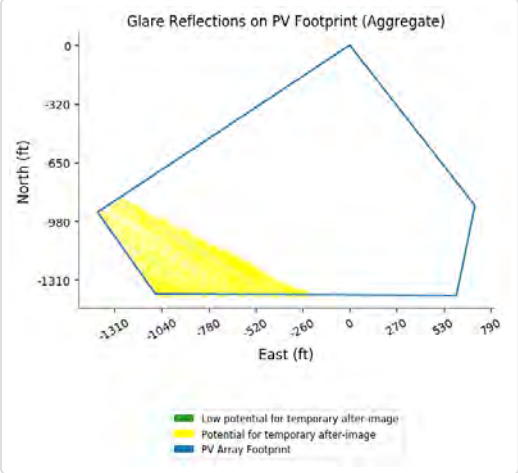
A2 5 - OP Receptor (OP 76)

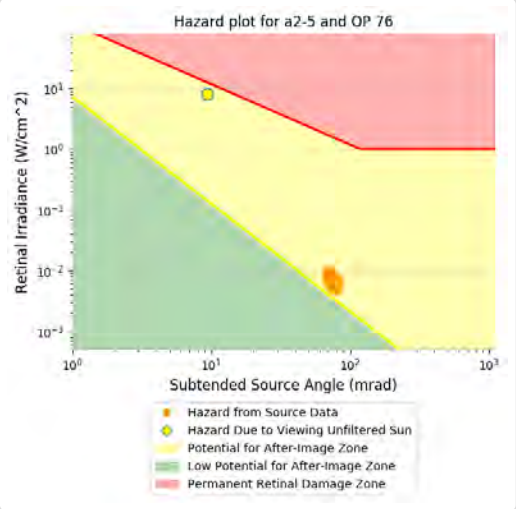
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,383 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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 2-6 Fixed May20

Project site configuration details and results.

Created **May 19, 2020 12:26 p.m.**
Updated **May 19, 2020 2:32 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39369.5043

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
A2 6	25.0	180.0	0	2,876	-

Component Data

PV Array(s)

Name: A2 6
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.893192	-74.147266	707.19	10.00	717.19
2	42.891435	-74.147755	747.54	10.00	757.54
3	42.890388	-74.149912	766.14	10.00	776.14
4	42.893209	-74.152615	689.16	10.00	699.16

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 2	42.907694	-74.149199	572.18	16.00	588.18
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 29	42.888530	-74.149500	829.82	16.00	845.82
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 56	42.890581	-74.147171	771.97	16.00	787.97
OP 72	42.889264	-74.149082	812.51	8.00	820.51

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A2 6	25.0	180.0	0	2,876	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A2 6 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 2	0	0
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 47	0	169
OP: OP 56	0	2707
OP: OP 72	0	0

A2 6 - OP Receptor (OP 2)

No glare found

A2 6 - OP Receptor (OP 24)

No glare found

A2 6 - OP Receptor (OP 28)

No glare found

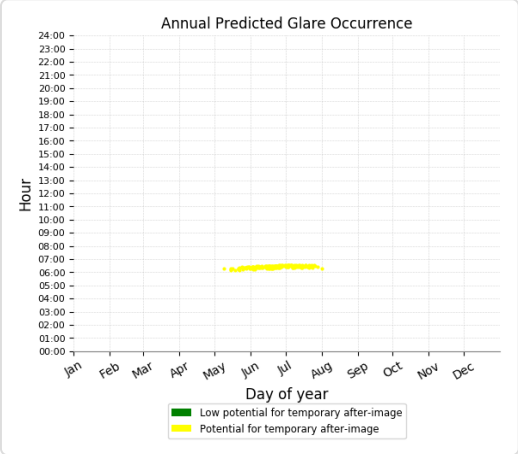
A2 6 - OP Receptor (OP 29)

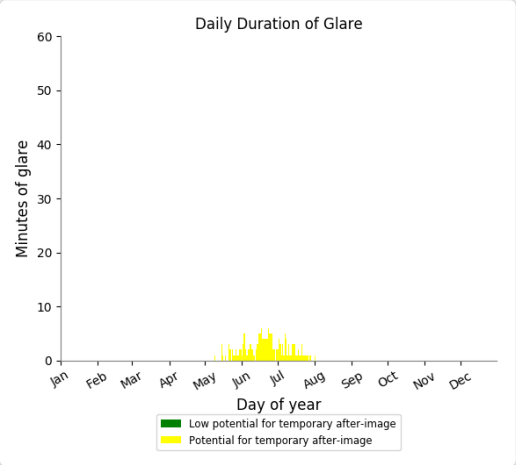
No glare found

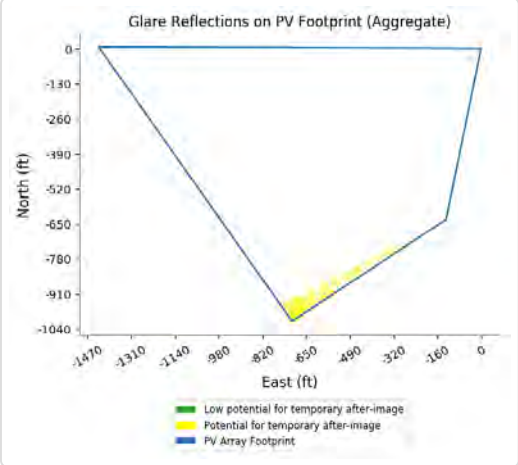
A2 6 - OP Receptor (OP 47)

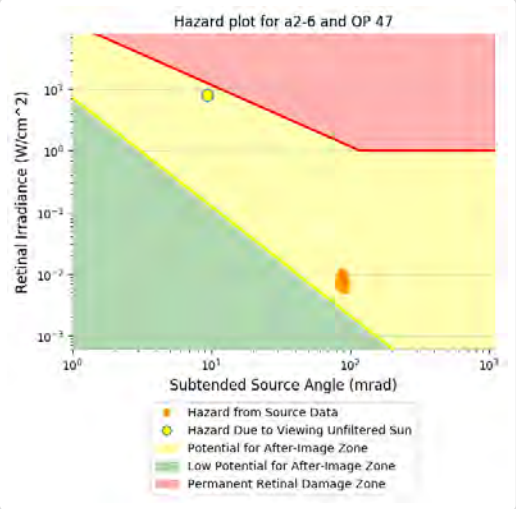
PV array is expected to produce the following glare for receptors at this location:

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





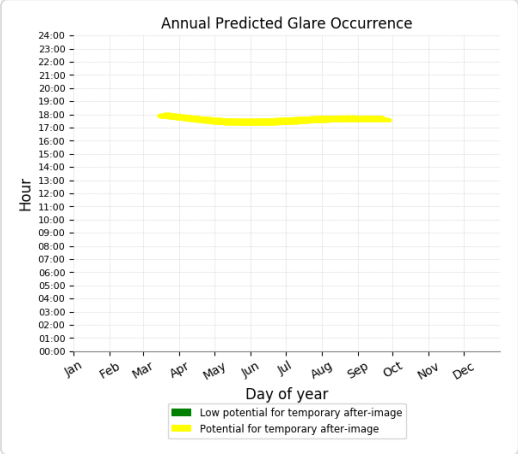


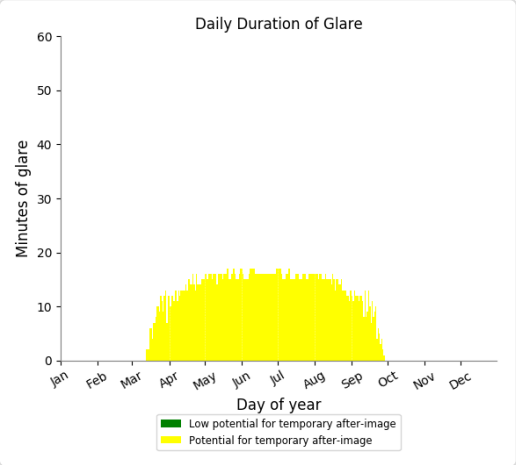


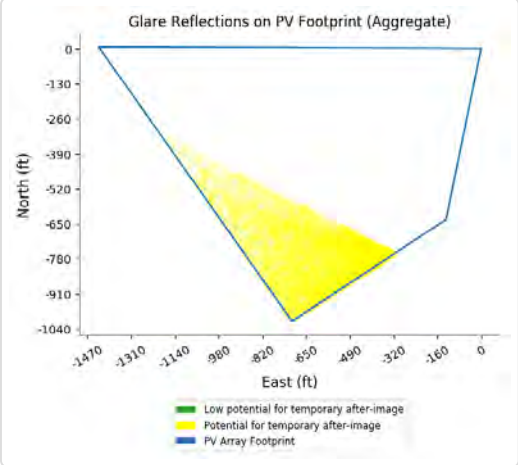
A2 6 - OP Receptor (OP 56)

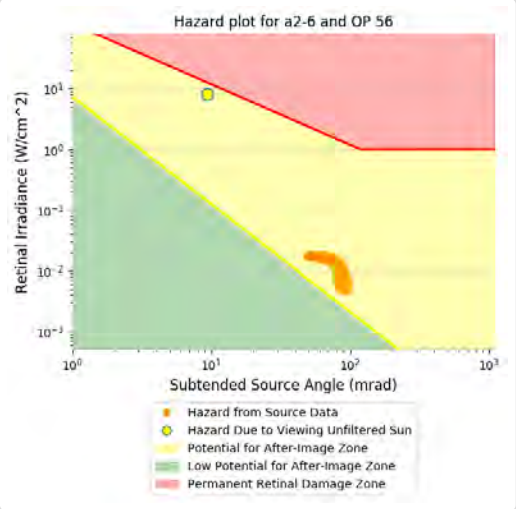
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,707 minutes of "yellow" glare with potential to cause temporary after-image.









A2 6 - OP Receptor (OP 72)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 2-7 Fixed May20

Project site configuration details and results.

Created **May 13, 2020 11:22 a.m.**
Updated **May 13, 2020 4:40 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39237.5043

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
A2 7	25.0	180.0	1,331	2,423	-

Component Data

PV Array(s)

Name: A2 7
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.897501	-74.148473	619.64	10.00	629.64
2	42.897491	-74.145147	617.08	10.00	627.09
3	42.895126	-74.145161	661.58	10.00	671.58
4	42.894061	-74.145602	684.46	10.00	694.46
5	42.894570	-74.146882	679.71	10.00	689.71
6	42.896080	-74.148481	645.50	10.00	655.50

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 7	42.895080	-74.138024	656.83	16.00	672.83
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 29	42.888530	-74.149500	829.82	16.00	845.82
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 72	42.889264	-74.149082	812.51	8.00	820.51
OP 74	42.895349	-74.135464	631.08	8.00	639.08
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A2 7	25.0	180.0	1,331	2,423	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

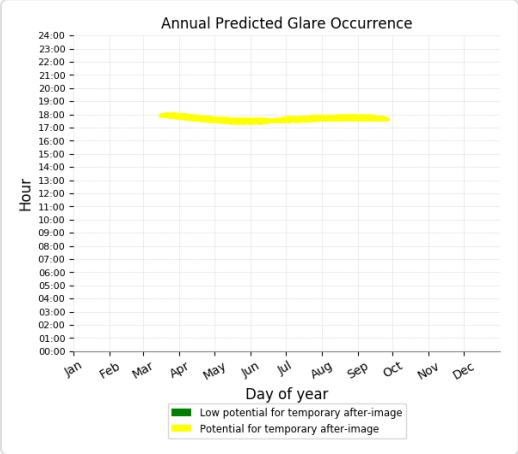
A2 7 potential temporary after-image

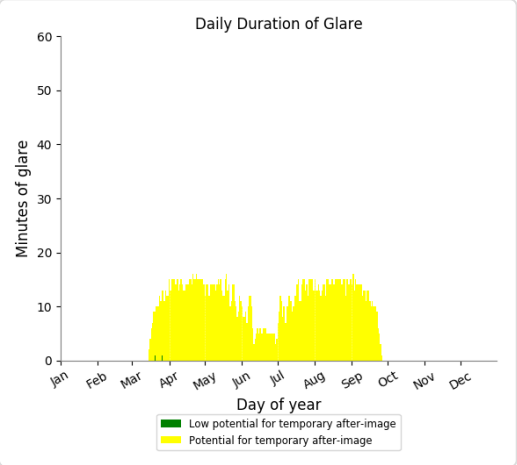
Component	Green glare (min)	Yellow glare (min)
OP: OP 7	2	2277
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 44	1317	0
OP: OP 47	0	0
OP: OP 72	0	0
OP: OP 74	12	146
OP: OP 76	0	0

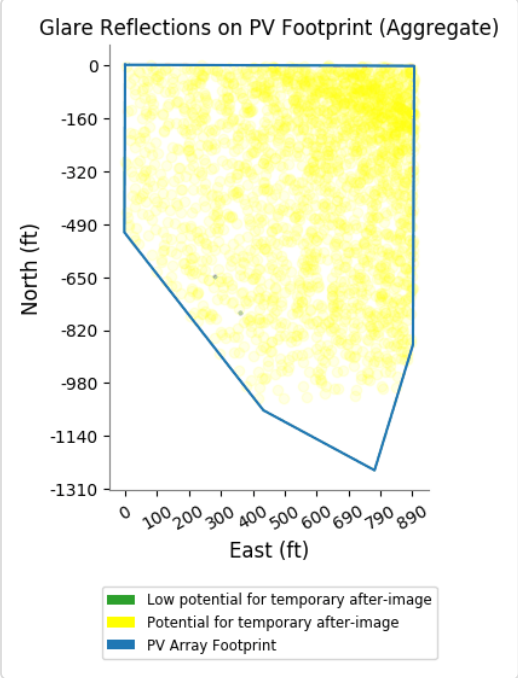
A2 7 - OP Receptor (OP 7)

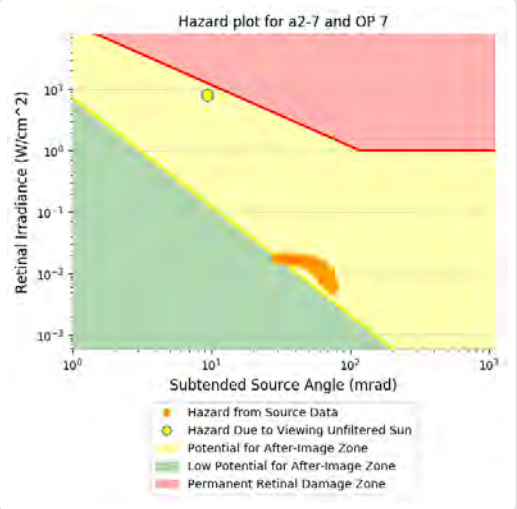
PV array is expected to produce the following glare for receptors at this location:

- 2 minutes of "green" glare with low potential to cause temporary after-image.
- 2,277 minutes of "yellow" glare with potential to cause temporary after-image.









A2 7 - OP Receptor (OP 24)

No glare found

A2 7 - OP Receptor (OP 28)

No glare found

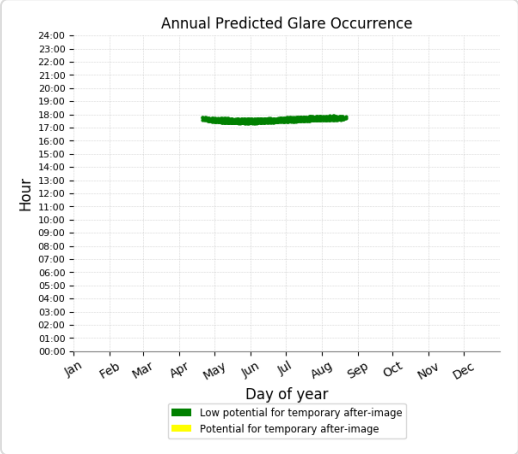
A2 7 - OP Receptor (OP 29)

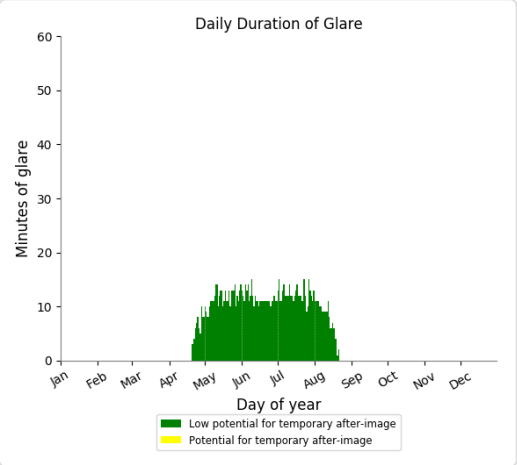
No glare found

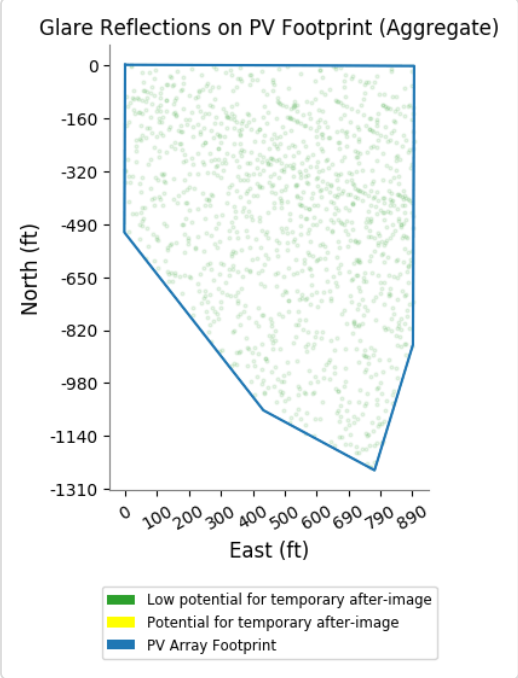
A2 7 - OP Receptor (OP 44)

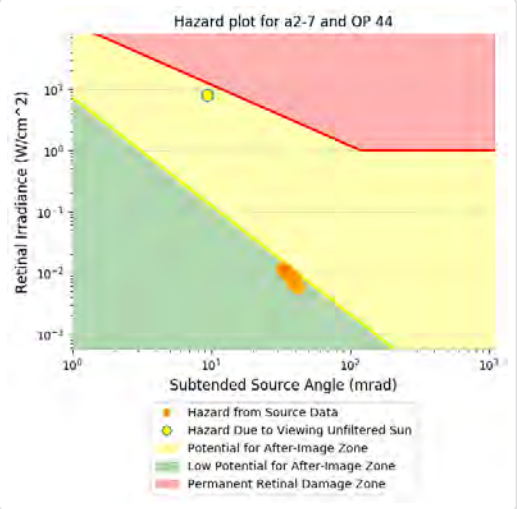
PV array is expected to produce the following glare for receptors at this location:

- 1,317 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.









A2 7 - OP Receptor (OP 47)

No glare found

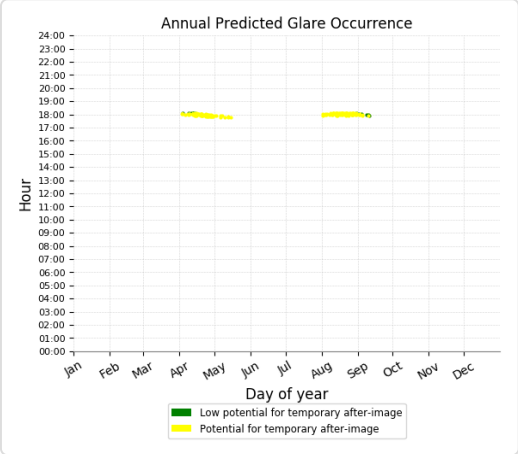
A2 7 - OP Receptor (OP 72)

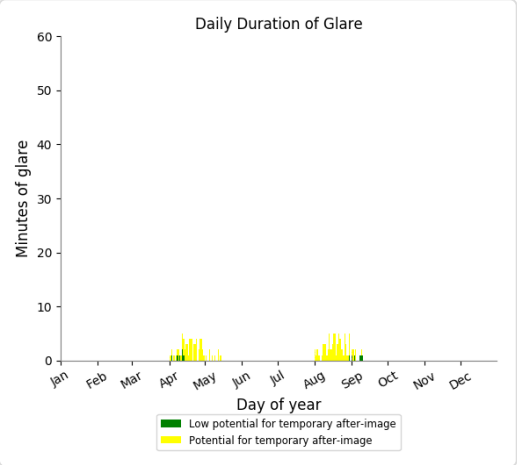
No glare found

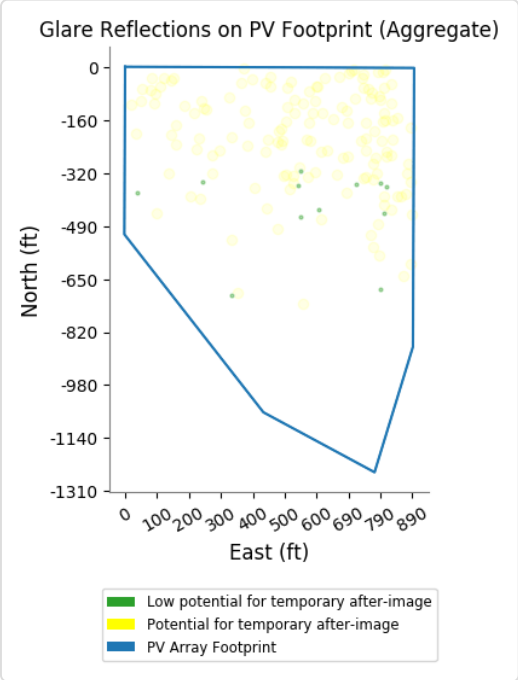
A2 7 - OP Receptor (OP 74)

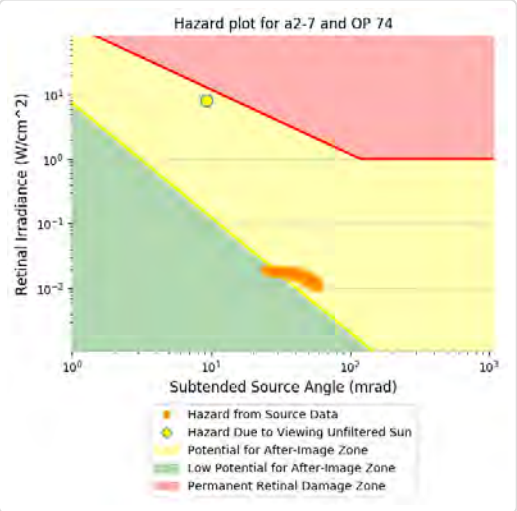
PV array is expected to produce the following glare for receptors at this location:

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









A2 7 - OP Receptor (OP 76)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 3-1 Tracking May20

Project site configuration details and results.

Created **May 12, 2020 11:19 a.m.**
Updated **May 19, 2020 3 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39156.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A3 1	SA tracking	SA tracking	0	0	-

Component Data

PV Array(s)

Name: A3 1
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0 deg
Tracking axis tilt: 0.0 deg
Tracking axis panel offset: 0.0 deg
Maximum tracking angle: 60.0 deg
Resting angle: 5.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.899823	-74.150234	593.55	13.00	606.55
2	42.900392	-74.150230	590.49	13.00	603.49
3	42.903685	-74.145236	596.28	13.00	609.28
4	42.903676	-74.142268	602.26	13.00	615.26
5	42.899799	-74.142290	594.51	13.00	607.51
6	42.899808	-74.145260	596.69	13.00	609.69

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 6	42.895017	-74.138592	654.09	16.00	670.09
OP 7	42.895080	-74.138024	656.83	16.00	672.83
OP 8	42.895209	-74.137643	652.44	16.00	668.44
OP 9	42.895449	-74.137219	645.32	16.00	661.32
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 15	42.900923	-74.133373	528.45	16.00	544.45
OP 18	42.897823	-74.133705	597.16	16.00	613.16
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 29	42.888530	-74.149500	829.82	16.00	845.82
OP 33	42.895612	-74.128218	603.88	16.00	619.88
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 67	42.895682	-74.121979	595.90	8.00	603.90
OP 68	42.894759	-74.118727	613.34	8.00	621.34
OP 69	42.896354	-74.124360	587.02	8.00	595.02
OP 73	42.892947	-74.141994	719.25	8.00	727.25
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A3 1	SA tracking	SA tracking	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A3 1 no glare found

Component	Green glare (min)	Yellow glare (min)
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 15	0	0
OP: OP 18	0	0
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 33	0	0
OP: OP 40	0	0
OP: OP 43	0	0
OP: OP 44	0	0
OP: OP 47	0	0
OP: OP 67	0	0
OP: OP 68	0	0
OP: OP 69	0	0
OP: OP 73	0	0
OP: OP 76	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 3-2 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 11:19 a.m.**
Updated **May 13, 2020 11:52 a.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39157.5043

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
A3 2	25.0	180.0	678	14,360	-

Component Data

PV Array(s)

Name: A3 2
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.903667	-74.139447	602.74	10.00	612.74
2	42.901419	-74.137325	536.16	10.00	546.16
3	42.900681	-74.138569	556.70	10.00	566.70
4	42.899794	-74.140855	589.65	10.00	599.65
5	42.899799	-74.142290	594.51	10.00	604.51
6	42.903676	-74.142268	602.26	10.00	612.26

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 6	42.895017	-74.138592	654.09	16.00	670.09
OP 7	42.895080	-74.138024	656.83	16.00	672.83
OP 8	42.895209	-74.137643	652.44	16.00	668.44
OP 9	42.895449	-74.137219	645.32	16.00	661.32
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 14	42.901646	-74.134145	520.67	16.00	536.67
OP 15	42.900923	-74.133373	528.45	16.00	544.45
OP 18	42.897823	-74.133705	597.16	16.00	613.16
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 29	42.888530	-74.149500	829.82	16.00	845.82
OP 33	42.895612	-74.128218	603.88	16.00	619.88
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 47	42.889832	-74.151972	774.94	16.00	790.94
OP 67	42.895682	-74.121979	595.90	8.00	603.90
OP 69	42.896354	-74.124360	587.02	8.00	595.02
OP 73	42.892947	-74.141994	719.25	8.00	727.25
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A3 2	25.0	180.0	678	14,360	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A3 2 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
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 14	0	2559
OP: OP 15	0	2272
OP: OP 18	0	1487
OP: OP 24	0	0
OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 33	0	900
OP: OP 40	247	1643
OP: OP 43	431	1547
OP: OP 44	0	0
OP: OP 47	0	0
OP: OP 67	0	1909
OP: OP 69	0	2043
OP: OP 73	0	0
OP: OP 76	0	0

A3 2 - OP Receptor (OP 6)

No glare found

A3 2 - OP Receptor (OP 7)

No glare found

A3 2 - OP Receptor (OP 8)

No glare found

A3 2 - OP Receptor (OP 9)

No glare found

A3 2 - OP Receptor (OP 10)

No glare found

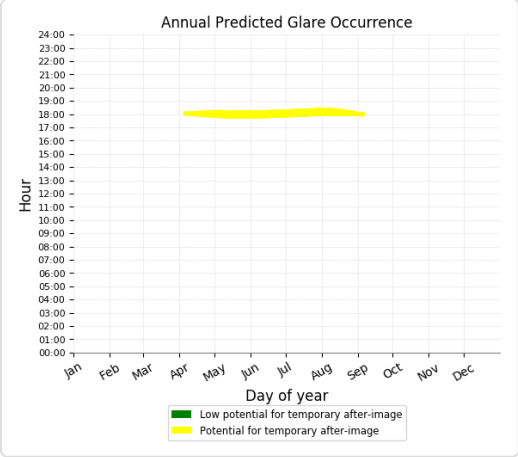
A3 2 - OP Receptor (OP 11)

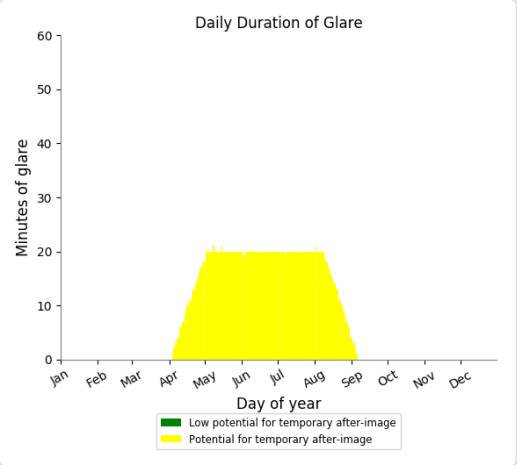
No glare found

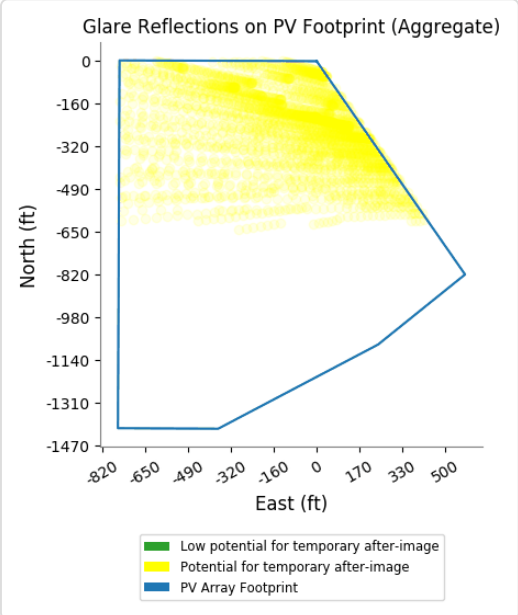
A3 2 - OP Receptor (OP 14)

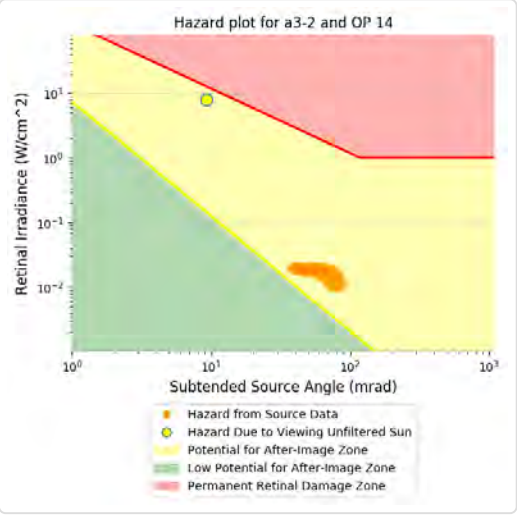
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,559 minutes of "yellow" glare with potential to cause temporary after-image.





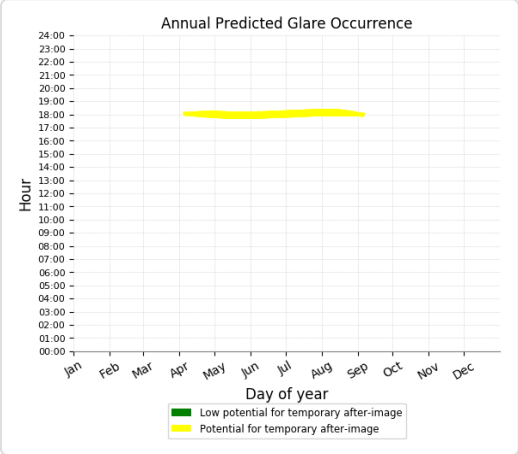


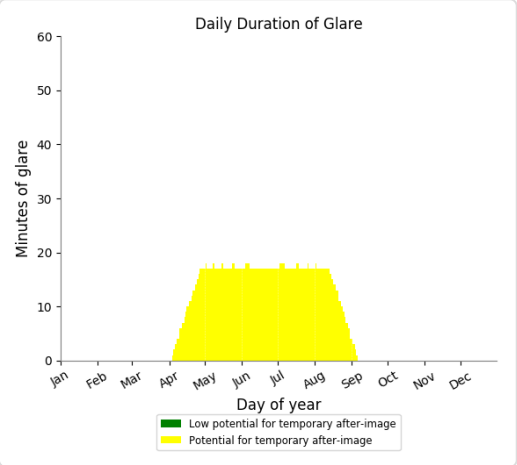


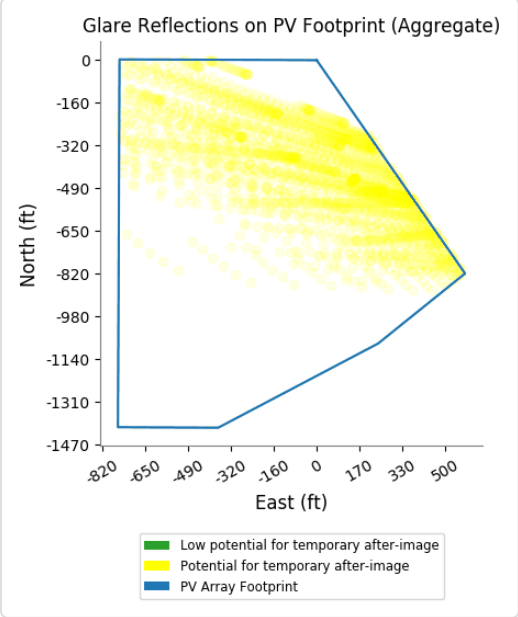
A3 2 - OP Receptor (OP 15)

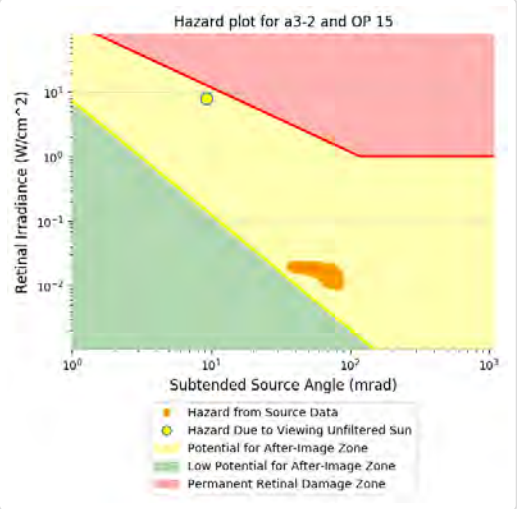
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,272 minutes of "yellow" glare with potential to cause temporary after-image.





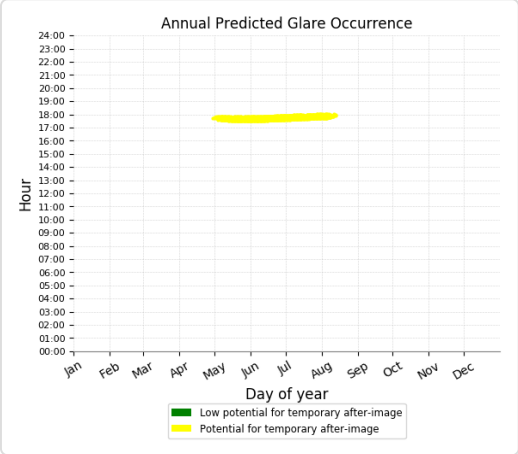


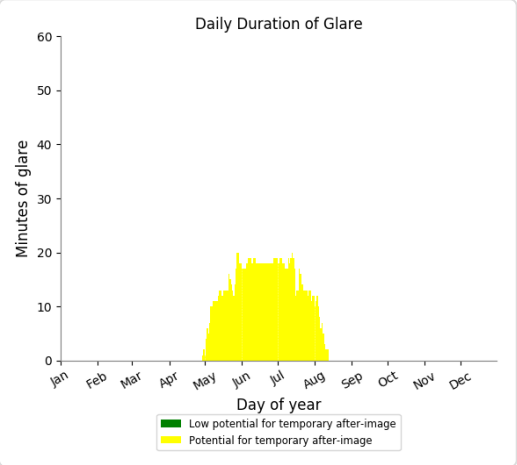


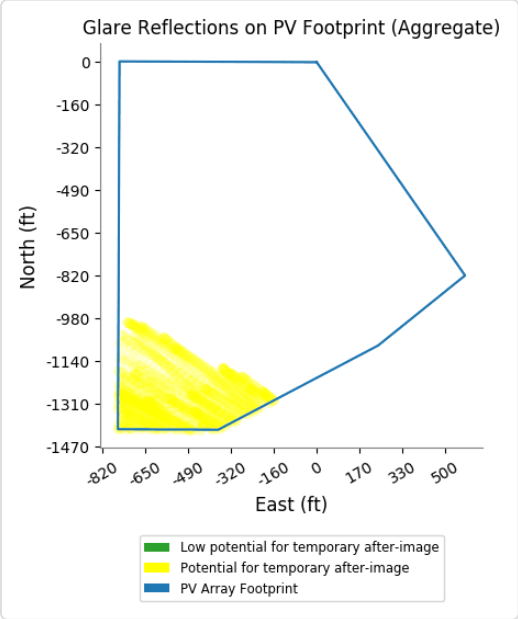
A3 2 - OP Receptor (OP 18)

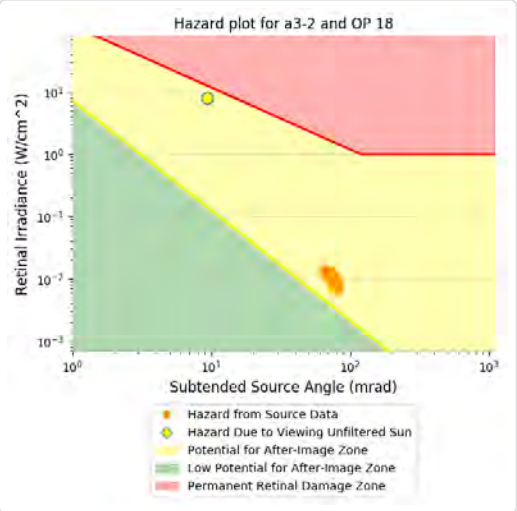
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,487 minutes of "yellow" glare with potential to cause temporary after-image.









A3 2 - OP Receptor (OP 24)

No glare found

A3 2 - OP Receptor (OP 28)

No glare found

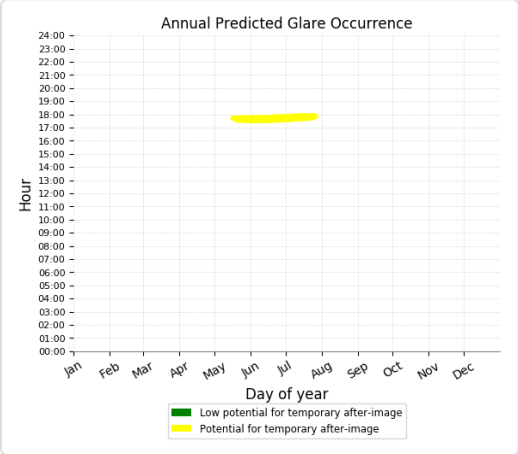
A3 2 - OP Receptor (OP 29)

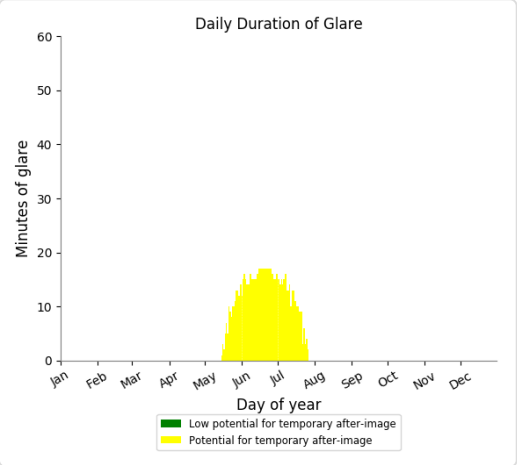
No glare found

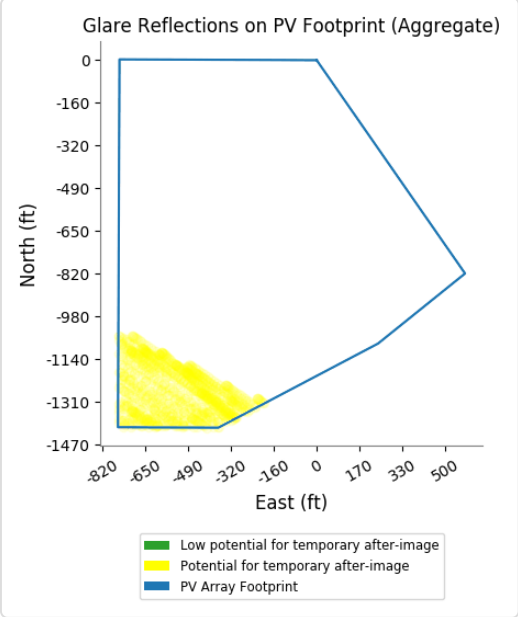
A3 2 - OP Receptor (OP 33)

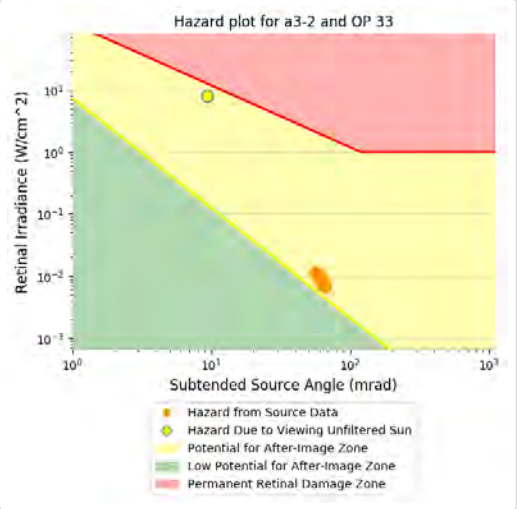
PV array is expected to produce the following glare for receptors at this location:

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





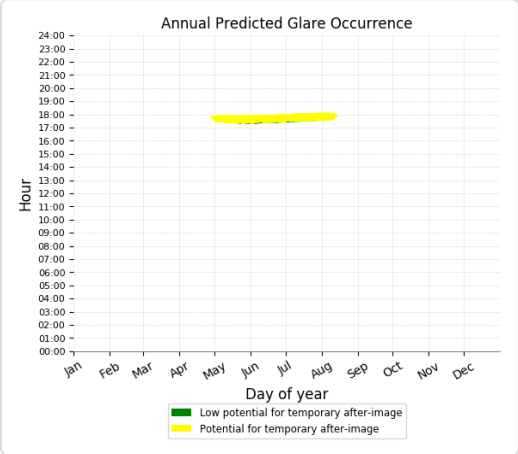


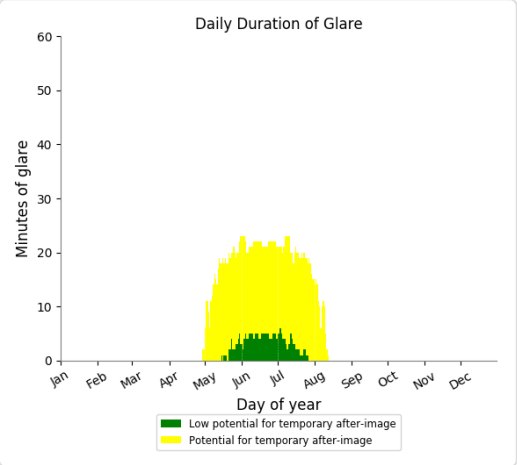


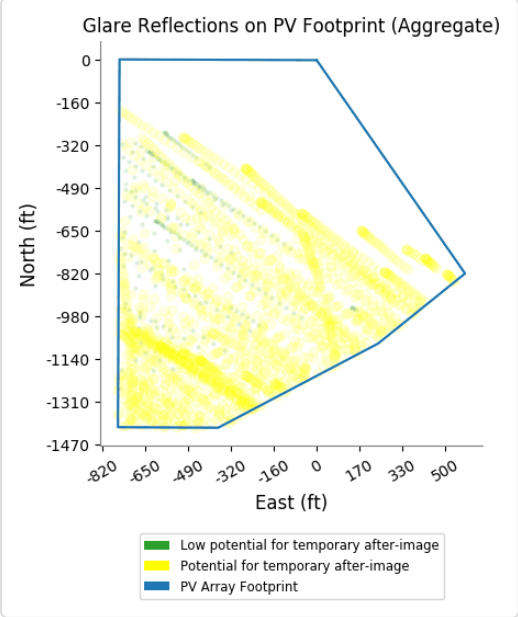
A3 2 - OP Receptor (OP 40)

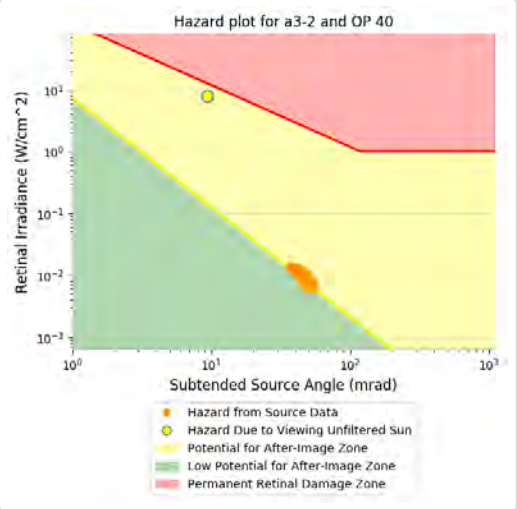
PV array is expected to produce the following glare for receptors at this location:

- 247 minutes of "green" glare with low potential to cause temporary after-image.
- 1,643 minutes of "yellow" glare with potential to cause temporary after-image.





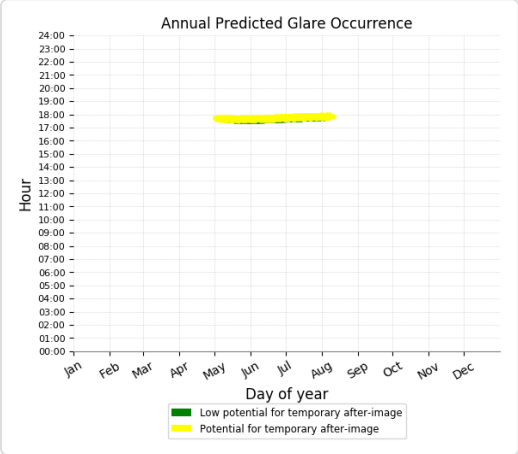


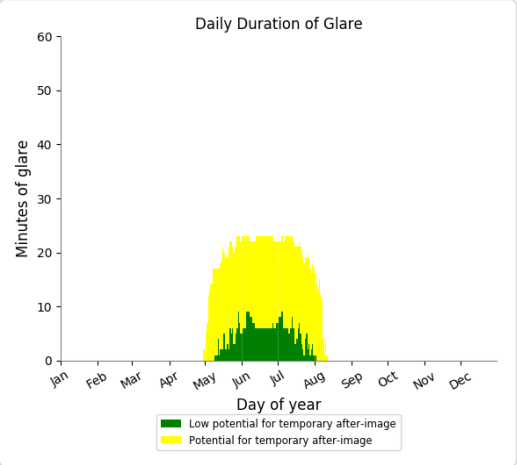


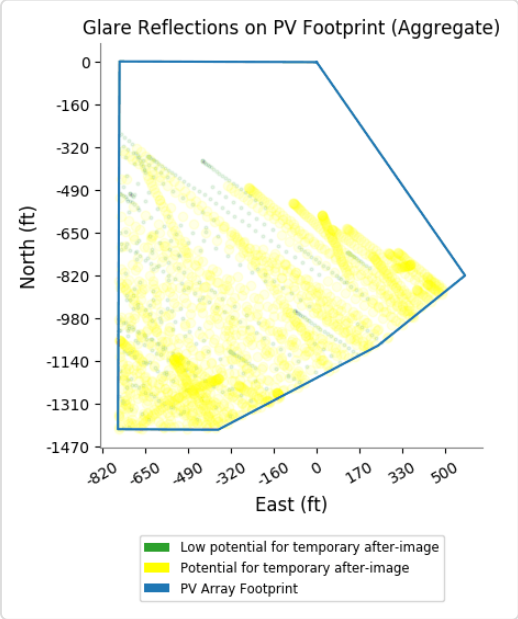
A3 2 - OP Receptor (OP 43)

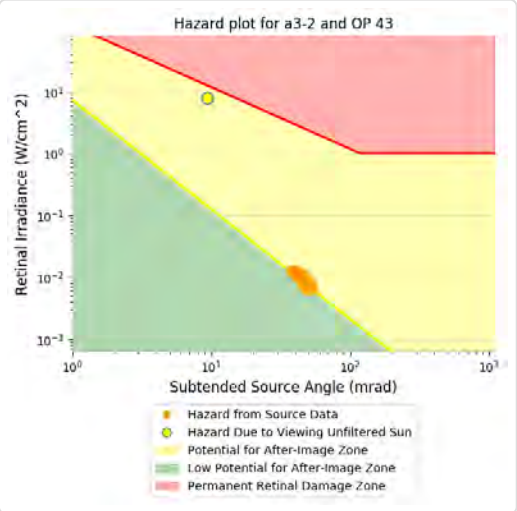
PV array is expected to produce the following glare for receptors at this location:

- 431 minutes of "green" glare with low potential to cause temporary after-image.
- 1,547 minutes of "yellow" glare with potential to cause temporary after-image.









A3 2 - OP Receptor (OP 44)

No glare found

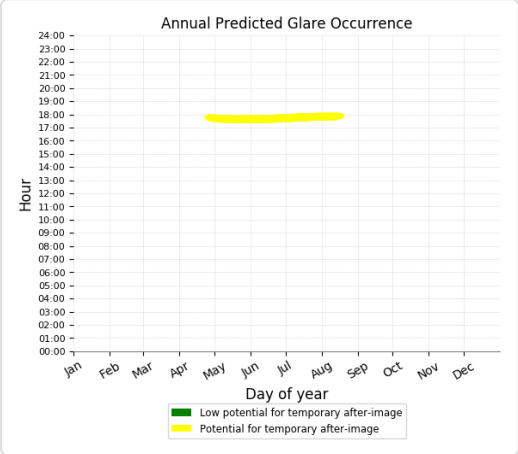
A3 2 - OP Receptor (OP 47)

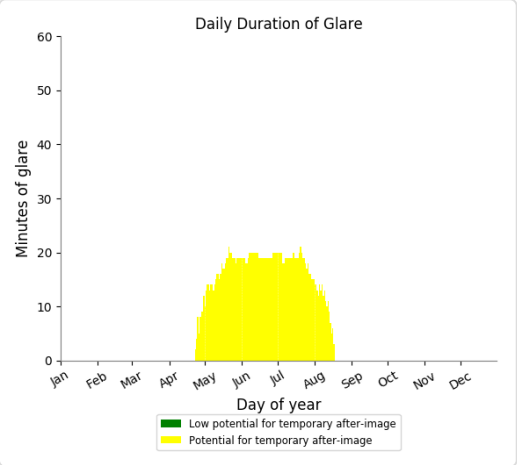
No glare found

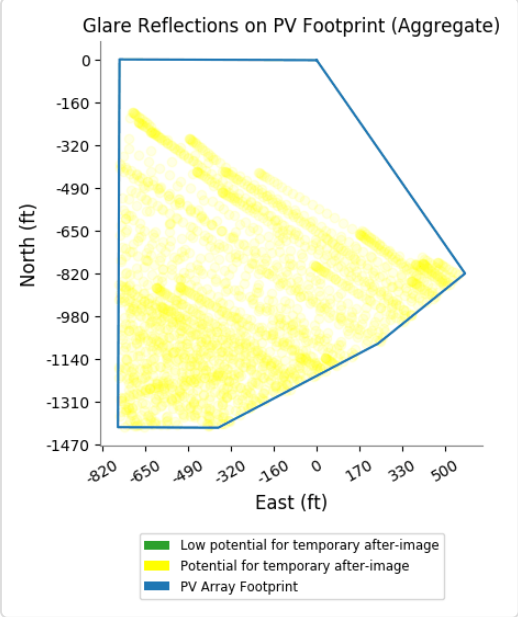
A3 2 - OP Receptor (OP 67)

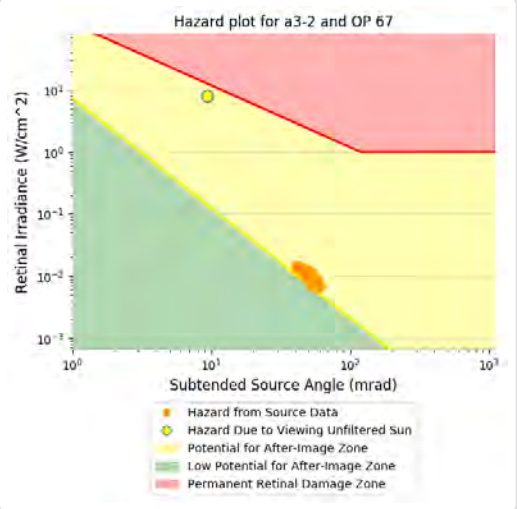
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,909 minutes of "yellow" glare with potential to cause temporary after-image.





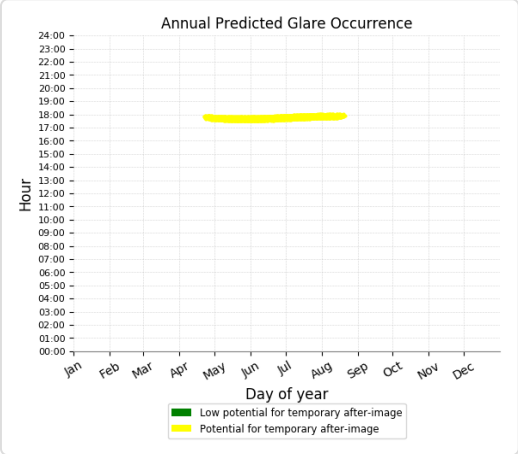


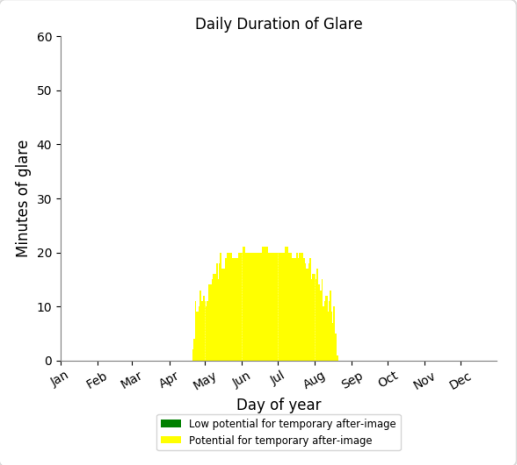


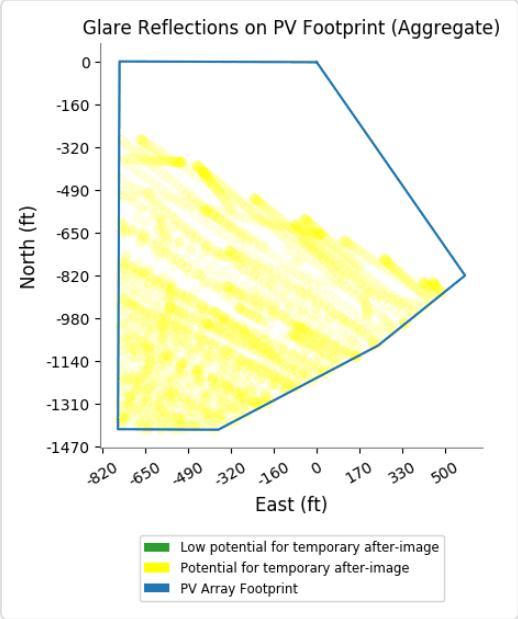
A3 2 - OP Receptor (OP 69)

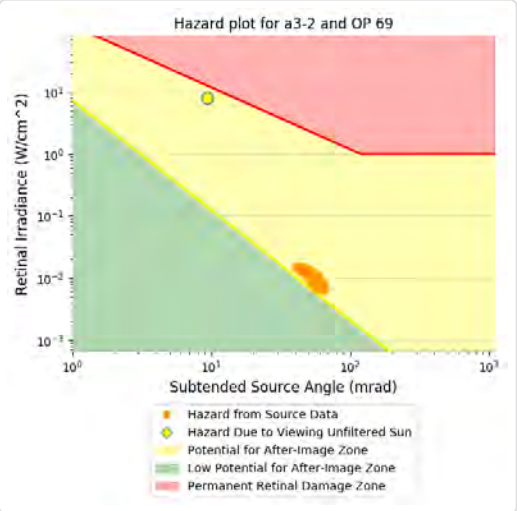
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,043 minutes of "yellow" glare with potential to cause temporary after-image.









A3 2 - OP Receptor (OP 73)

No glare found

A3 2 - OP Receptor (OP 76)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 3-3 Tracking May20

Project site configuration details and results.

Created **May 12, 2020 11:19 a.m.**
Updated **May 19, 2020 2:55 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39158.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A3 3	SA tracking	SA tracking	0	0	-

Component Data

PV Array(s)

Name: A3 3
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0 deg
Tracking axis tilt: 0.0 deg
Tracking axis panel offset: 0.0 deg
Maximum tracking angle: 60.0 deg
Resting angle: 5.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.899809	-74.145450	597.00	13.00	610.00
2	42.897719	-74.146963	616.78	13.00	629.78
3	42.897725	-74.148908	613.72	13.00	626.72
4	42.899819	-74.148896	595.20	13.00	608.20

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 6	42.895017	-74.138592	654.09	16.00	670.09
OP 7	42.895080	-74.138024	656.83	16.00	672.83
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 73	42.892947	-74.141994	719.25	8.00	727.25
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A3 3	SA tracking	SA tracking	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A3 3 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 6	0	0
OP: OP 7	0	0
OP: OP 11	0	0
OP: OP 40	0	0
OP: OP 43	0	0
OP: OP 73	0	0
OP: OP 76	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 3-4 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 11:19 a.m.**
Updated **May 13, 2020 noon**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39159.5043

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
A3 4	25.0	180.0	1,609	7,197	-

Component Data

PV Array(s)

Name: A3 4
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.899593	-74.140051	574.28	10.00	584.28
2	42.898322	-74.140059	599.94	10.00	609.94
3	42.897553	-74.142440	610.45	10.00	620.45
4	42.897098	-74.144323	621.33	10.00	631.33
5	42.899170	-74.144311	593.15	10.00	603.15

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 7	42.895080	-74.138024	656.83	16.00	672.83
OP 9	42.895449	-74.137219	645.32	16.00	661.32
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 73	42.892947	-74.141994	719.25	8.00	727.25
OP 76	42.890096	-74.142190	830.22	8.00	838.22

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A3 4	25.0	180.0	1,609	7,197	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

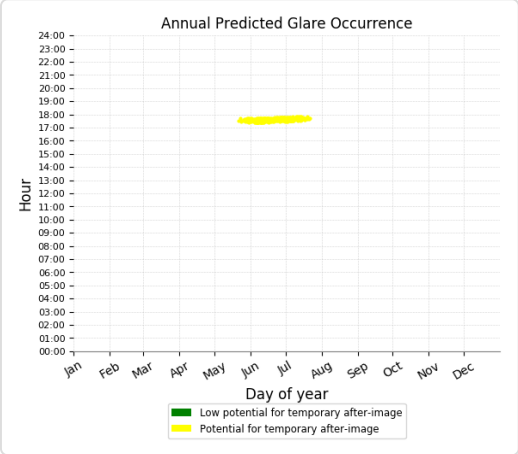
A3 4 potential temporary after-image

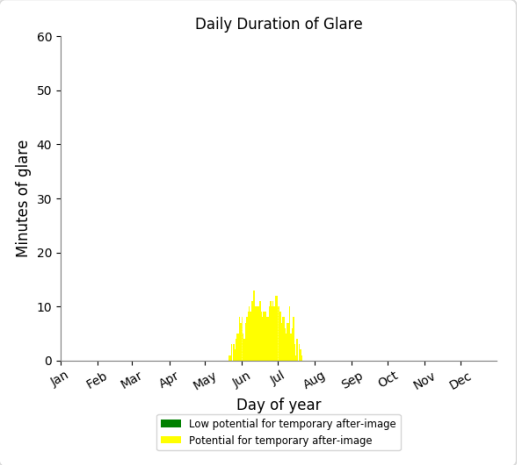
Component	Green glare (min)	Yellow glare (min)
OP: OP 7	0	441
OP: OP 9	0	1436
OP: OP 10	0	2636
OP: OP 11	1	2684
OP: OP 24	0	0
OP: OP 40	454	0
OP: OP 43	538	0
OP: OP 44	616	0
OP: OP 73	0	0
OP: OP 76	0	0

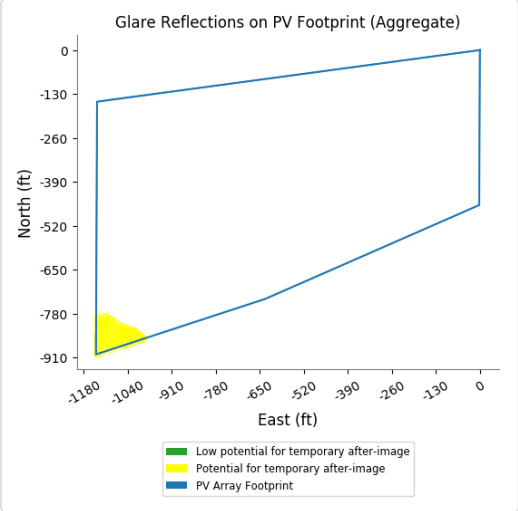
A3 4 - OP Receptor (OP 7)

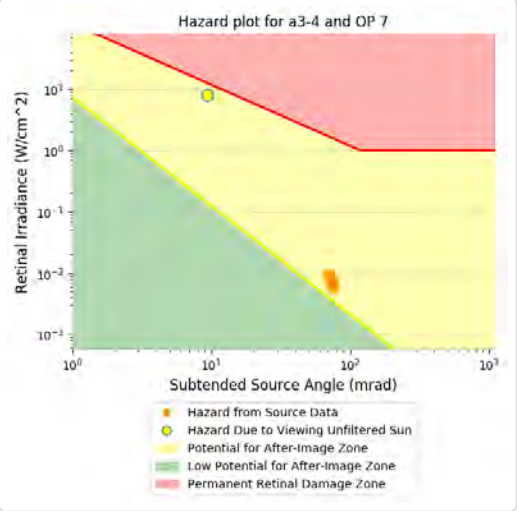
PV array is expected to produce the following glare for receptors at this location:

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





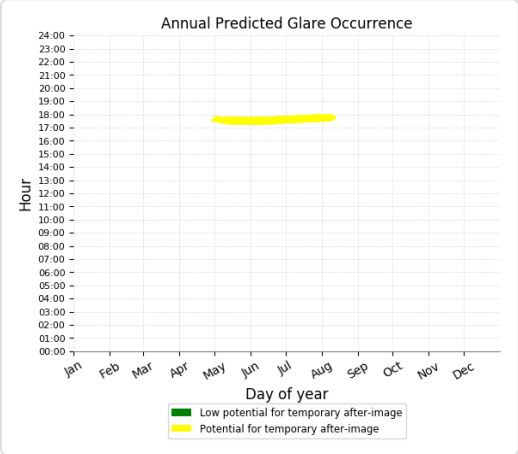


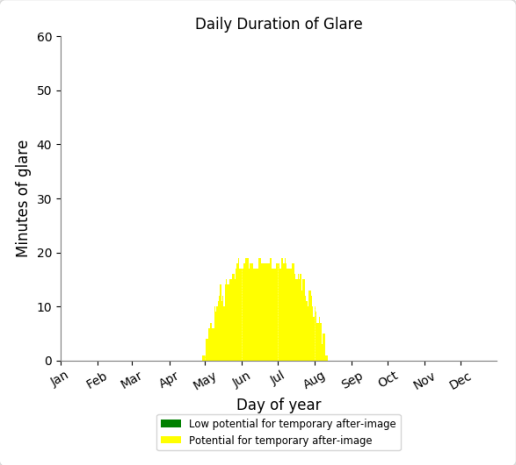


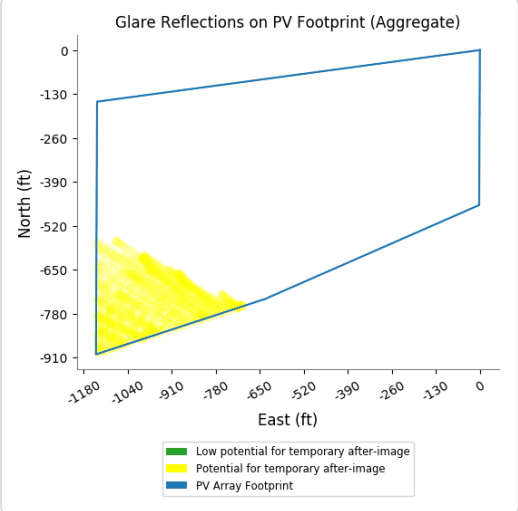
A3 4 - OP Receptor (OP 9)

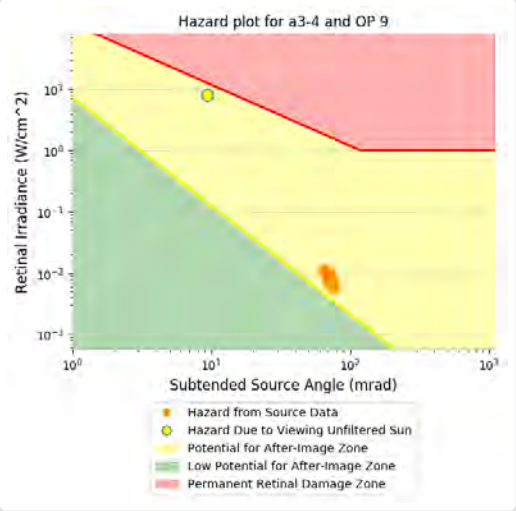
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,436 minutes of "yellow" glare with potential to cause temporary after-image.





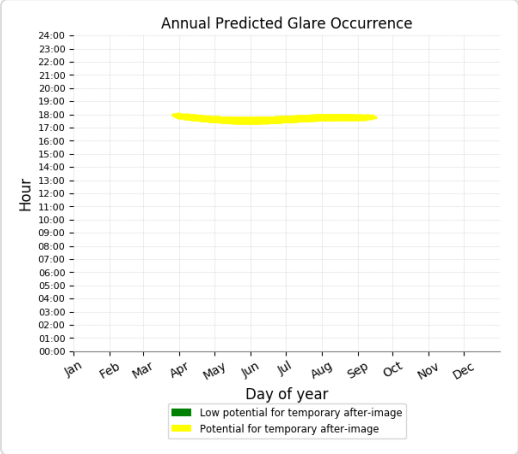


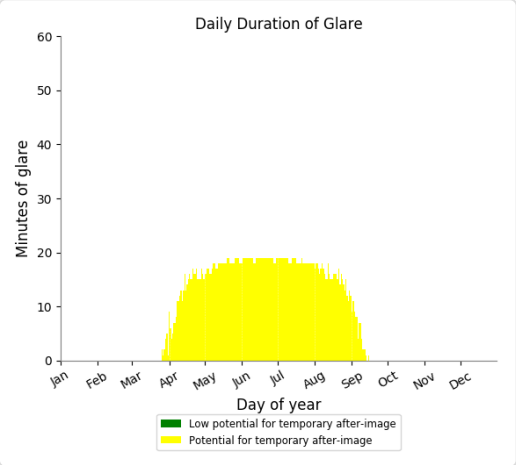


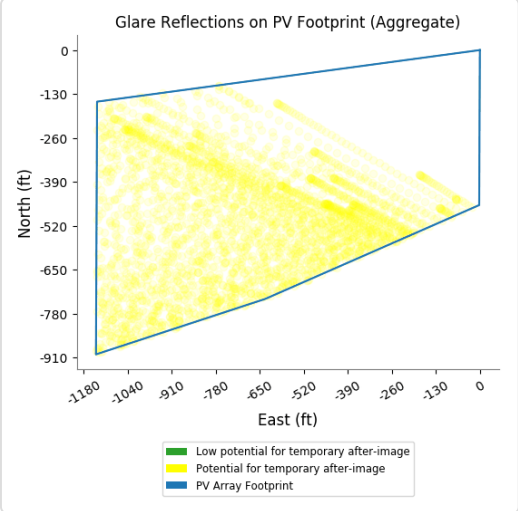
A3 4 - OP Receptor (OP 10)

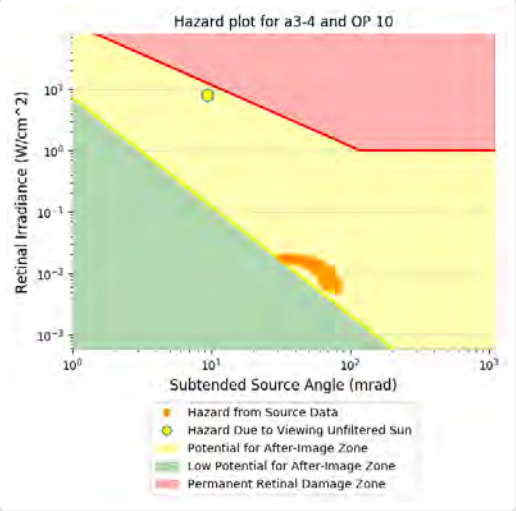
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,636 minutes of "yellow" glare with potential to cause temporary after-image.





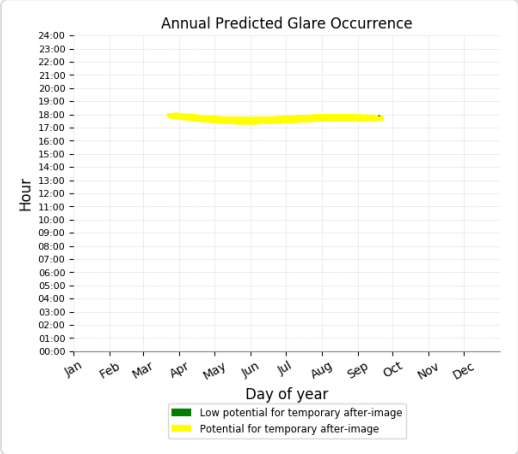


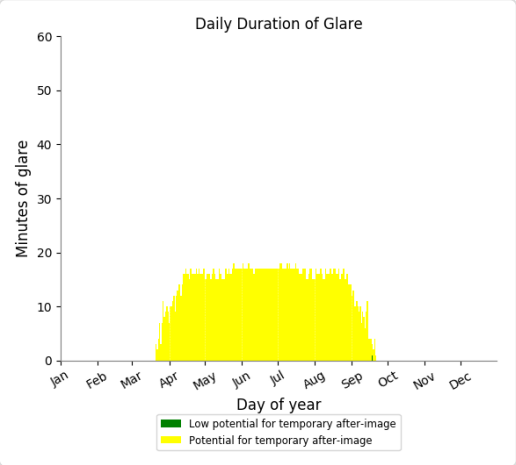


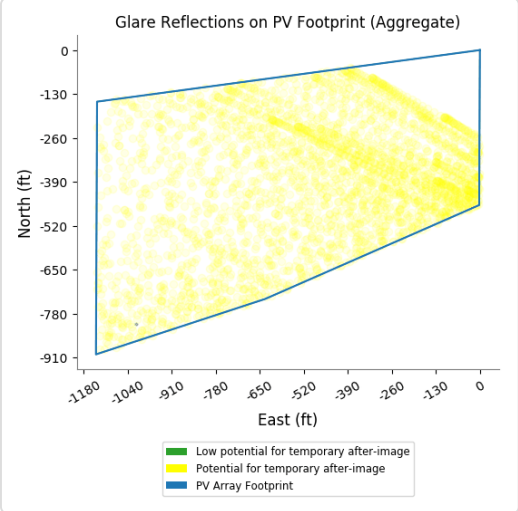
A3 4 - OP Receptor (OP 11)

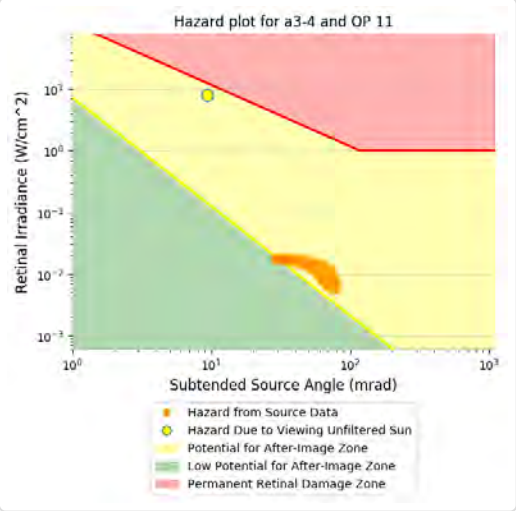
PV array is expected to produce the following glare for receptors at this location:

- 1 minutes of "green" glare with low potential to cause temporary after-image.
- 2,684 minutes of "yellow" glare with potential to cause temporary after-image.









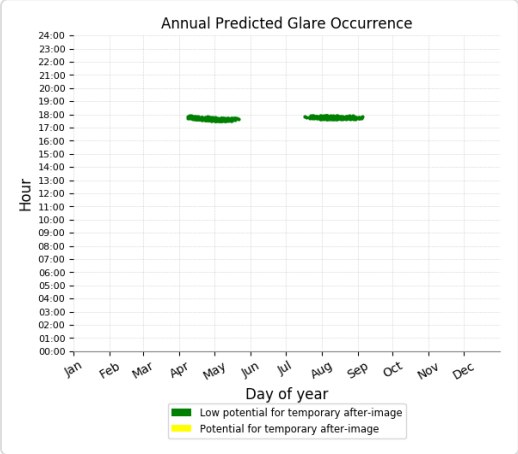
A3 4 - OP Receptor (OP 24)

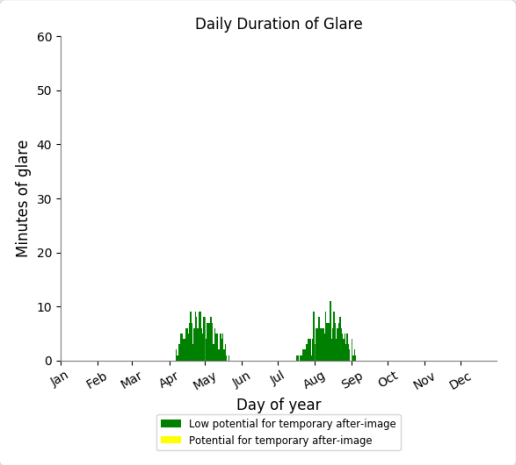
No glare found

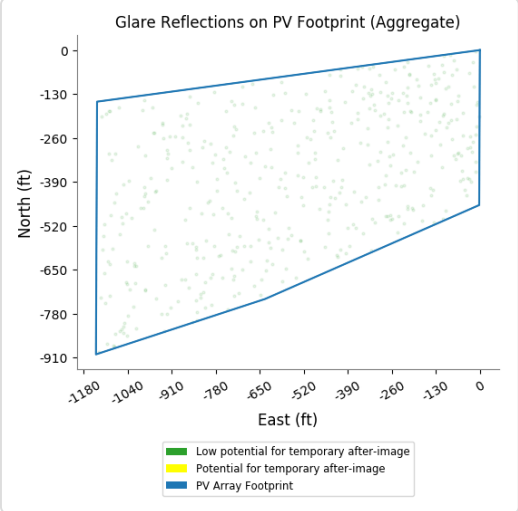
A3 4 - OP Receptor (OP 40)

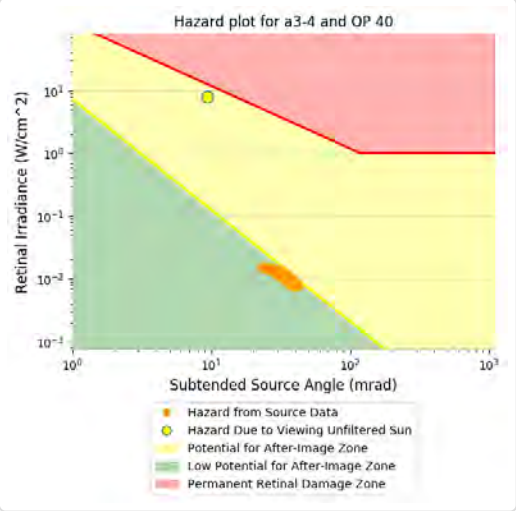
PV array is expected to produce the following glare for receptors at this location:

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





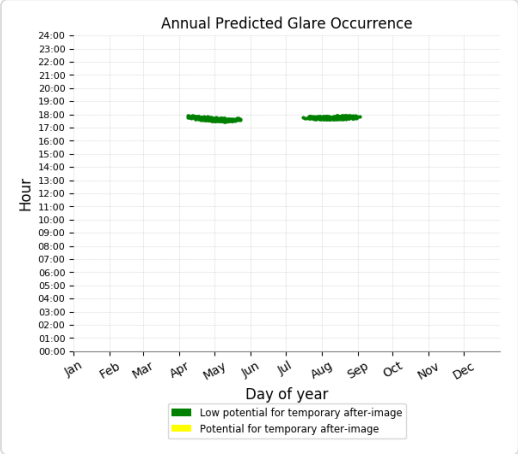


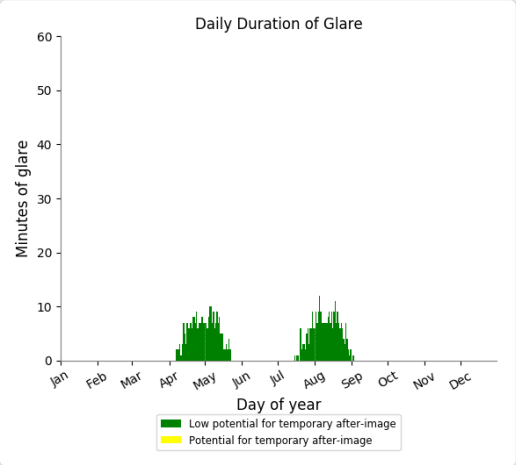


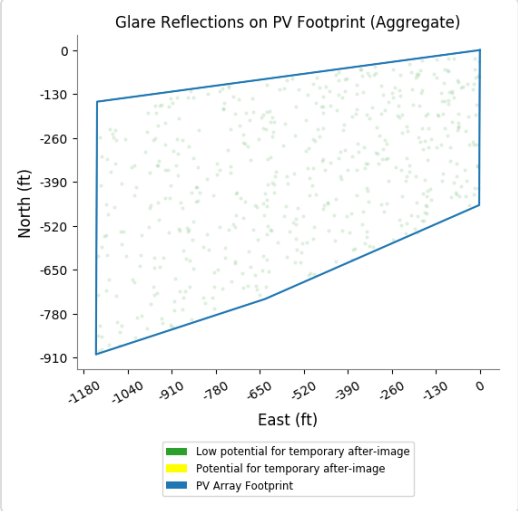
A3 4 - OP Receptor (OP 43)

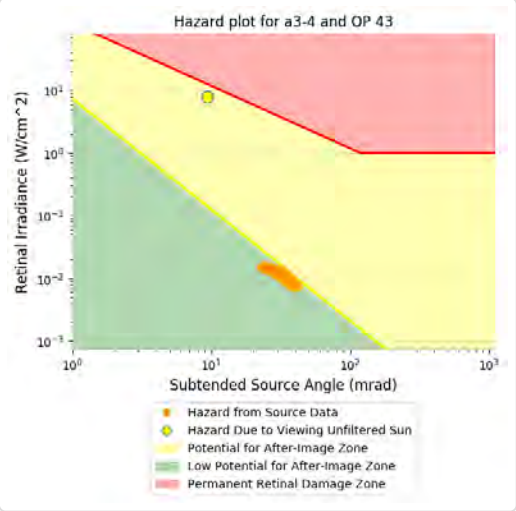
PV array is expected to produce the following glare for receptors at this location:

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





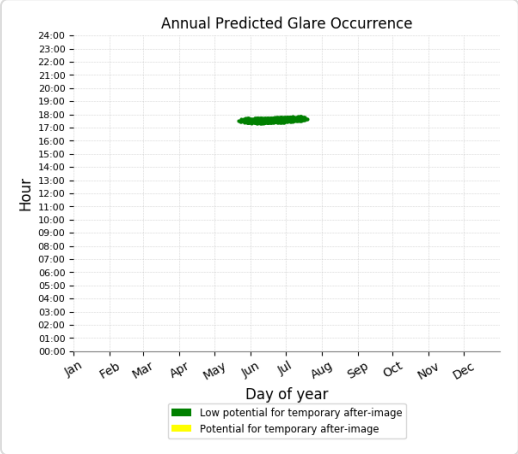


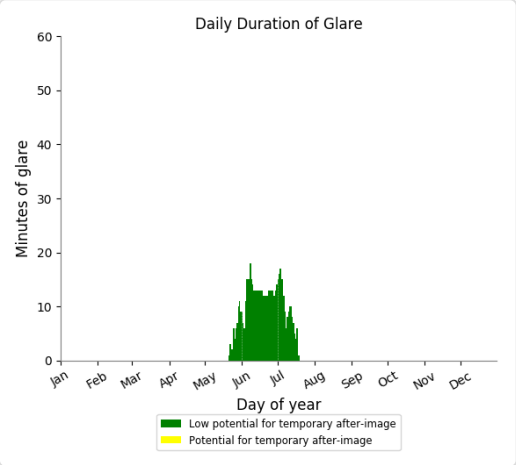


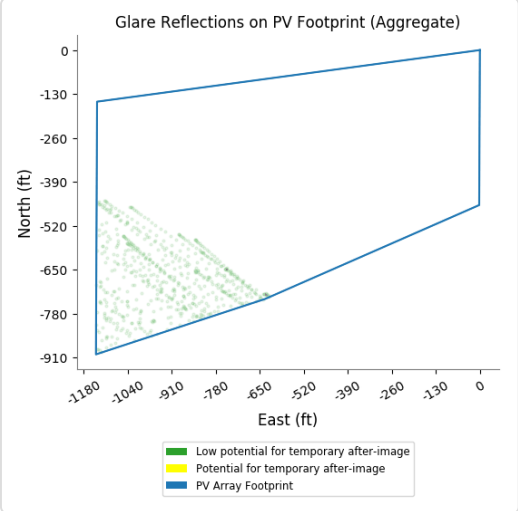
A3 4 - OP Receptor (OP 44)

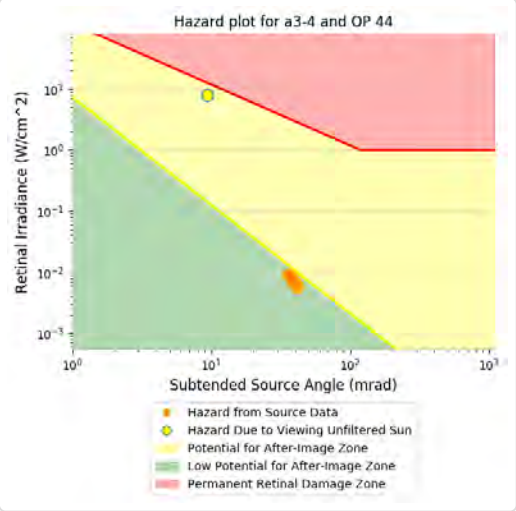
PV array is expected to produce the following glare for receptors at this location:

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









A3 4 - OP Receptor (OP 73)

No glare found

A3 4 - OP Receptor (OP 76)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

GlareGauge Glare Analysis Results

Site Configuration: Array 4-1 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 11:49 a.m.**
Updated **May 13, 2020 12:28 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39163.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A4 1	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A4 1
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.890112	-74.161322	711.28	10.00	721.28
2	42.886731	-74.158086	777.38	10.00	787.38
3	42.886278	-74.161988	741.64	10.00	751.64
4	42.886885	-74.162962	730.01	10.00	740.01
5	42.888771	-74.163918	716.13	10.00	726.13

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 65	42.890889	-74.159770	704.69	8.00	712.69

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A4 1	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A4 1 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 65	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 5-1 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 11:49 a.m.**
Updated **May 13, 2020 12:30 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39164.5043

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
A5 1	25.0	180.0	0	12,335	-

Component Data

PV Array(s)

Name: A5 1
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.889843	-74.146265	787.34	10.00	797.34
2	42.889838	-74.144498	796.06	10.00	806.06
3	42.889624	-74.143544	803.44	10.00	813.44
4	42.887007	-74.140208	920.86	10.00	930.86
5	42.886594	-74.140210	926.95	10.00	936.95
6	42.885374	-74.142628	912.08	10.00	922.08
7	42.885376	-74.143120	909.18	10.00	919.18
8	42.885760	-74.143476	902.24	10.00	912.24
9	42.885119	-74.145577	896.33	10.00	906.33
10	42.885465	-74.147049	887.69	10.00	897.69
11	42.886771	-74.148300	870.20	10.00	880.20
12	42.887599	-74.148296	857.62	10.00	867.62
13	42.889178	-74.147575	818.86	10.00	828.86

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 24	42.889587	-74.149577	803.12	16.00	819.12
OP 28	42.889113	-74.150335	815.53	16.00	831.53
OP 29	42.888530	-74.149500	829.82	16.00	845.82
OP 72	42.889264	-74.149082	812.51	8.00	820.51

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A5 1	25.0	180.0	0	12,335	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

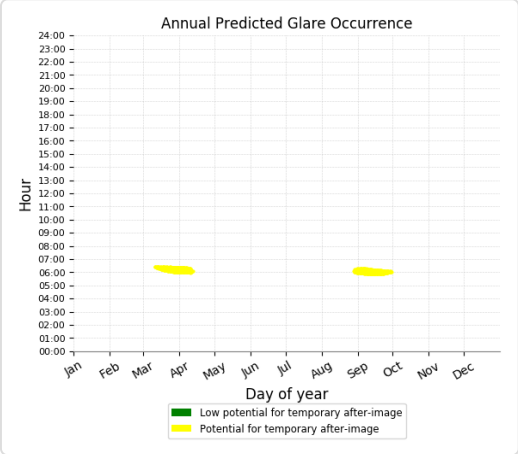
A5 1 potential temporary after-image

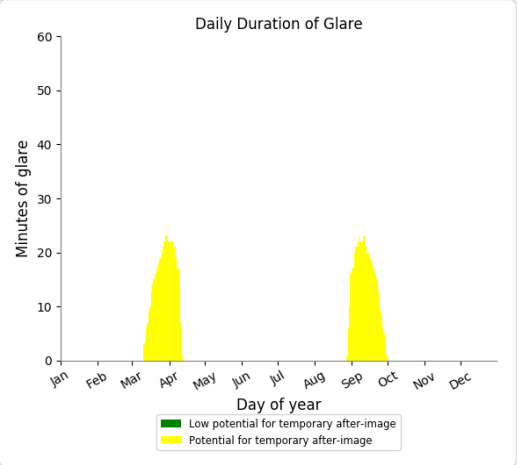
Component	Green glare (min)	Yellow glare (min)
OP: OP 24	0	1045
OP: OP 28	0	2179
OP: OP 29	0	6593
OP: OP 72	0	2518

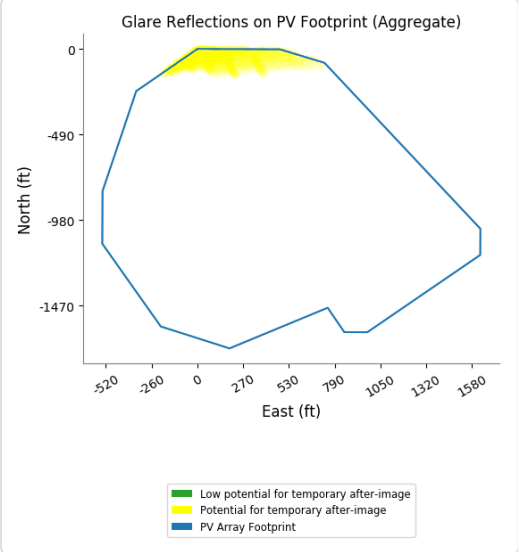
A5 1 - OP Receptor (OP 24)

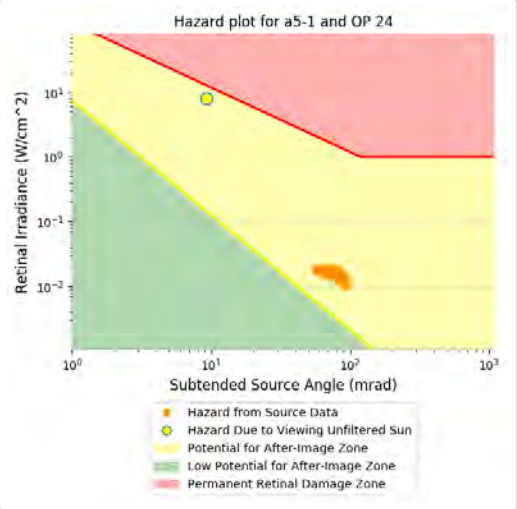
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,045 minutes of "yellow" glare with potential to cause temporary after-image.





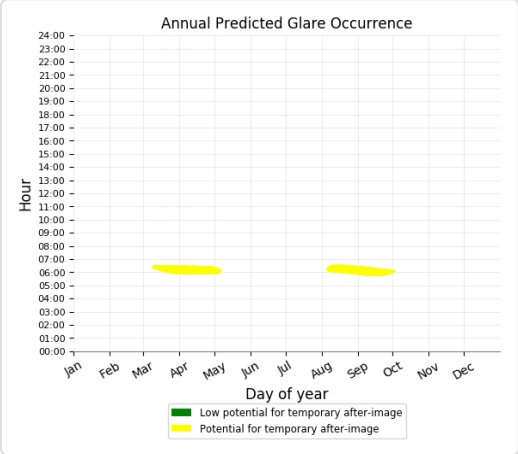


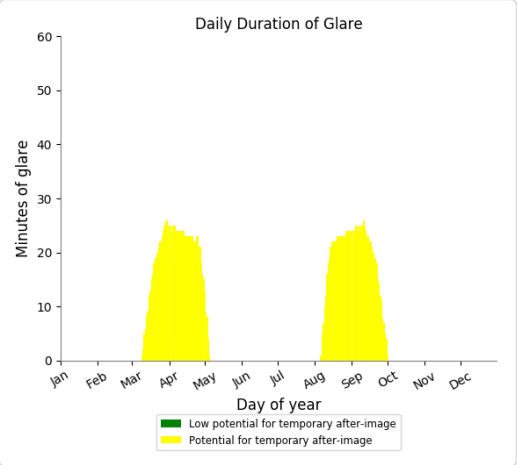


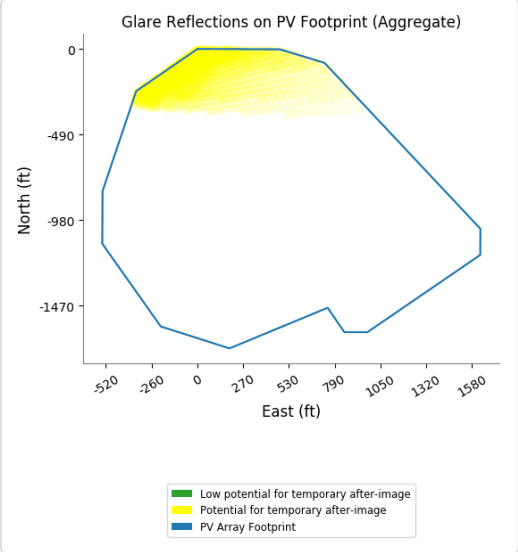
A5 1 - OP Receptor (OP 28)

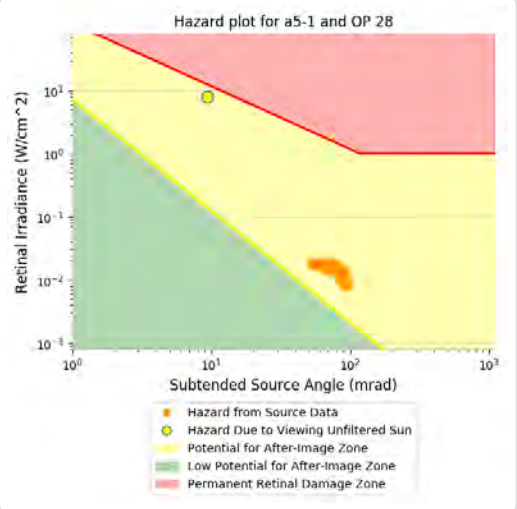
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,179 minutes of "yellow" glare with potential to cause temporary after-image.





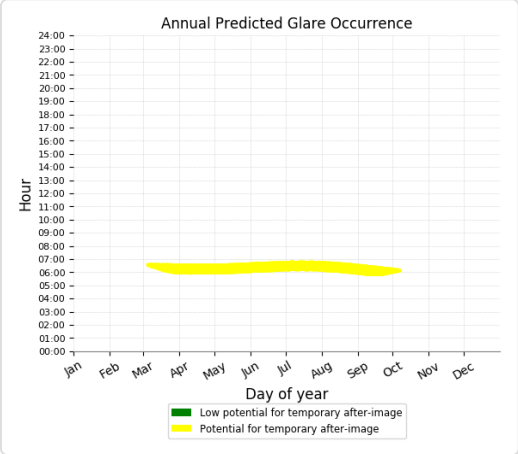


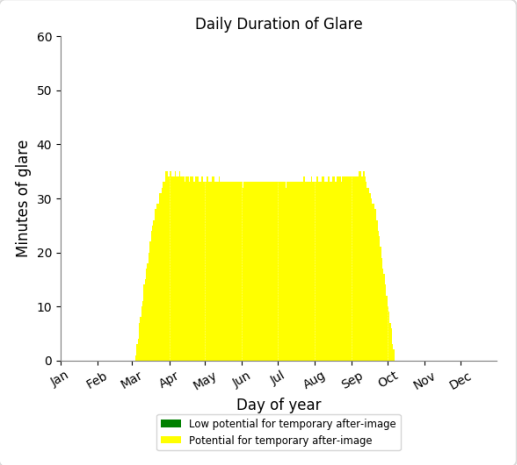


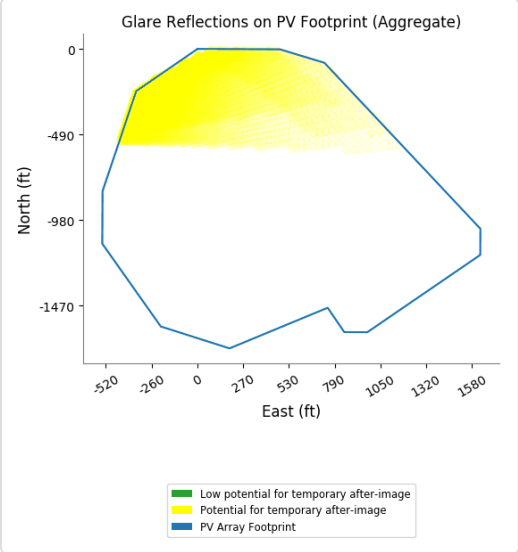
A5 1 - OP Receptor (OP 29)

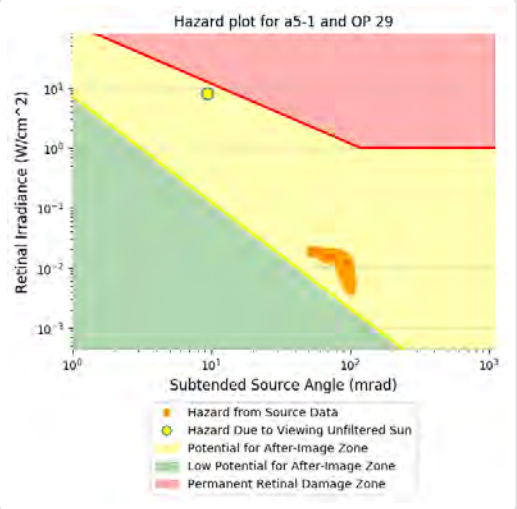
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 6,593 minutes of "yellow" glare with potential to cause temporary after-image.





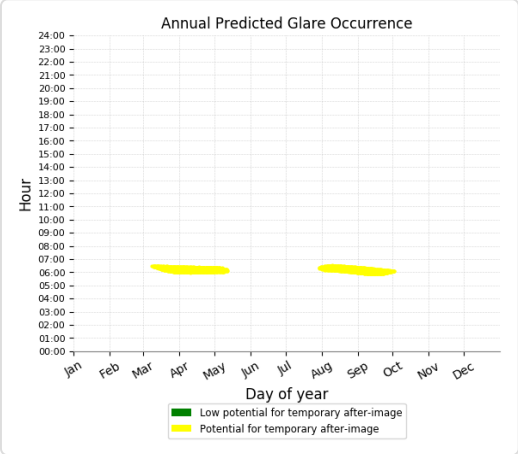


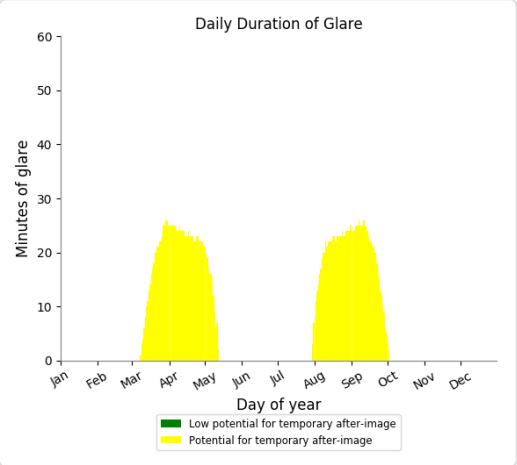


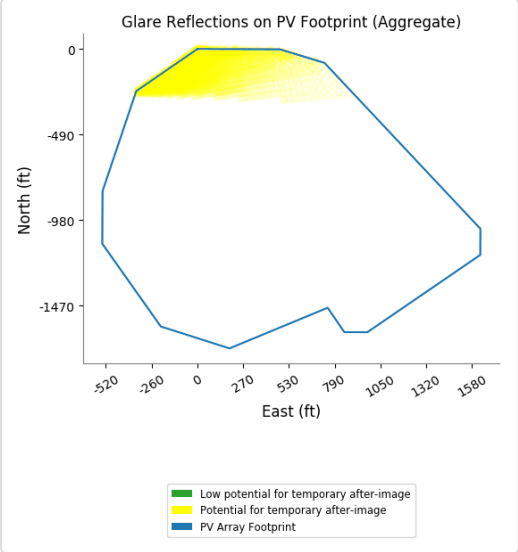
A5 1 - OP Receptor (OP 72)

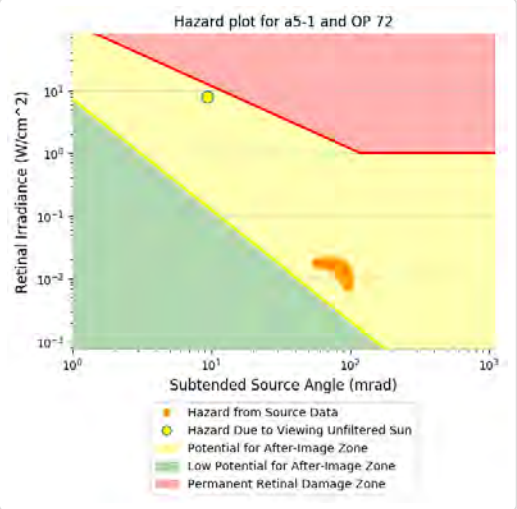
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,518 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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 6-1 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 11:57 a.m.**
Updated **May 13, 2020 1:08 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39166.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A6 1	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A6 1
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.892883	-74.131755	687.39	10.00	697.39
2	42.892878	-74.130269	681.83	10.00	691.83
3	42.891285	-74.129407	728.63	10.00	738.63
4	42.890877	-74.129427	746.77	10.00	756.77
5	42.891124	-74.132423	756.72	10.00	766.72
6	42.889810	-74.134827	818.28	10.00	828.28
7	42.889812	-74.135389	822.49	10.00	832.49
8	42.890591	-74.136290	799.34	10.00	809.34

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 18	42.897823	-74.133705	597.16	16.00	613.16
OP 74	42.895349	-74.135464	631.08	8.00	639.08
OP 75	42.896604	-74.133350	593.73	8.00	601.73

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A6 1	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A6 1 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 10	0	0
OP: OP 11	0	0
OP: OP 18	0	0
OP: OP 74	0	0
OP: OP 75	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-1 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:19 p.m.**
Updated **May 13, 2020 1:14 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39172.5043

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
A7 1	25.0	180.0	4	1,762	-

Component Data

PV Array(s)

Name: A7 1
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.895783	-74.125547	599.46	10.00	609.46
2	42.895058	-74.122344	607.42	10.00	617.42
3	42.893963	-74.124601	647.04	10.00	657.04
4	42.893971	-74.127063	664.87	10.00	674.87
5	42.895051	-74.127057	620.77	10.00	630.77

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 16	42.900310	-74.132858	535.30	16.00	551.30
OP 18	42.897823	-74.133705	597.16	16.00	613.16
OP 33	42.895612	-74.128218	603.88	16.00	619.88
OP 34	42.896544	-74.126614	578.00	16.00	594.00
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 51	42.899927	-74.128083	496.16	16.00	512.16
OP 52	42.900524	-74.127042	491.12	16.00	507.12
OP 63	42.902367	-74.125263	458.61	8.00	466.62
OP 67	42.895682	-74.121979	595.90	8.00	603.90
OP 69	42.896354	-74.124360	587.02	8.00	595.02
OP 70	42.897171	-74.128255	549.05	8.00	557.05
OP 75	42.896604	-74.133350	593.73	8.00	601.73

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 1	25.0	180.0	4	1,762	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A7 1 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 16	0	0
OP: OP 18	0	0
OP: OP 33	0	52
OP: OP 34	0	0
OP: OP 40	2	639
OP: OP 43	2	1052
OP: OP 44	0	0
OP: OP 51	0	0
OP: OP 52	0	0
OP: OP 63	0	0
OP: OP 67	0	19
OP: OP 69	0	0
OP: OP 70	0	0
OP: OP 75	0	0

A7 1 - OP Receptor (OP 16)

No glare found

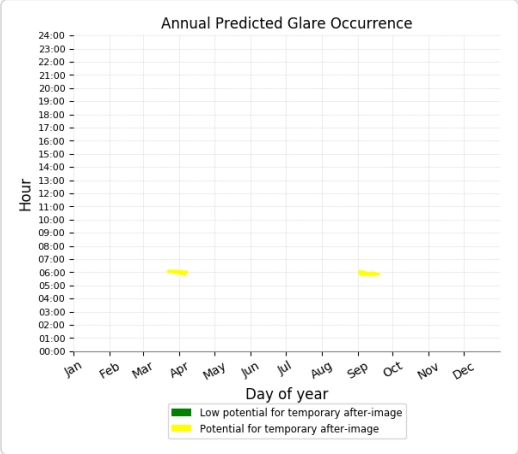
A7 1 - OP Receptor (OP 18)

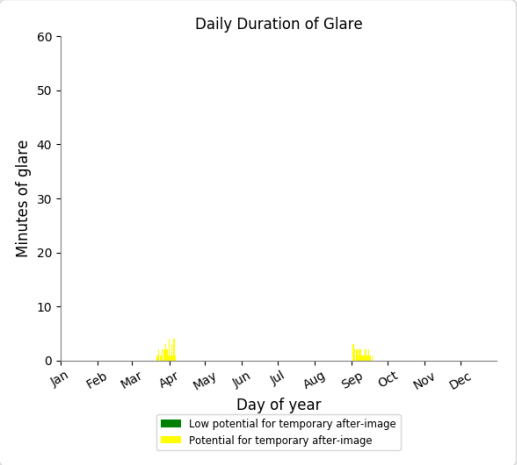
No glare found

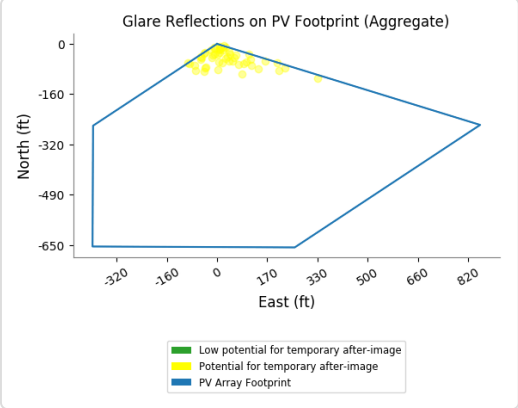
A7 1 - OP Receptor (OP 33)

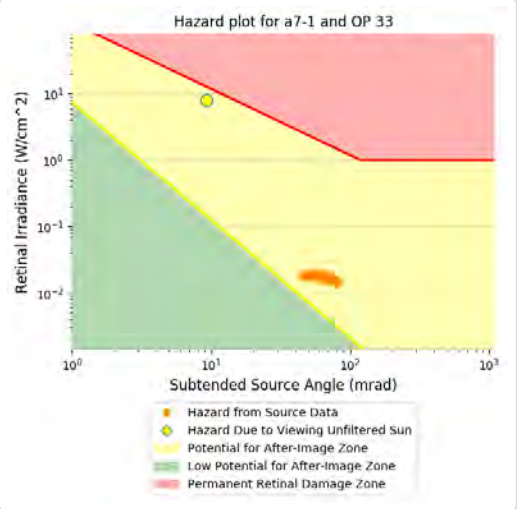
PV array is expected to produce the following glare for receptors at this location:

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









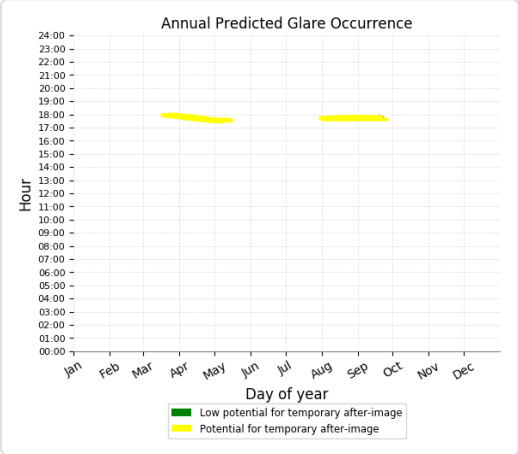
A7 1 - OP Receptor (OP 34)

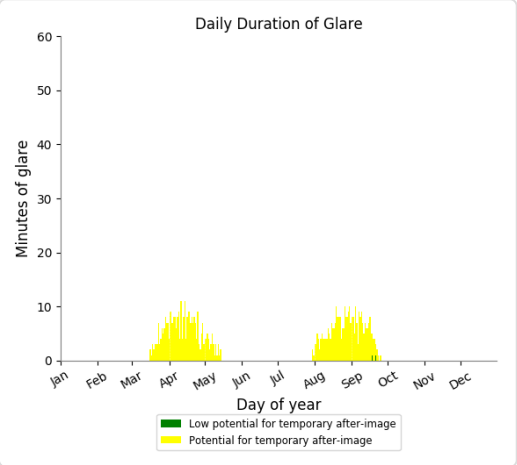
No glare found

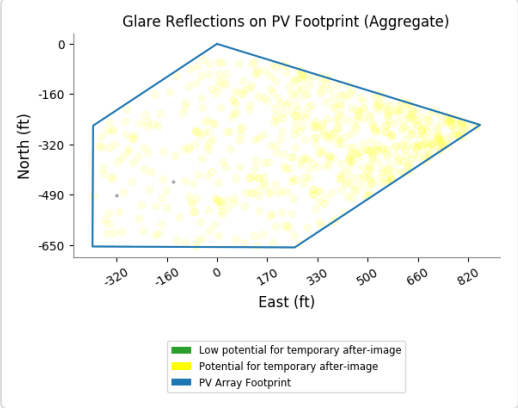
A7 1 - OP Receptor (OP 40)

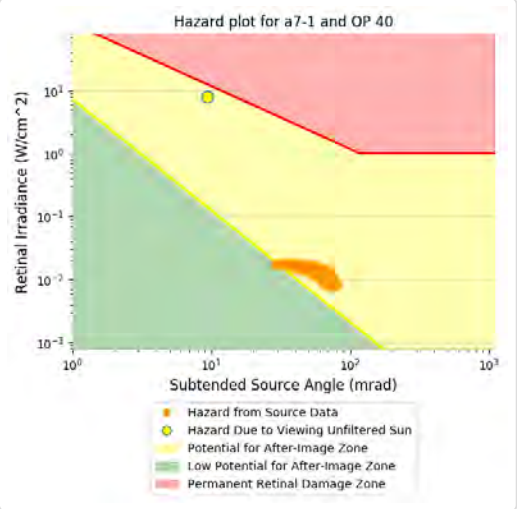
PV array is expected to produce the following glare for receptors at this location:

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





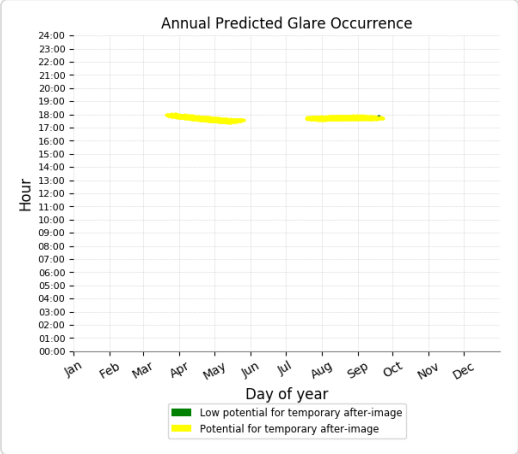


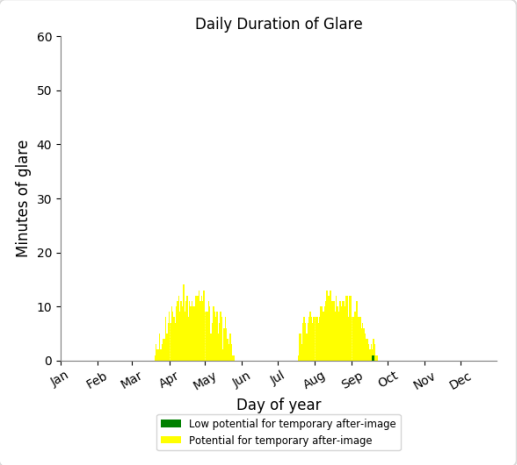


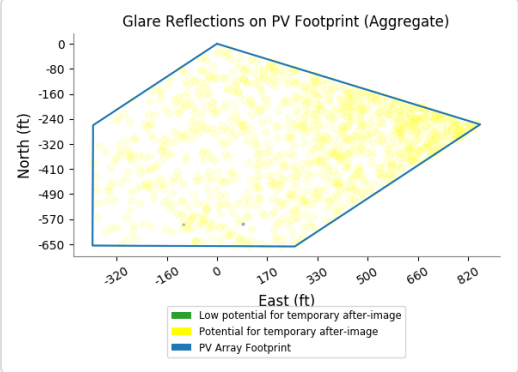
A7 1 - OP Receptor (OP 43)

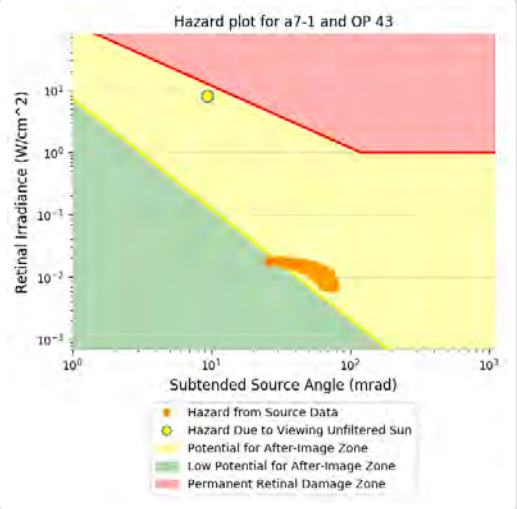
PV array is expected to produce the following glare for receptors at this location:

- 2 minutes of "green" glare with low potential to cause temporary after-image.
- 1,052 minutes of "yellow" glare with potential to cause temporary after-image.









A7 1 - OP Receptor (OP 44)

No glare found

A7 1 - OP Receptor (OP 51)

No glare found

A7 1 - OP Receptor (OP 52)

No glare found

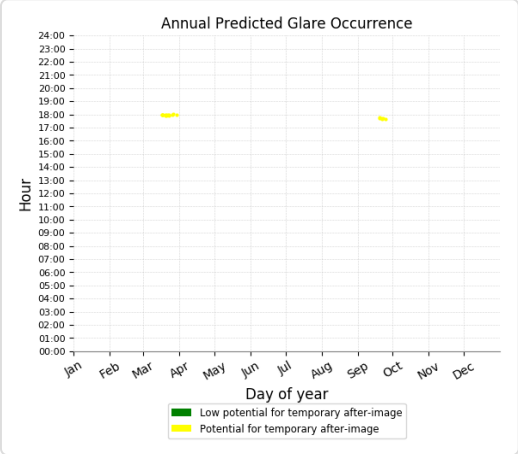
A7 1 - OP Receptor (OP 63)

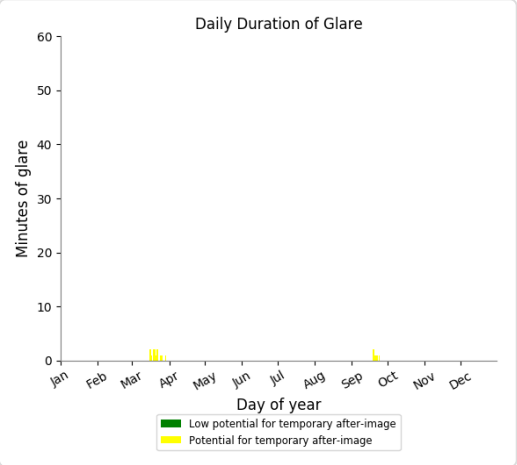
No glare found

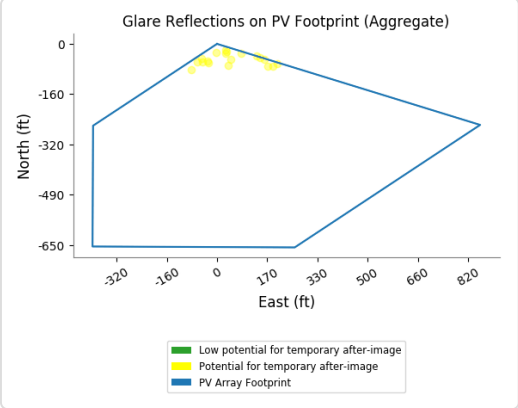
A7 1 - OP Receptor (OP 67)

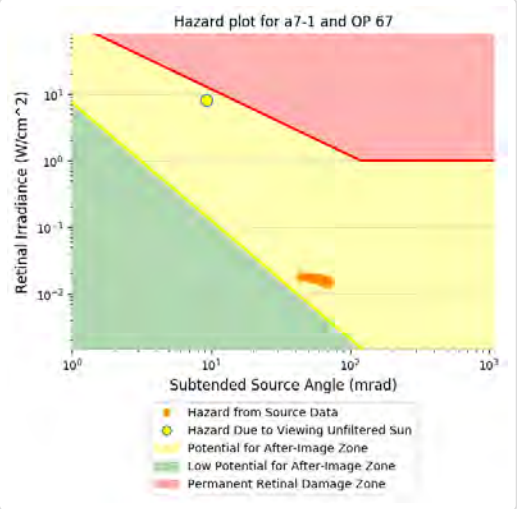
PV array is expected to produce the following glare for receptors at this location:

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









A7 1 - OP Receptor (OP 69)

No glare found

A7 1 - OP Receptor (OP 70)

No glare found

A7 1 - OP Receptor (OP 75)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-2 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:19 p.m.**
Updated **May 13, 2020 1:14 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39173.5043

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

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A7 2	25.0	180.0	10	0	-

Component Data

PV Array(s)

Name: A7 2
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.893970	-74.126746	663.88	10.00	673.89
2	42.892608	-74.126755	696.03	10.00	706.03
3	42.892614	-74.128851	690.27	10.00	700.27
4	42.893423	-74.128017	675.17	10.00	685.17
5	42.893971	-74.127063	664.87	10.00	674.87

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 52	42.900524	-74.127042	491.12	16.00	507.12
OP 67	42.895682	-74.121979	595.90	8.00	603.90
OP 68	42.894759	-74.118727	613.34	8.00	621.34
OP 69	42.896354	-74.124360	587.02	8.00	595.02

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 2	25.0	180.0	10	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

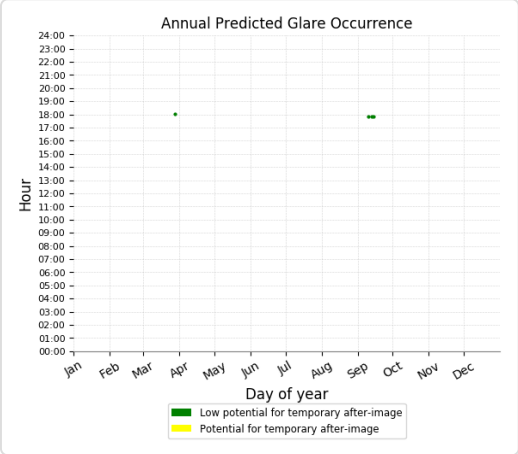
A7 2 low potential for temporary after-image

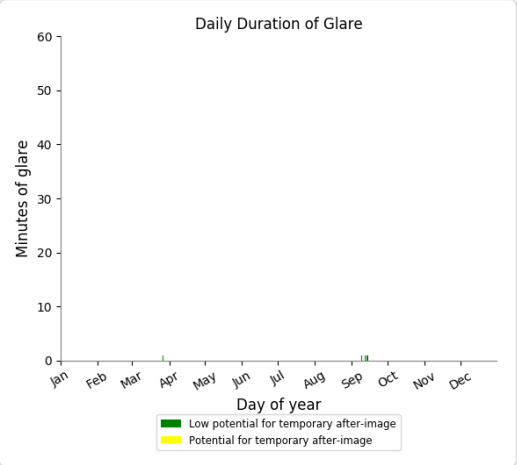
Component	Green glare (min)	Yellow glare (min)
OP: OP 43	4	0
OP: OP 44	6	0
OP: OP 52	0	0
OP: OP 67	0	0
OP: OP 68	0	0
OP: OP 69	0	0

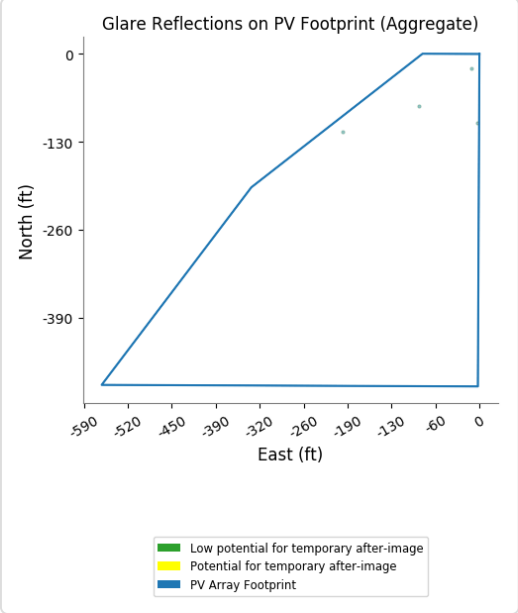
A7 2 - OP Receptor (OP 43)

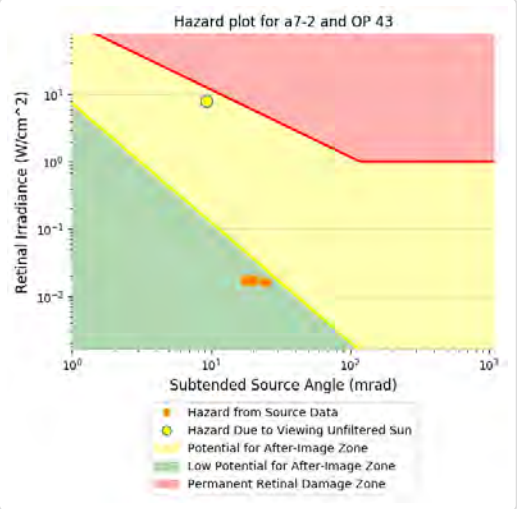
PV array is expected to produce the following glare for receptors at this location:

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





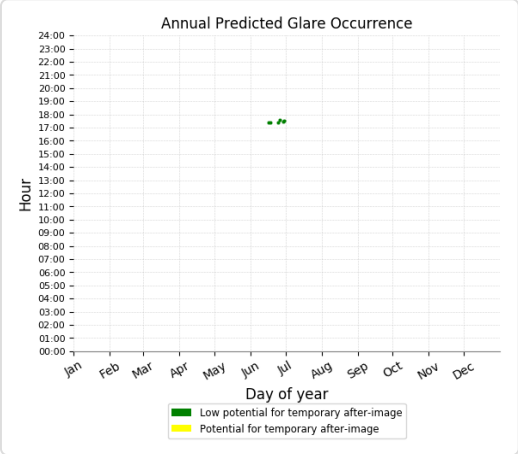


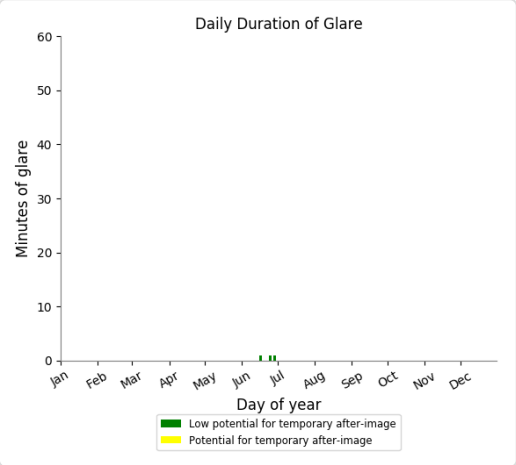


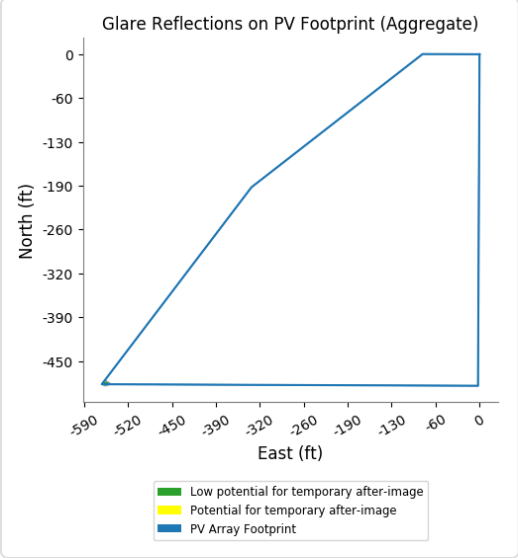
A7 2 - OP Receptor (OP 44)

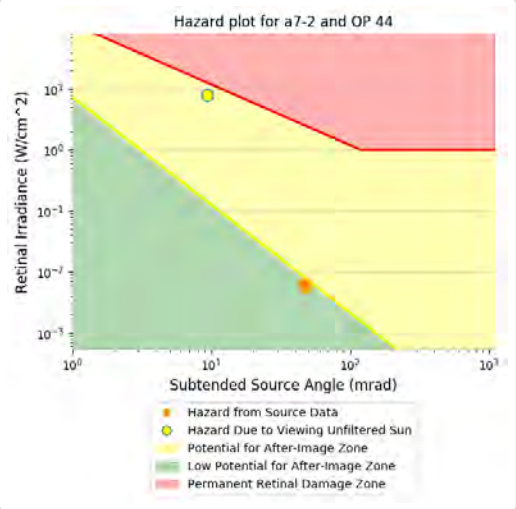
PV array is expected to produce the following glare for receptors at this location:

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









A7 2 - OP Receptor (OP 52)

No glare found

A7 2 - OP Receptor (OP 67)

No glare found

A7 2 - OP Receptor (OP 68)

No glare found

A7 2 - OP Receptor (OP 69)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-3 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:21 p.m.**
Updated **May 13, 2020 1:16 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39174.5043

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
A7 3	25.0	180.0	190	14	-

Component Data

PV Array(s)

Name: A7 3
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.893966	-74.125639	657.50	10.00	667.50
2	42.892096	-74.125650	719.43	10.00	729.44
3	42.892100	-74.126758	727.32	10.00	737.32
4	42.893970	-74.126746	663.88	10.00	673.89

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 34	42.896544	-74.126614	578.00	16.00	594.00
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 42	42.894598	-74.117405	624.89	16.00	640.89
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 52	42.900524	-74.127042	491.12	16.00	507.12
OP 63	42.902367	-74.125263	458.61	8.00	466.62
OP 67	42.895682	-74.121979	595.90	8.00	603.90
OP 69	42.896354	-74.124360	587.02	8.00	595.02

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 3	25.0	180.0	190	14	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A7 3 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 34	0	0
OP: OP 40	38	0
OP: OP 42	0	0
OP: OP 43	152	14
OP: OP 44	0	0
OP: OP 52	0	0
OP: OP 63	0	0
OP: OP 67	0	0
OP: OP 69	0	0

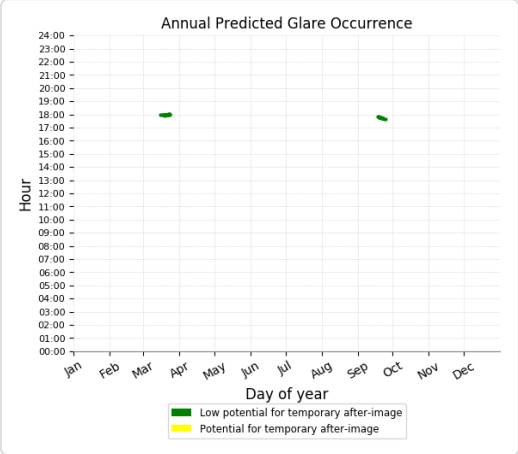
A7 3 - OP Receptor (OP 34)

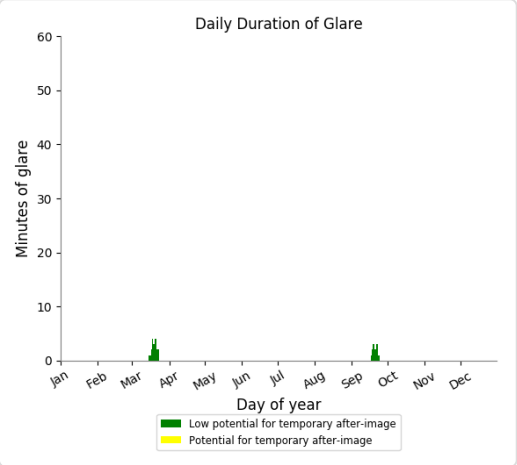
No glare found

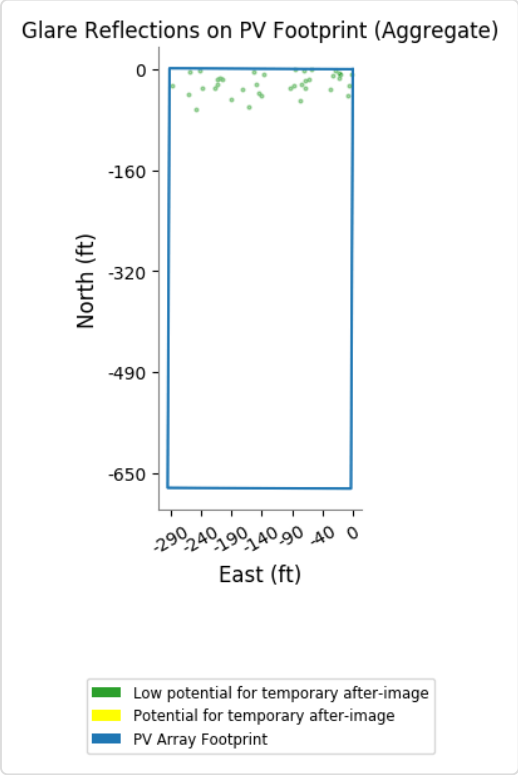
A7 3 - OP Receptor (OP 40)

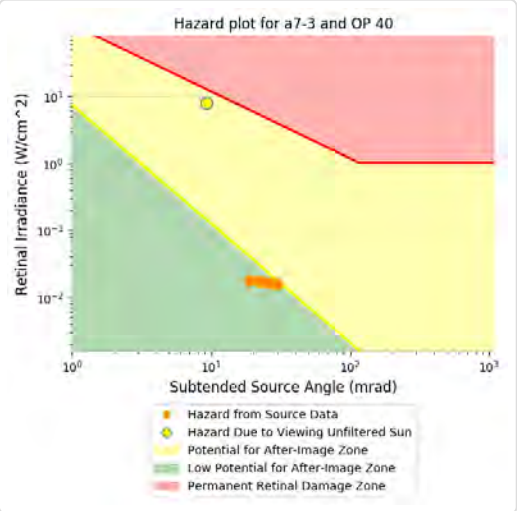
PV array is expected to produce the following glare for receptors at this location:

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









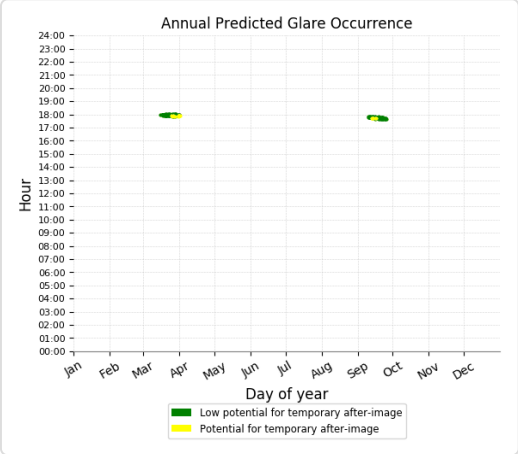
A7 3 - OP Receptor (OP 42)

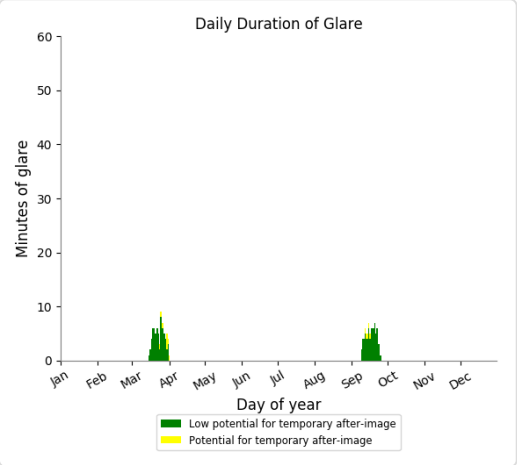
No glare found

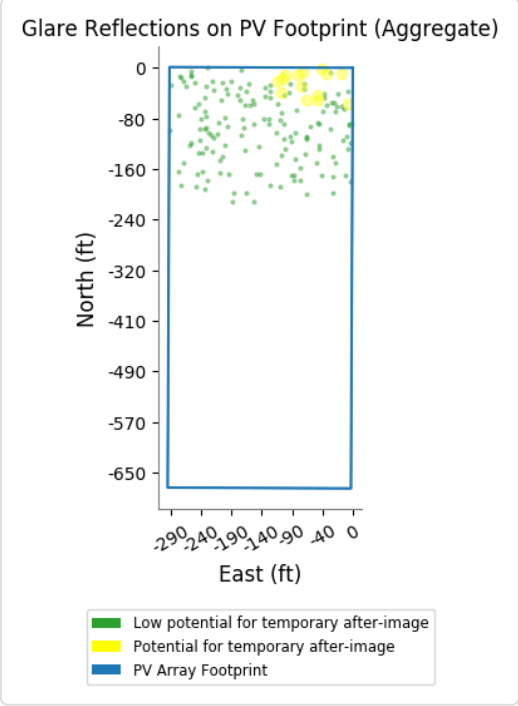
A7 3 - OP Receptor (OP 43)

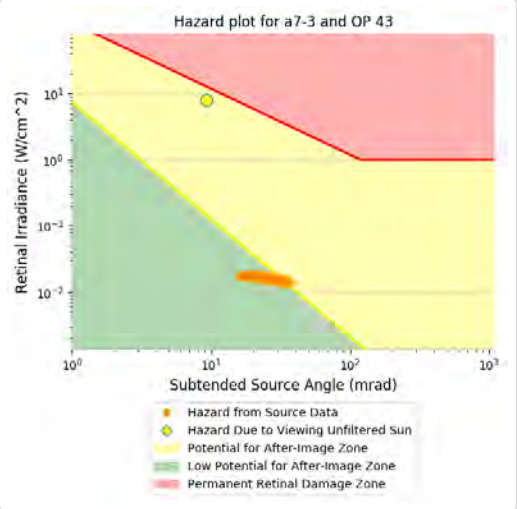
PV array is expected to produce the following glare for receptors at this location:

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









A7 3 - OP Receptor (OP 44)

No glare found

A7 3 - OP Receptor (OP 52)

No glare found

A7 3 - OP Receptor (OP 63)

No glare found

A7 3 - OP Receptor (OP 67)

No glare found

A7 3 - OP Receptor (OP 69)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-4 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:26 p.m.**
Updated **May 13, 2020 1:19 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39175.5043

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
A7 4	25.0	180.0	23	34	-

Component Data

PV Array(s)

Name: A7 4
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.893963	-74.124601	647.04	10.00	657.04
2	42.893526	-74.122631	638.47	10.00	648.47
3	42.892982	-74.122634	651.26	10.00	661.26
4	42.892755	-74.124220	673.03	10.00	683.03
5	42.892759	-74.125646	687.51	10.00	697.51
6	42.893966	-74.125639	657.50	10.00	667.50

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 16	42.900310	-74.132858	535.30	16.00	551.30
OP 34	42.896544	-74.126614	578.00	16.00	594.00
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 52	42.900524	-74.127042	491.12	16.00	507.12
OP 68	42.894759	-74.118727	613.34	8.00	621.34
OP 69	42.896354	-74.124360	587.02	8.00	595.02

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 4	25.0	180.0	23	34	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A7 4 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 16	0	0
OP: OP 34	0	0
OP: OP 40	23	34
OP: OP 44	0	0
OP: OP 52	0	0
OP: OP 68	0	0
OP: OP 69	0	0

A7 4 - OP Receptor (OP 16)

No glare found

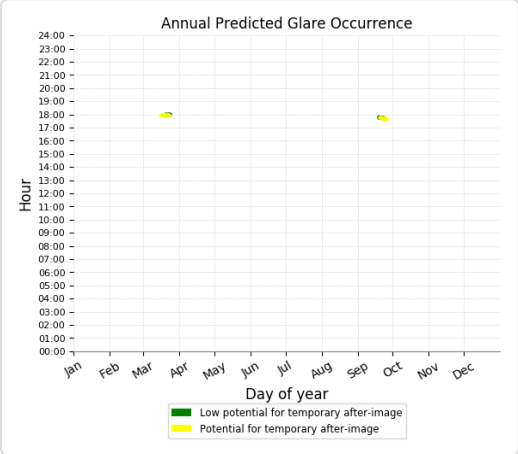
A7 4 - OP Receptor (OP 34)

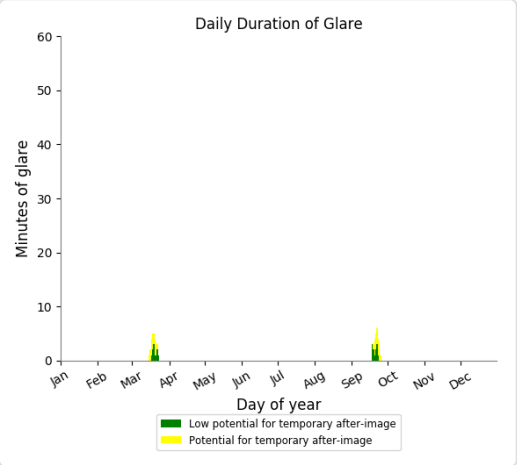
No glare found

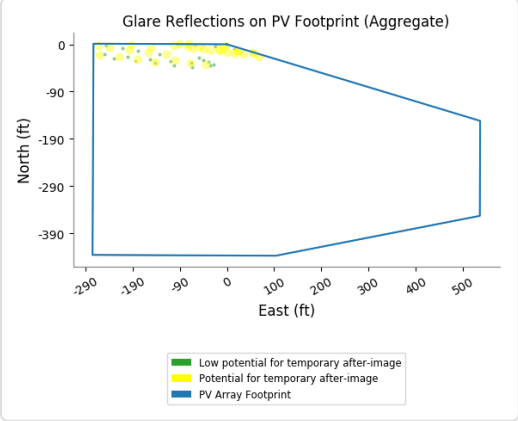
A7 4 - OP Receptor (OP 40)

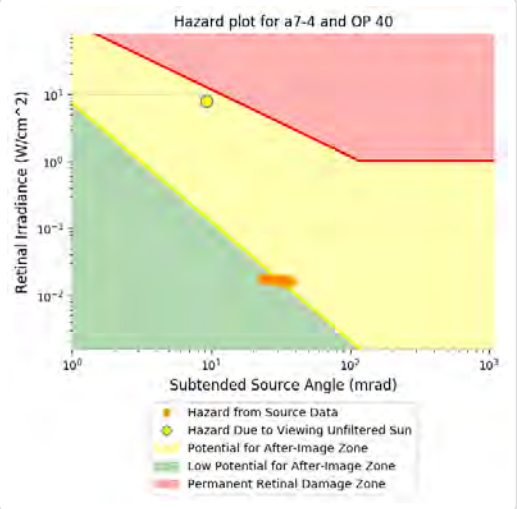
PV array is expected to produce the following glare for receptors at this location:

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









A7 4 - OP Receptor (OP 44)

No glare found

A7 4 - OP Receptor (OP 52)

No glare found

A7 4 - OP Receptor (OP 68)

No glare found

A7 4 - OP Receptor (OP 69)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-5 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:26 p.m.**
Updated **May 13, 2020 1:28 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39176.5043

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
A7 5	25.0	180.0	0	657	-

Component Data

PV Array(s)

Name: A7 5
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.892096	-74.125650	719.43	10.00	729.44
2	42.891440	-74.125654	749.63	10.00	759.63
3	42.890977	-74.126607	772.54	10.00	782.54
4	42.890983	-74.128349	746.13	10.00	756.13
5	42.891606	-74.128979	725.33	10.00	735.33
6	42.892107	-74.128976	711.99	10.00	721.99

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 9	42.895449	-74.137219	645.32	16.00	661.32
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 34	42.896544	-74.126614	578.00	16.00	594.00
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 42	42.894598	-74.117405	624.89	16.00	640.89
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 52	42.900524	-74.127042	491.12	16.00	507.12
OP 63	42.902367	-74.125263	458.61	8.00	466.62
OP 67	42.895682	-74.121979	595.90	8.00	603.90
OP 68	42.894759	-74.118727	613.34	8.00	621.34
OP 69	42.896354	-74.124360	587.02	8.00	595.02
OP 70	42.897171	-74.128255	549.05	8.00	557.05
OP 74	42.895349	-74.135464	631.08	8.00	639.08

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 5	25.0	180.0	0	657	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A7 5 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 9	0	0
OP: OP 10	0	0
OP: OP 34	0	0
OP: OP 40	0	0
OP: OP 42	0	0
OP: OP 43	0	0
OP: OP 44	0	657
OP: OP 52	0	0
OP: OP 63	0	0
OP: OP 67	0	0
OP: OP 68	0	0
OP: OP 69	0	0
OP: OP 70	0	0
OP: OP 74	0	0

A7 5 - OP Receptor (OP 9)

No glare found

A7 5 - OP Receptor (OP 10)

No glare found

A7 5 - OP Receptor (OP 34)

No glare found

A7 5 - OP Receptor (OP 40)

No glare found

A7 5 - OP Receptor (OP 42)

No glare found

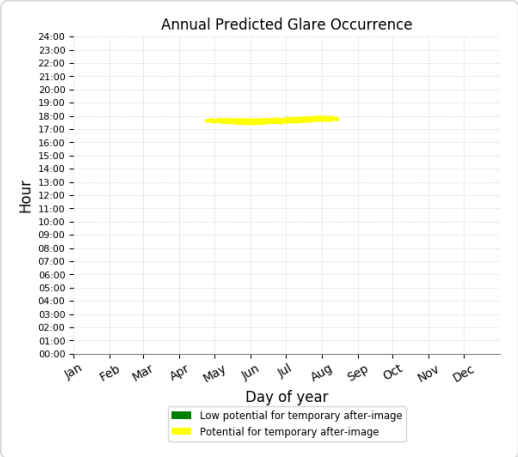
A7 5 - OP Receptor (OP 43)

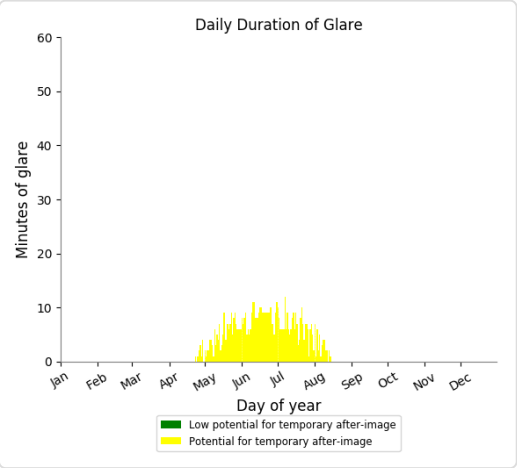
No glare found

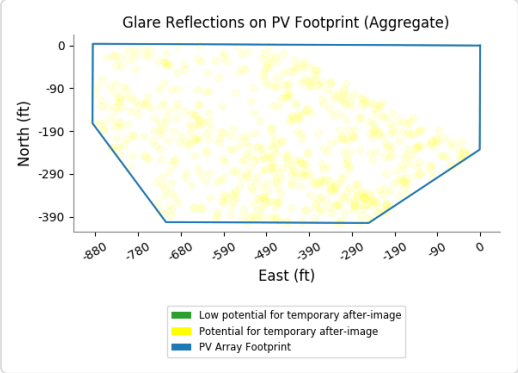
A7 5 - OP Receptor (OP 44)

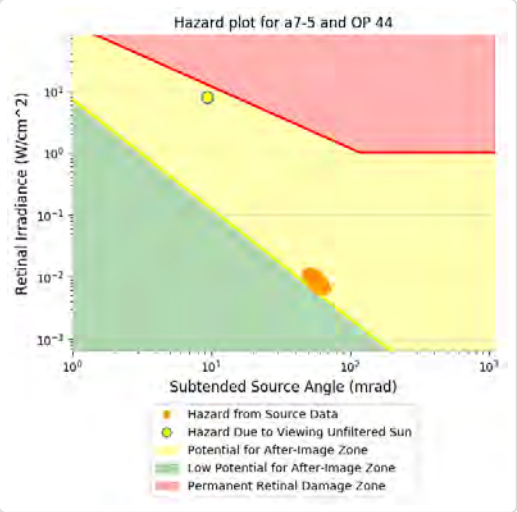
PV array is expected to produce the following glare for receptors at this location:

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









A7 5 - OP Receptor (OP 52)

No glare found

A7 5 - OP Receptor (OP 63)

No glare found

A7 5 - OP Receptor (OP 67)

No glare found

A7 5 - OP Receptor (OP 68)

No glare found

A7 5 - OP Receptor (OP 69)

No glare found

A7 5 - OP Receptor (OP 70)

No glare found

A7 5 - OP Receptor (OP 74)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-6 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:26 p.m.**
Updated **May 13, 2020 1:29 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39177.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A7 6	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A7 6
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.890978	-74.126925	769.88	10.00	779.88
2	42.890745	-74.126926	779.37	10.00	789.37
3	42.889349	-74.127270	816.01	10.00	826.01
4	42.889351	-74.127871	808.60	10.00	818.60
5	42.890672	-74.128351	752.13	10.00	762.13
6	42.890983	-74.128349	746.13	10.00	756.13

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 9	42.895449	-74.137219	645.32	16.00	661.32
OP 10	42.896538	-74.135272	617.61	16.00	633.61
OP 11	42.896899	-74.134649	608.31	16.00	624.31
OP 18	42.897823	-74.133705	597.16	16.00	613.16
OP 34	42.896544	-74.126614	578.00	16.00	594.00
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 42	42.894598	-74.117405	624.89	16.00	640.89
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 52	42.900524	-74.127042	491.12	16.00	507.12
OP 63	42.902367	-74.125263	458.61	8.00	466.62
OP 67	42.895682	-74.121979	595.90	8.00	603.90
OP 68	42.894759	-74.118727	613.34	8.00	621.34
OP 69	42.896354	-74.124360	587.02	8.00	595.02
OP 74	42.895349	-74.135464	631.08	8.00	639.08

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 6	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A7 6 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 9	0	0
OP: OP 10	0	0
OP: OP 11	0	0
OP: OP 18	0	0
OP: OP 34	0	0
OP: OP 40	0	0
OP: OP 42	0	0
OP: OP 43	0	0
OP: OP 52	0	0
OP: OP 63	0	0
OP: OP 67	0	0
OP: OP 68	0	0
OP: OP 69	0	0
OP: OP 74	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-7 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:26 p.m.**
Updated **May 13, 2020 1:33 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39178.5043

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
A7 7	25.0	180.0	0	58	-

Component Data

PV Array(s)

Name: A7 7
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.892400	-74.123558	683.87	10.00	693.87
2	42.891776	-74.122798	703.17	10.00	713.17
3	42.891583	-74.122799	712.00	10.00	722.00
4	42.891357	-74.124070	738.51	10.00	748.51
5	42.891362	-74.125655	754.23	10.00	764.23
6	42.892407	-74.125648	705.63	10.00	715.63

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 16	42.900310	-74.132858	535.30	16.00	551.30
OP 34	42.896544	-74.126614	578.00	16.00	594.00
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 42	42.894598	-74.117405	624.89	16.00	640.89
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 52	42.900524	-74.127042	491.12	16.00	507.12
OP 63	42.902367	-74.125263	458.61	8.00	466.62
OP 67	42.895682	-74.121979	595.90	8.00	603.90
OP 68	42.894759	-74.118727	613.34	8.00	621.34
OP 69	42.896354	-74.124360	587.02	8.00	595.02

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 7	25.0	180.0	0	58	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A7 7 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 16	0	0
OP: OP 34	0	0
OP: OP 40	0	0
OP: OP 42	0	0
OP: OP 43	0	0
OP: OP 44	0	58
OP: OP 52	0	0
OP: OP 63	0	0
OP: OP 67	0	0
OP: OP 68	0	0
OP: OP 69	0	0

A7 7 - OP Receptor (OP 16)

No glare found

A7 7 - OP Receptor (OP 34)

No glare found

A7 7 - OP Receptor (OP 40)

No glare found

A7 7 - OP Receptor (OP 42)

No glare found

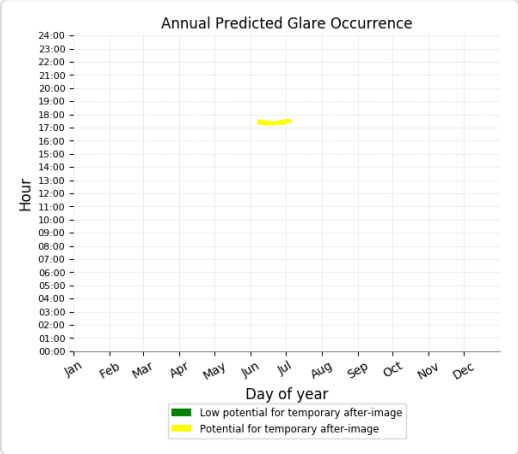
A7 7 - OP Receptor (OP 43)

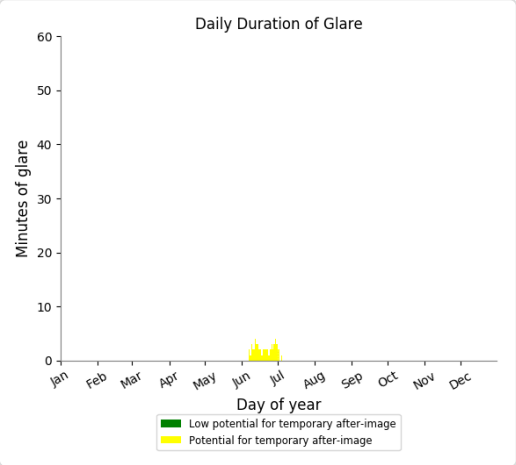
No glare found

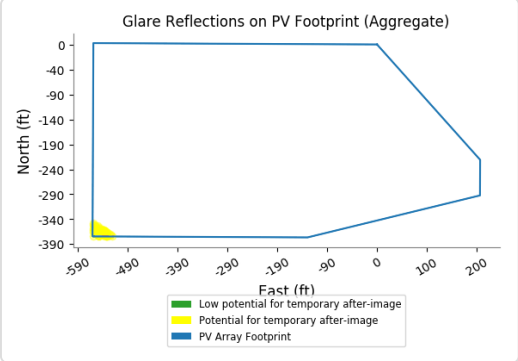
A7 7 - OP Receptor (OP 44)

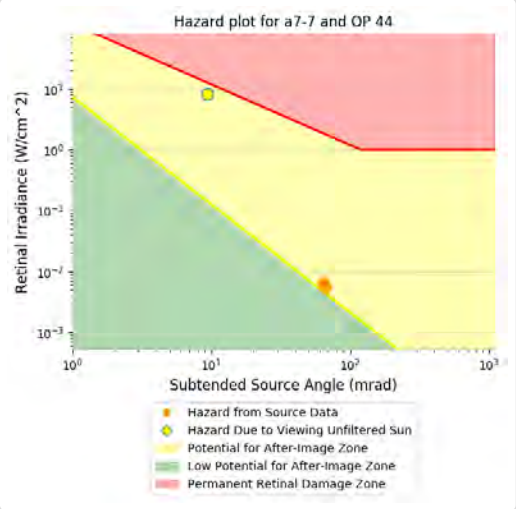
PV array is expected to produce the following glare for receptors at this location:

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









A7 7 - OP Receptor (OP 52)

No glare found

A7 7 - OP Receptor (OP 63)

No glare found

A7 7 - OP Receptor (OP 67)

No glare found

A7 7 - OP Receptor (OP 68)

No glare found

A7 7 - OP Receptor (OP 69)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-8 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:27 p.m.**
Updated **May 13, 2020 1:34 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39179.5043

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
A7 8	25.0	180.0	0	0	-

Component Data

PV Array(s)

Name: A7 8
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.892624	-74.121050	659.82	10.00	669.82
2	42.892621	-74.120101	663.95	10.00	673.95
3	42.891122	-74.120111	724.92	10.00	734.93
4	42.890073	-74.121789	760.73	10.00	770.73
5	42.890576	-74.122805	760.06	10.00	770.06
6	42.891776	-74.122798	703.17	10.00	713.17

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 16	42.900310	-74.132858	535.30	16.00	551.30
OP 34	42.896544	-74.126614	578.00	16.00	594.00
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 41	42.895003	-74.118754	615.39	16.00	631.39
OP 42	42.894598	-74.117405	624.89	16.00	640.89
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 52	42.900524	-74.127042	491.12	16.00	507.12
OP 68	42.894759	-74.118727	613.34	8.00	621.34
OP 69	42.896354	-74.124360	587.02	8.00	595.02

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 8	25.0	180.0	0	0	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

A7 8 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 16	0	0
OP: OP 34	0	0
OP: OP 40	0	0
OP: OP 41	0	0
OP: OP 42	0	0
OP: OP 43	0	0
OP: OP 44	0	0
OP: OP 52	0	0
OP: OP 68	0	0
OP: OP 69	0	0

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

ForgeSolar
PV planning & glare analysis

GlareGauge Glare Analysis Results

Site Configuration: Array 7-9 Fixed May20

Project site configuration details and results.

Created **May 12, 2020 1:27 p.m.**
Updated **May 13, 2020 1:42 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC-5**
Site Configuration ID: 39180.5043

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
A7 9	25.0	180.0	0	1,982	-

Component Data

PV Array(s)

Name: A7 9
Axis tracking: Fixed (no rotation)
Tilt: 25.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	42.894093	-74.119143	622.23	10.00	632.23
2	42.893470	-74.118513	644.16	10.00	654.16
3	42.892115	-74.118522	679.79	10.00	689.79
4	42.891122	-74.120111	724.92	10.00	734.93
5	42.894096	-74.120092	620.14	10.00	630.14

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 40	42.894156	-74.117976	629.29	16.00	645.29
OP 41	42.895003	-74.118754	615.39	16.00	631.39
OP 42	42.894598	-74.117405	624.89	16.00	640.89
OP 43	42.893775	-74.117145	644.10	16.00	660.10
OP 44	42.889212	-74.119802	856.47	16.00	872.47
OP 68	42.894759	-74.118727	613.34	8.00	621.34
OP 69	42.896354	-74.124360	587.02	8.00	595.02

PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
A7 9	25.0	180.0	0	1,982	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

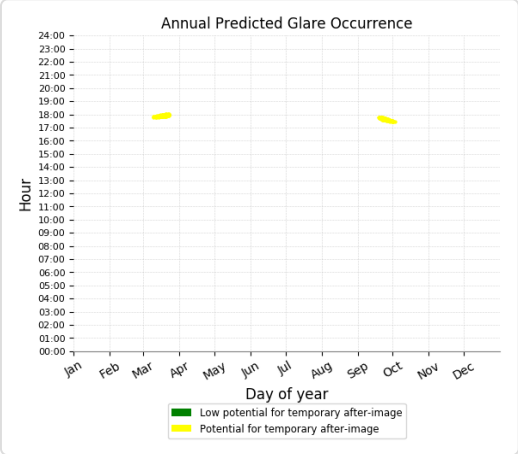
A7 9 potential temporary after-image

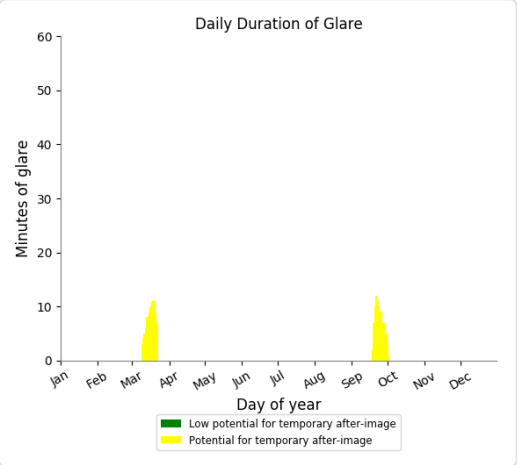
Component	Green glare (min)	Yellow glare (min)
OP: OP 40	0	223
OP: OP 41	0	0
OP: OP 42	0	0
OP: OP 43	0	1759
OP: OP 44	0	0
OP: OP 68	0	0
OP: OP 69	0	0

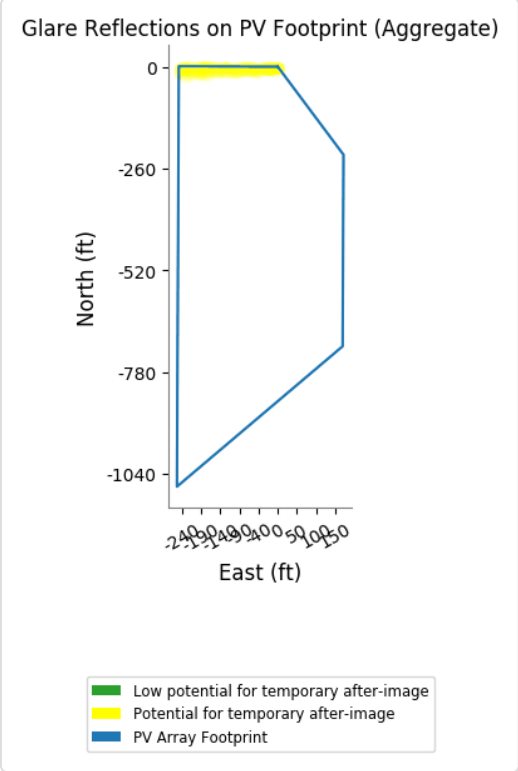
A7 9 - OP Receptor (OP 40)

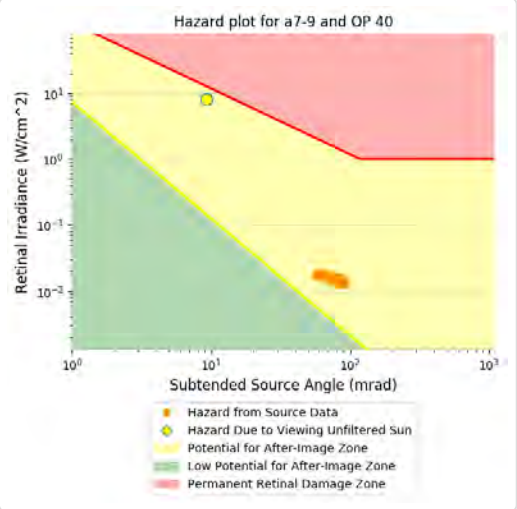
PV array is expected to produce the following glare for receptors at this location:

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









A7 9 - OP Receptor (OP 41)

No glare found

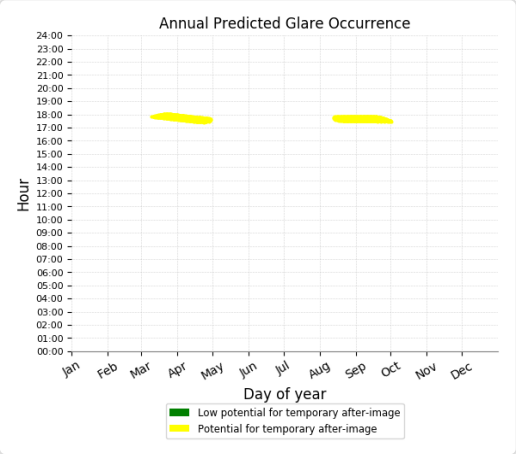
A7 9 - OP Receptor (OP 42)

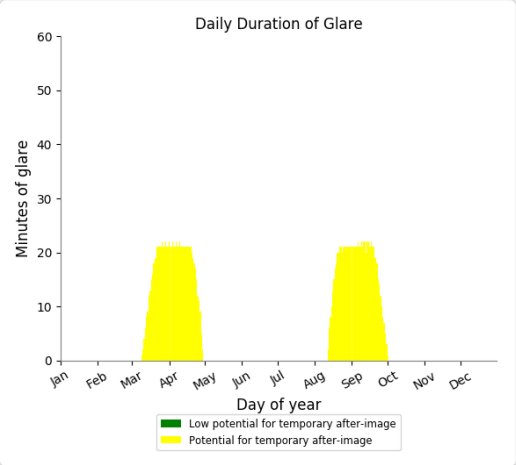
No glare found

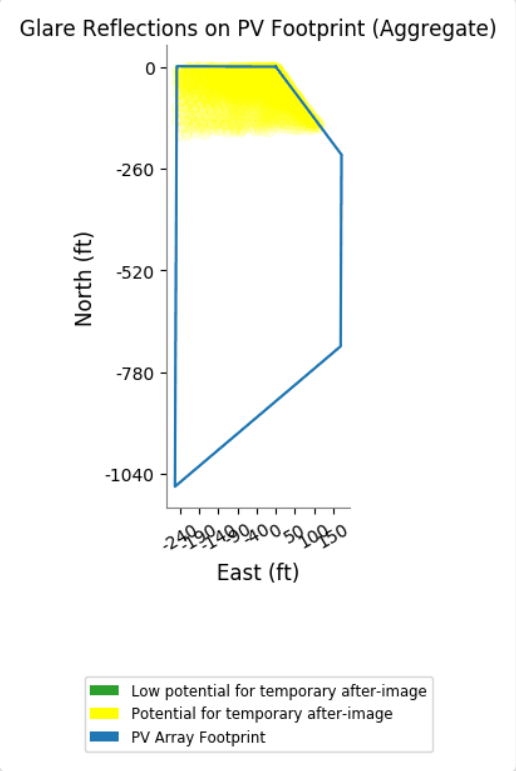
A7 9 - OP Receptor (OP 43)

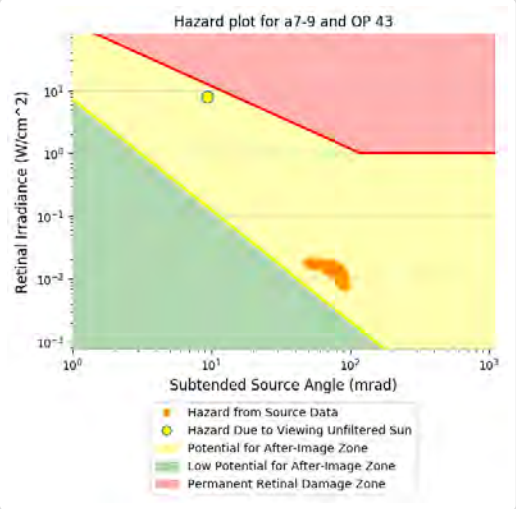
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,759 minutes of "yellow" glare with potential to cause temporary after-image.









A7 9 - OP Receptor (OP 44)

No glare found

A7 9 - OP Receptor (OP 68)

No glare found

A7 9 - OP Receptor (OP 69)

No glare found

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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for 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.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.