ATTACHMENT H: SOLAR GLARE ANALYSIS

Wautoma Solar Energy Project
Solar Glare Analysis

Prepared for:

INNERGEX

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Table of Contents

List of Figures

List of Appendices

Acronyms and Abbreviations

Applicant	Innergex Renewable Development USA, LLC
ATC	air traffic control
ATCT	Air Traffic Control Tower
BESS	battery energy storage system
CFR	Code of Federal Regulations
DNI	direct normal irradiance
FAA	Federal Aviation Administration
MWac	megawatt of alternating current
NCT	Notice Criteria Tool
O&M	operations and maintenance
OEG	Obstruction Evaluation Group
Project	Wautoma Solar Energy Project
PV	photovoltaic
SAT	Single-axis trackers
SGHAT	Solar Glare Hazard Analysis Tool
SR	State Route

1.0   Overview

Innergex Renewable Development USA, LLC (the Applicant) proposes to construct and operate the Wautoma Solar Energy Project (Project). The Project is a 470-megawatt[1] solar photovoltaic (PV) generation facility coupled with a 4-hour battery energy storage system (BESS) sized to the maximum capacity of the Project, as well as related interconnection and ancillary support infrastructure, located in unincorporated Benton County, Washington (Figure 1).

2.0   Project Location and Site Setting

2.1   Location

The Project is generally located 12.5 miles northeast of the city of Sunnyside and 1 mile south of the State Route (SR) 241 and SR 24 interchange in Benton County, Washington.

This following terms are used to describe areas associated with Project development:

- **Project Lease Boundary**: The approximately 5,852-acre area that encompasses 35 privately owned assessor parcels that the Applicant has executed or is pursuing a Lease Agreement with the underlying property owner (Figure 2). Construction and operation of the Project are limited to the Project Area described below.

- **Project Area:** The approximately 4,573-acre area that includes all of the Project facilities, including solar PV system and BESS, Project substation, transmission line, operations and maintenance (O&M) building, and associated access roads.

2.2   Existing Setting

Current land uses in the Project Area include irrigated agriculture, rangeland, undeveloped land, local roads, and existing electrical utility infrastructure. Lands to the north, west, and south are zoned for agricultural purposes in Benton and Yakima counties with similar land uses as the Project Lease Boundary, as well as several rural residences. The Hanford Reach National Monument Rattlesnake Unit is located to the east.

The Project is located entirely on parcels in unincorporated Benton County within the Growth Management Act Agricultural District zone, defined by Benton County Code.

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[1] Megawatt rating provided in alternating current (MWac)

3.0 Glare Analysis

3.1 Background

Tetra Tech conducted a glare analysis of the proposed Project (Appendix A). The Federal Aviation Administration (FAA) developed a Technical Guidance for Evaluating Selected Solar Technologies on Airports in 2018 and a final policy in 2021.

As an industry standard, the term "glint and glare analysis" is typically used to describe an analysis of potential ocular impacts to defined receptors. ForgeSolar defines glint and glare in the following statement:

> *Glint is typically defined as a momentary flash of bright light, often caused by a reflection off a moving source. A typical example of glint is a momentary solar reflection from a moving car. Glare is defined as a continuous source of bright light. Glare is generally associated with stationary objects, which, due to the slow relative movement of the sun, reflect sunlight for a longer duration* (Sandia Laboratories 2016)*.*

Based on the ForgeSolar definitions of glint and glare and the unlikelihood that the Project's solar modules would rotate faster than the relative daily motion of the sun, the potential reflectance from the Project modeled throughout this report will be referred to as glare.

3.2 Regulatory

The FAA developed Technical Guidance for Evaluating Selected Solar Technologies on Airports in 2018 and finalized it in 2021 with 14 Code of Federal Regulations (CFR) Part 77 (86 FR 25801) (FAA 2021). The FAA's technical guidance is in addition to FAA regulatory guidance under 78 FR 63276 Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports (collectively referred to as FAA Guidance). The FAA Guidance recommends that glare analyses should be performed on a site-specific basis using the Sandia Laboratories Solar Glare Hazard Analysis Tool (SGHAT). This guidance applies to solar facilities located on federally obligated airport property; it is not mandatory for a proposed solar installation that is not on an airport (and for which a Form 7460-1 is filed with FAA pursuant to CFR Title 14 Part 77.9, as discussed below), but is considered to be an industry best practice for solar facilities in general. The SGHAT is the standard for measuring potential ocular impact as a result of solar facilities (78 FR 63276).

According to 78 FR 63276, the FAA has determined that "glint and glare from solar energy systems could result in an ocular impact to pilots and/or air traffic control (ATC) facilities and compromise the safety of the air transportation system" (FAA 2013). With the updated final FAA policy with 86 FR 25801, the narrative states that:

> *FAA has subsequently concluded that in most cases, the glint and glare from solar energy systems to pilots on final approach is similar to glint and glare pilots routinely experience from water bodies, glass facade buildings, parking lots, and similar features. However, FAA has continued to receive reports of potential glint and glare from on-airport solar energy systems on personnel working in Air Traffic Control Tower (ATCT) cabs. Therefore, FAA has determined the scope of agency policy should be focused on the impact of on-airport solar*

energy systems to federally-obligated towered airports, specifically the airport's ATCT cab (FAA 2021).

The FAA has developed the following criteria for analysis of solar energy projects located on jurisdictional airports:

- No potential for glint or glare in the existing or planned ATC tower cab.

- Glint or glare along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan is allowed. The final approach path is defined as 2 miles from 50 feet above the landing threshold using a standard three-degree glidepath.

3.3 Methodology

3.3.1 FAA Notice Criteria Tool

The online FAA Notice Criteria Tool (NCT) reports whether a proposed structure is in proximity to a jurisdictional air navigation facility and if formal submission to the FAA Obstruction Evaluation Group (OEG) under CFR Title 14 Part 77.9 (Safe, Efficient Use, and Preservation of the Navigable Airspace) is recommended (FAA 2010). The NCT also identifies final approach flight paths that may be considered vulnerable to a proposed structure's impact on navigation signal reception. The NCT was used to determine if the proposed Project is located within an FAA-identified impact area based on the Project area boundaries and height above ground surface (FAA 2022). The FAA NCT report stated that the Project Area does not exceed notice criteria (see Appendix B). Based on this information, there is no need to submit to FAA OEG.

3.3.2 Sandia Laboratories Solar Glare Hazard Analysis Tool

Tetra Tech used the SGHAT technology as part of an online tool (GlareGauge) developed by Sandia National Laboratories and hosted by ForgeSolar (Sandia Laboratories 2016). GlareGauge provides a quantitative assessment of the following:

- When and where glare has the potential to occur throughout the year for a defined solar array polygon; and

- Potential effects on the human eye at locations where glare is predicted.

The following statement was issued by Sandia Laboratories regarding the SGHAT technology:

Sandia developed SGHAT v. 3.0, a web-based tool and methodology to evaluate potential glint/glare associated with solar energy installations. The validated tool provides a quantified assessment of when and where glare will occur, as well as information about potential ocular impacts. The calculations and methods are based on analyses, test data, a database of different photovoltaic module surfaces (e.g. anti-reflective coating, texturing), and models developed over several years at Sandia. The results are presented in a simple easy-to-interpret plot that

specifies when glare will occur throughout the year, with color indicating the potential ocular hazard (Sandia Laboratories 2016)*.*

Note that technology changes continue to occur to address issues such as reflectivity. The model, therefore, presents a conservative assessment based on simplifying assumptions inherent in the model as well as industry improvements since the most recent update of such assumptions.

Based on the predicted retinal irradiance (intensity) and subtended angle (size/distance) of the glare source to receptor, the GlareGauge categorizes potential glare where it is predicted by the model to occur in accordance with three tiers of severity (ocular hazards) that are shown by different colors in the model output:

- Red glare: glare predicted with a potential for permanent eye damage (retinal burn)

- Yellow glare: glare predicted with a potential for temporary after-image

- Green glare: glare predicted with a low potential for temporary after-image

These categories of glare are calculated using a typical observer's blink response time, ocular transmission coefficient (the amount of radiation absorbed in the eye prior to reaching the retina), pupil diameter, and eye focal length (the distance between where rays intersect in the eye and the retina). As a point of comparison, direct viewing of the sun without a filter is considered to be on the border between yellow glare and red glare, while typical camera flashes are considered to be lower tier yellow glare (approximately 3 orders of magnitude less than direct viewing of the sun). Upon exposure to yellow glare, the observer may experience a temporary spot in their vision temporarily lasting after the exposure. Upon exposure to green glare, the observer may experience a bright reflection but typically no spot lasting after exposure.

3.3.3 Glare Analysis Assumptions

The GlareGauge model is bound by conservative limitations. The following assumptions provide a level of conservatism to the GlareGauge model:

- The GlareGauge model simulates solar arrays as infinitesimally small modules within planar convex polygons exemplifying the tilt and orientation characteristics defined by the user. Gaps between modules, variable heights of the solar array within the polygons, and supporting structures are not considered in the analysis. Since the actual module rows will be separated by open space, this model assumption could result in indication of glare in locations where solar modules will not be located. In addition, the supporting structures are considered to have reflectivity values that are negligible relative to the module surfaces included in the model.

- The GlareGauge model assumes that the observation point receptor can view the entire solar array segment when predicting glare minutes. However, it may be that the receptor at the observation point may only be able to view a small portion (typically the most proximal edge) of the solar array segment. Therefore, the predicted glare minutes and intensity from a specific solar array to a specific observation point are conservative because the observer will likely not experience glare from the entire solar array segment at once.

- The GlareGauge model does not consider obstacles (either man-made or natural) between the defined solar arrays and the receptors such as vegetative screening (existing or planted), buildings, topography, etc. Where such features exist, they would screen views of the Project, thus minimizing or eliminating glare from those locations.

- The GlareGauge model does not consider the potential effect of shading from existing topography between the sun and the Project outside of the defined areas.

- The direct normal irradiance (DNI) is defined as variable using a typical clear day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum of 1,000 watts per square meter at solar noon. The irradiance profile uses the coordinates from Google Maps and a sun position algorithm to scale the DNI throughout the year. The actual daily DNI would be affected by precipitation, cloud cover, atmospheric attenuation (radiation intensity affected by gaseous constituents), and other environmental factors not considered in the GlareGauge model. This may result in modeled predicted glare occurrences when in fact the glare is not actually occurring due to cloud cover, rain, or other atmospheric conditions.

Hazard zone boundaries shown in the Glare Hazard plots are an approximation; actual ocular impacts encompass a continuous, not discrete, spectrum.

3.3.4 Glare Analysis Methodology

The SGHAT (GlareGauge) was used to evaluate the potential for glare in areas surrounding the Project (Appendix A). The Project layout inputted into the GlareGauge model consists of 18 separate "PV Array Areas," which are segmented polygons generally representative of the proposed Project layout (Figure 1).

Two separate glare analyses were conducted that included three proximal segmented vehicular traffic routes and four observation points (Figure 2). The observation points correspond with four non-participating receptor residence locations as shown on Figure 2. The two analyses differ in the height assumed for these points with Analysis Scenario 1 representing the point of view from an average first floor residential/commercial structure and typical commuter car, while Analysis Scenario 2 represents the point of view from an average second floor residential/commercial structure and typical semi-tractor-trailer truck.

The glare analysis represents single-axis trackers, or SAT systems, which follow the rotation of the sun along the east-west axis throughout the day. SAT arrays are typically oriented with their axis of rotation aligned north to south. The rotation angles over which the modules track the sun was set to +/- 60° east to west.

3.4 Glare Impacts

Glare impact analysis was conducted for the two analysis scenarios (see Appendix A). There was no glare predicted for Analysis Scenario 1 (average first floor residential/commercial structure and typical commuter car) or Analysis Scenario 2 (average second floor residential/commercial structure and typical semi-tractor-trailer truck). SAT systems may reduce glare for nearby

receptors because they typically reduce the incidence angle between the modules and the sun, yielding smaller glancing angles and a higher vertical trajectory for glare reflections.

As previously noted, the GlareGauge model does not account for varying ambient conditions (i.e., cloudy days, precipitation); atmospheric attenuation; screening due to existing topography not located within the defined array layouts; or existing vegetation or structures (including fences or walls); therefore, the predicted results are considered to be conservative.

Based on the results of the FAA NCT, the Project does not need to formally file with the FAA OEG because it did not exceed notice criteria.

4.0 References

FAA (Federal Aviation Administration) 2010. CFR Title 14 Part 77.9 Notice of Proposed Construction or Alteration Requiring Notice.

FAA. 2013. Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports. 78 FR 63276. October 23, 2013.

FAA. 2021. FAA Policy: Review of Solar Energy System Projects on Federally-Obligated Airports. 86 FR 25801. May 11, 2021.

FAA. 2022. Federal Aviation Administration Notice Criteria Tool. Obstruction Evaluation Version 2018.1.4. Accessed online at: https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm.

Sandia Laboratories. 2016. Sandia Solar Glare Hazard Analysis Tool, GlareGauge hosted by ForgeSolar. Accessed online at: https://www.forgesolar.com/.

Figures

Wautoma Solar

Figure 1
PV Array Areas

BENTON AND YAKIMA COUNTIES, WA

Legend:
- Project Area
- Solar Array
- Array Analysis Areas
- County Boundary

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Reference Map

1:22,000   NAD 1983 StatePlane Washington South FIPS 4602 Feet

0 0.25 0.5 1 Miles
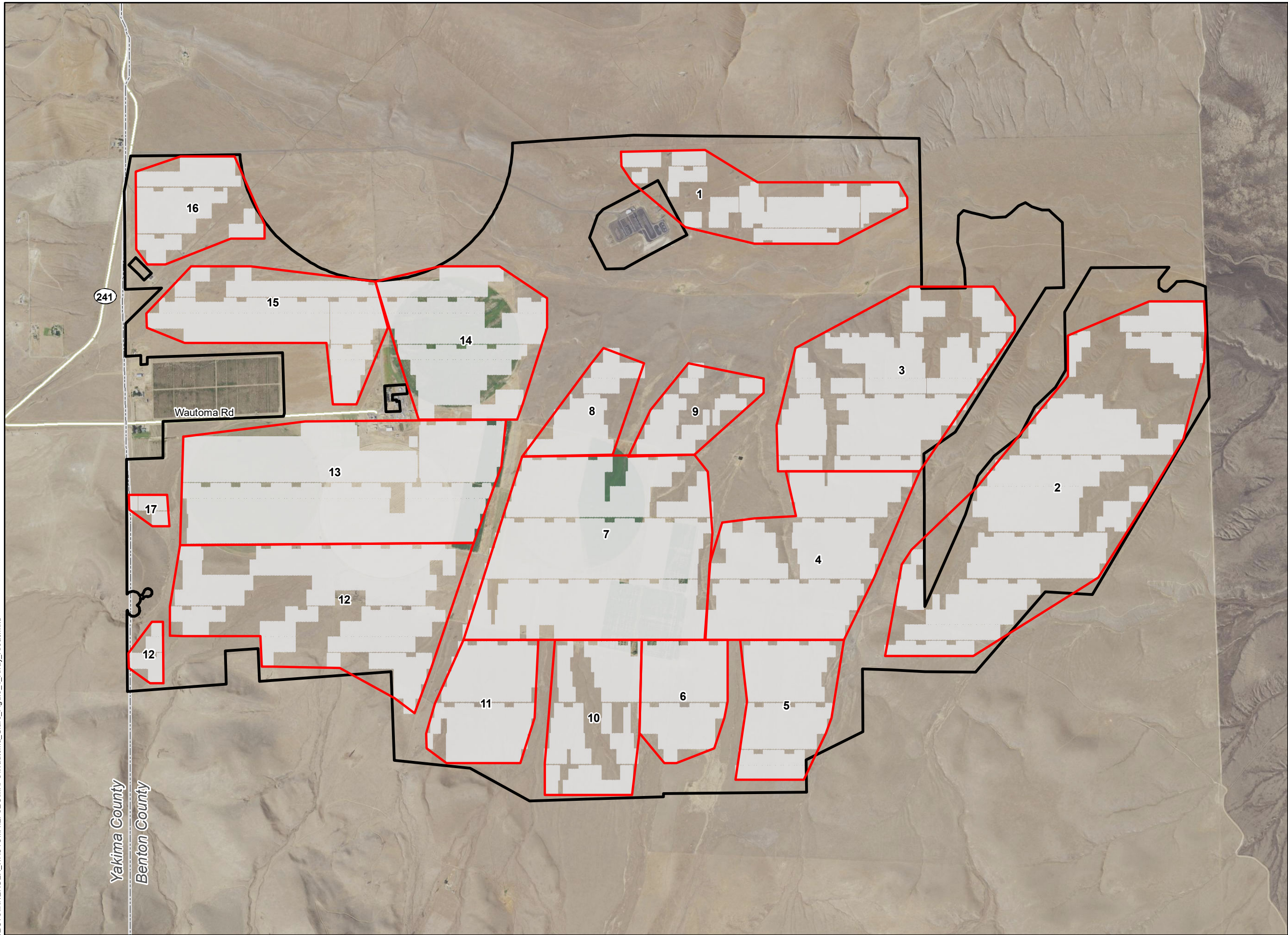
NOT FOR CONSTRUCTION

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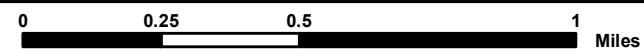
Wautoma Solar

**Figure 2
Receptors**

BENTON AND YAKIMA COUNTIES, WA

Project Area
Solar Array
Array Analysis Areas
Participating Receptor
Non-Participating Receptor
Observation Point
State Highway
Road Segment Analyzed
County Boundary

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Reference Map

1:80,000   NAD 1983 StatePlane Washington South FIPS 4602 Feet   0 0.5 1 2 Miles   NOT FOR CONSTRUCTION

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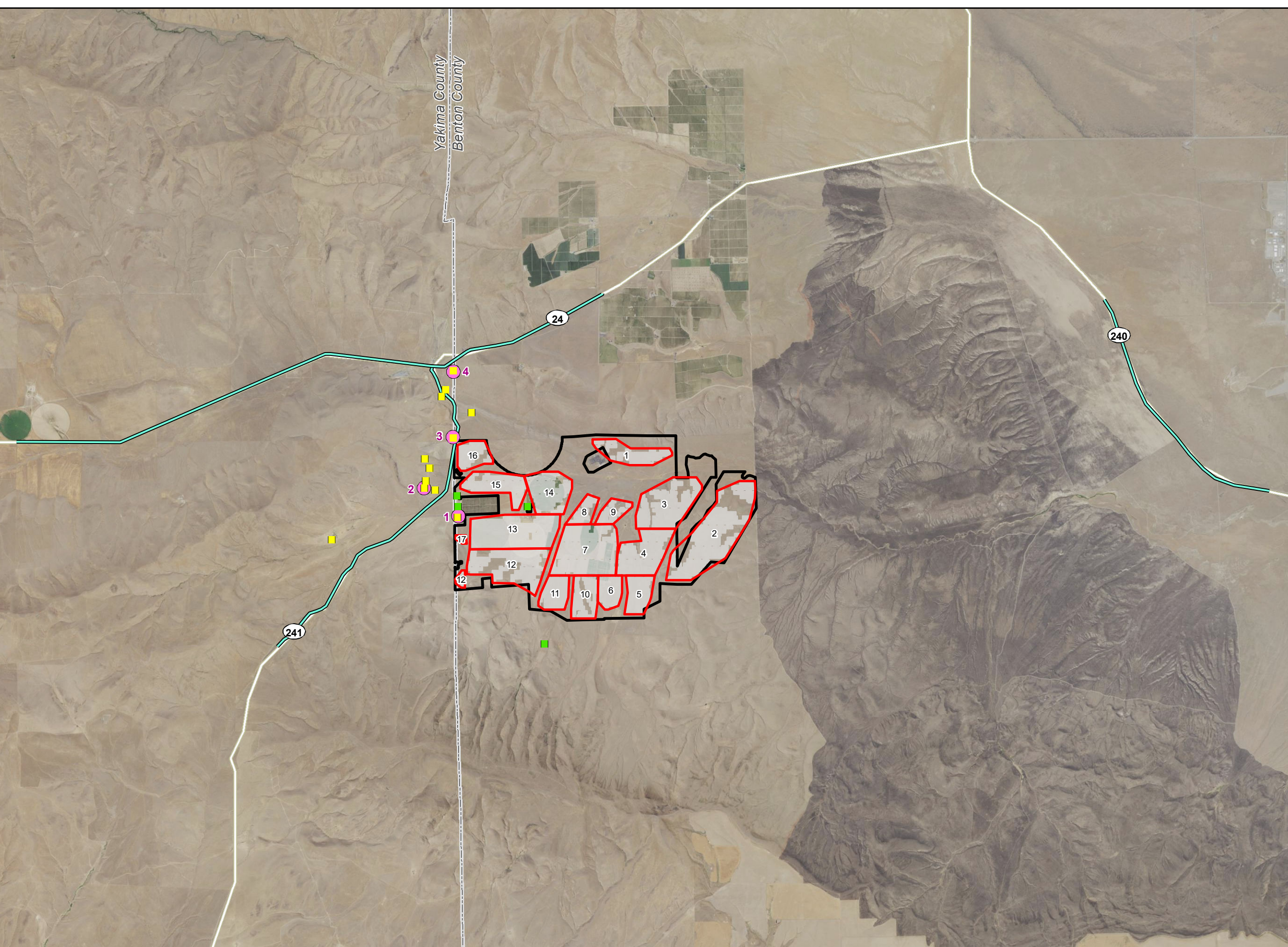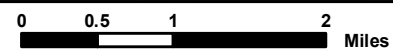
Appendix A: Sandia Glare Analysis Reports

FORGESOLAR GLARE ANALYSIS

Project: **Cypress Creek**

Site configuration: **Wautoma Analysis 1 04122022**

Analysis conducted by Drew Timmis (drew.timmis@tetratech.com) at 12:56 on 12 Apr, 2022.

U.S. FAA 2013 Policy Adherence

The following table summarizes the policy adherence of the glare analysis based on the 2013 U.S. Federal Aviation Administration Interim Policy 78 FR 63276. This policy requires the following criteria be met for solar energy systems on airport property:

- No "yellow" glare (potential for after-image) for any flight path from threshold to 2 miles
- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics (see list below)

ForgeSolar does not represent or speak officially for the FAA and cannot approve or deny projects. Results are informational only.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	N/A	No flight paths analyzed
ATCT(s)	N/A	No ATCT receptors designated

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at https://www.federalregister.gov/d/2013-24729

SITE CONFIGURATION

Analysis Parameters

DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 67483.11533
Methodology: V2

PV Array(s)

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.519418	-119.835278	1063.05	5.40	1068.45
2	46.519465	-119.828639	1055.05	5.40	1060.45
3	46.517683	-119.824512	1021.03	5.40	1026.43
4	46.517617	-119.813423	980.05	5.40	985.45
5	46.516793	-119.812729	946.05	5.40	951.45
6	46.516225	-119.812736	935.05	5.40	940.45
7	46.514313	-119.818217	946.05	5.40	951.45
8	46.514352	-119.824817	970.19	5.40	975.59
9	46.515286	-119.830262	997.05	5.40	1002.45
10	46.517719	-119.834392	1022.88	5.40	1028.28
11	46.518626	-119.835261	1042.52	5.40	1047.92

Name: PV array 10

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492876	-119.840810	1104.30	5.40	1109.70
2	46.492836	-119.833948	1103.24	5.40	1108.64
3	46.487755	-119.834186	1182.53	5.40	1187.93
4	46.484399	-119.834843	1255.12	5.40	1260.52
5	46.484439	-119.841704	1244.99	5.40	1250.39
6	46.486160	-119.841683	1212.70	5.40	1218.10

Name: PV array 11

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492917	-119.848023	1115.49	5.40	1120.89
2	46.492883	-119.842130	1107.03	5.40	1112.43
3	46.488623	-119.842445	1169.86	5.40	1175.26
4	46.486171	-119.843618	1222.15	5.40	1227.55
5	46.486204	-119.849423	1245.20	5.40	1250.60
6	46.487033	-119.850997	1240.64	5.40	1246.04
7	46.487825	-119.851014	1225.33	5.40	1230.73
8	46.489460	-119.850290	1186.50	5.40	1191.90

Name: PV array 12
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.488922	-119.851996	1211.16	5.40	1216.56
2	46.491463	-119.850623	1151.03	5.40	1156.43
3	46.498229	-119.847233	1071.13	5.40	1076.53
4	46.498200	-119.870450	1217.24	5.40	1222.64
5	46.494828	-119.871187	1287.29	5.40	1292.69
6	46.494019	-119.871171	1308.65	5.40	1314.05
7	46.493295	-119.870192	1318.88	5.40	1324.28
8	46.493236	-119.864098	1239.05	5.40	1244.45
9	46.491581	-119.864056	1244.39	5.40	1249.79
10	46.491493	-119.857833	1216.22	5.40	1221.62
11	46.489779	-119.853541	1213.60	5.40	1219.00

Name: PV array 13
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.498200	-119.870312	1219.25	5.40	1224.65
2	46.498180	-119.847146	1071.25	5.40	1076.65
3	46.502347	-119.844896	1050.53	5.40	1055.93
4	46.504886	-119.844514	1043.64	5.40	1049.04
5	46.504925	-119.851377	1054.96	5.40	1060.36
6	46.504866	-119.860353	1093.79	5.40	1099.19
7	46.504100	-119.869980	1153.24	5.40	1158.64

Name: PV array 14

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.504925	-119.851377	1054.81	5.40	1060.21
2	46.504881	-119.843634	1039.87	5.40	1045.27
3	46.509866	-119.841198	1028.36	5.40	1033.76
4	46.511478	-119.841178	1009.76	5.40	1015.16
5	46.513221	-119.844941	1036.83	5.40	1042.23
6	46.513248	-119.849632	1036.88	5.40	1042.28
7	46.512457	-119.854746	1065.78	5.40	1071.18

Name: PV array 15

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.509938	-119.853781	1064.50	5.40	1069.90
2	46.505772	-119.856295	1079.09	5.40	1084.49
3	46.505783	-119.858142	1089.01	5.40	1094.41
4	46.509146	-119.858631	1084.87	5.40	1090.27
5	46.509208	-119.869806	1050.57	5.40	1055.97
6	46.510044	-119.872789	1168.71	5.40	1174.11
7	46.510836	-119.872806	1167.94	5.40	1173.34
8	46.513358	-119.869257	1132.93	5.40	1138.33
9	46.513332	-119.864566	1111.49	5.40	1116.89
10	46.512457	-119.854746	1065.48	5.40	1070.88

Name: PV array 16
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
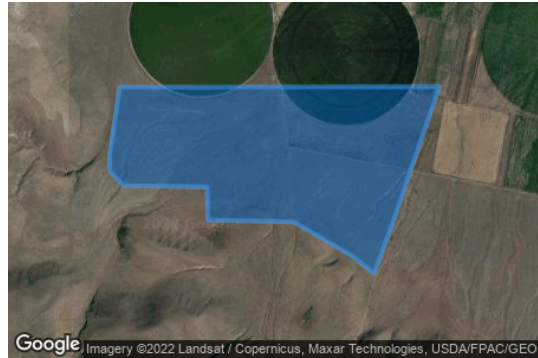**Panel material**: Smooth glass with AR coating
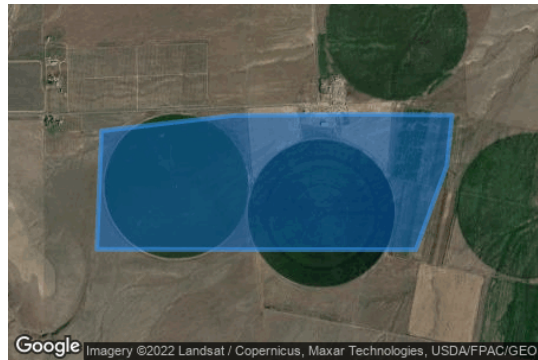**Reflectivity**: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.518553	-119.873551	1124.45	5.40	1129.86
2	46.519353	-119.870021	1103.73	5.40	1109.13
3	46.519330	-119.865770	1089.45	5.40	1094.85
4	46.515633	-119.863435	1094.46	5.40	1099.86
5	46.514841	-119.863444	1097.21	5.40	1102.61
6	46.514856	-119.866084	1110.91	5.40	1116.31
7	46.513486	-119.871295	1141.51	5.40	1146.91
8	46.513494	-119.872703	1144.76	5.40	1150.16
9	46.514319	-119.873574	1141.44	5.40	1146.84

Name: PV array 17
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.500942	-119.874303	1176.45	5.40	1181.85
2	46.500925	-119.871285	1179.42	5.40	1184.82
3	46.499230	-119.871129	1203.26	5.40	1208.66
4	46.499237	-119.872449	1201.33	5.40	1206.73
5	46.500149	-119.874286	1182.92	5.40	1188.32

Name: PV array 18

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492353	-119.874467	1374.91	5.40	1380.32
2	46.491555	-119.874446	1382.72	5.40	1388.12
3	46.490713	-119.872794	1401.04	5.40	1406.44
4	46.490713	-119.871721	1394.50	5.40	1399.90
5	46.494037	-119.871632	1319.94	5.40	1325.34
6	46.494024	-119.872539	1333.24	5.40	1338.64

Name: PV array 2

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.509195	-119.800170	1712.97	5.40	1718.37
2	46.511028	-119.793712	1855.47	5.40	1860.87
3	46.511001	-119.789373	2000.86	5.40	2006.26
4	46.509389	-119.789306	2100.83	5.40	2106.23
5	46.507668	-119.789417	2191.34	5.40	2196.74
6	46.503498	-119.791143	2390.50	5.40	2395.90
7	46.500156	-119.794090	2281.15	5.40	2286.55
8	46.496000	-119.797927	2425.13	5.40	2430.53
9	46.491798	-119.807835	2303.99	5.40	2309.39
10	46.491840	-119.814784	2213.16	5.40	2218.56
11	46.496804	-119.813428	2195.98	5.40	2201.38
12	46.497619	-119.812626	2192.87	5.40	2198.27
13	46.501030	-119.807392	2087.01	5.40	2092.41
14	46.506988	-119.800172	1934.89	5.40	1940.29

Name: PV array 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.511944	-119.812619	1594.47	5.40	1599.87
2	46.511903	-119.805993	1692.00	5.40	1697.40
3	46.510254	-119.804342	2014.11	5.40	2019.51
4	46.509462	-119.804352	1988.23	5.40	1993.63
5	46.501885	-119.811928	1835.91	5.40	1841.31
6	46.501952	-119.823102	1705.10	5.40	1710.50
7	46.504466	-119.823185	1549.70	5.40	1555.10
8	46.508637	-119.821637	1474.03	5.40	1479.43

Name: PV array 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.501948	-119.822486	1065.13	5.40	1070.53
2	46.501885	-119.811928	1048.71	5.40	1054.11
3	46.496088	-119.815608	1069.83	5.40	1075.23
4	46.492742	-119.818026	1106.54	5.40	1111.94
5	46.492807	-119.829022	1099.23	5.40	1104.63
6	46.496957	-119.828557	1070.05	5.40	1075.45
7	46.499186	-119.827535	1041.49	5.40	1046.89
8	46.499395	-119.824981	1069.48	5.40	1074.88
9	46.499485	-119.821725	1062.62	5.40	1068.02

Name: PV array 5

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

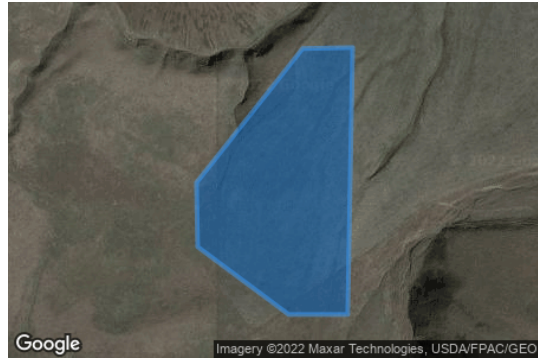**Panel material**: Smooth glass with AR coating
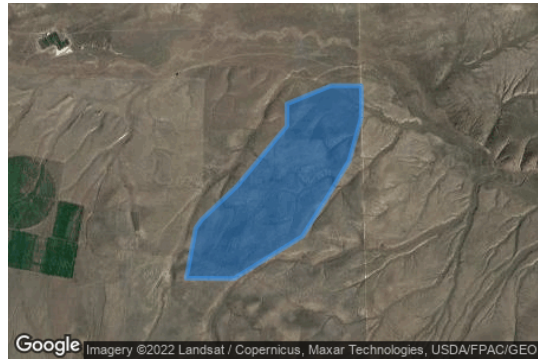
Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492742	-119.818026	1107.38	5.40	1112.78
2	46.488486	-119.819047	1146.48	5.40	1151.88
3	46.487669	-119.819497	1161.15	5.40	1166.55
4	46.485139	-119.821288	1179.77	5.40	1185.17
5	46.485170	-119.826653	1214.13	5.40	1219.53
6	46.489427	-119.825721	1149.58	5.40	1154.98
7	46.492791	-119.826207	1106.29	5.40	1111.69

Name: PV array 6

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492836	-119.833948	1103.20	5.40	1108.60
2	46.492796	-119.827174	1103.83	5.40	1109.23
3	46.489436	-119.827216	1149.64	5.40	1155.04
4	46.486901	-119.828303	1190.43	5.40	1195.83
5	46.486100	-119.831304	1209.48	5.40	1214.88
6	46.486105	-119.832271	1211.64	5.40	1217.04
7	46.487755	-119.834186	1182.61	5.40	1188.01

Name: PV array 7

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492917	-119.848023	1115.08	5.40	1120.48
2	46.492807	-119.829022	1101.23	5.40	1106.63
3	46.498622	-119.828334	1041.88	5.40	1047.28
4	46.500345	-119.828489	1035.15	5.40	1040.55
5	46.501957	-119.828645	1203.65	5.40	1209.05
6	46.502893	-119.829690	1026.52	5.40	1031.92
7	46.502862	-119.843267	1037.85	5.40	1043.25

Name: PV array 8

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.508726	-119.836772	1020.94	5.40	1026.34
2	46.507888	-119.833588	1019.95	5.40	1025.35
3	46.502930	-119.836112	1033.42	5.40	1038.82
4	46.502862	-119.843267	1037.20	5.40	1042.60

Name: PV array 9

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating
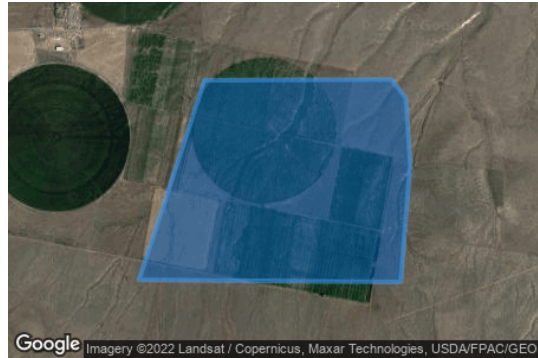
Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.502814	-119.834908	1033.64	5.40	1039.04
2	46.505344	-119.833118	1027.71	5.40	1033.11
3	46.507867	-119.830095	1004.15	5.40	1009.55
4	46.507013	-119.824183	997.71	5.40	1003.11
5	46.506221	-119.824193	1005.16	5.40	1010.56
6	46.502893	-119.829690	1025.80	5.40	1031.20

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	46.504524	-119.873315	1171.36	6.00
OP 2	2	46.510264	-119.882975	1359.86	6.00
OP 3	3	46.519947	-119.874721	1143.93	6.00
OP 4	4	46.533278	-119.874839	1291.04	6.00

Route Receptor(s)

Name: Highway 24
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.519890	-119.997670	1634.52	5.00	1639.52
2	46.519624	-119.969346	1545.69	5.00	1550.69
3	46.522814	-119.958274	1481.59	5.00	1486.59
4	46.530815	-119.930637	1417.09	5.00	1422.09
5	46.536424	-119.910981	1355.33	5.00	1360.33
6	46.536454	-119.909351	1351.83	5.00	1356.83
7	46.533974	-119.880254	1274.23	5.00	1279.23
8	46.533915	-119.878065	1291.74	5.00	1296.74
9	46.534092	-119.876563	1304.75	5.00	1309.75
10	46.537074	-119.869697	1431.58	5.00	1436.58
11	46.537605	-119.864332	1471.77	5.00	1476.77
12	46.538314	-119.859526	1461.48	5.00	1466.48
13	46.539436	-119.854934	1451.11	5.00	1456.11
14	46.541827	-119.848153	1438.48	5.00	1443.48
15	46.547110	-119.833991	1479.68	5.00	1484.68

Name: Highway 240
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.507988	-119.642617	614.88	5.00	619.88
2	46.509081	-119.651157	629.17	5.00	634.17
3	46.509731	-119.655105	631.02	5.00	636.02
4	46.511591	-119.660555	632.99	5.00	637.99
5	46.513777	-119.664160	636.20	5.00	641.20
6	46.518177	-119.669524	637.60	5.00	642.60
7	46.525766	-119.678580	639.25	5.00	644.25
8	46.527125	-119.679867	637.13	5.00	642.13
9	46.543066	-119.687721	641.81	5.00	646.81
10	46.545008	-119.688950	643.74	5.00	648.74

Name: Highway 241
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.484548	-119.917503	1864.29	5.00	1869.29
2	46.485405	-119.916366	1839.71	5.00	1844.71
3	46.485966	-119.915229	1820.79	5.00	1825.79
4	46.486306	-119.913813	1800.68	5.00	1805.68
5	46.486676	-119.912375	1780.42	5.00	1785.42
6	46.487414	-119.911066	1760.79	5.00	1765.79
7	46.488936	-119.909628	1726.39	5.00	1731.39
8	46.493589	-119.906023	1615.97	5.00	1620.97
9	46.493944	-119.905530	1606.37	5.00	1611.37
10	46.494815	-119.904135	1581.04	5.00	1586.04
11	46.497133	-119.901981	1542.39	5.00	1547.39
12	46.498373	-119.899771	1501.10	5.00	1506.11
13	46.499378	-119.895780	1433.76	5.00	1438.76
14	46.500013	-119.893119	1395.77	5.00	1400.77
15	46.500338	-119.892282	1382.41	5.00	1387.41
16	46.508564	-119.878442	1218.39	5.00	1223.40
17	46.509524	-119.876961	1195.26	5.00	1200.26
18	46.510292	-119.876489	1189.17	5.00	1194.17
19	46.521780	-119.873421	1130.93	5.00	1135.93
20	46.522489	-119.873485	1130.79	5.00	1135.79
21	46.523449	-119.874429	1131.99	5.00	1136.99
22	46.524113	-119.874580	1131.08	5.00	1136.08
23	46.525560	-119.874172	1129.08	5.00	1134.08
24	46.526623	-119.874322	1140.42	5.00	1145.42
25	46.527627	-119.875266	1154.05	5.00	1159.05
26	46.529088	-119.877970	1179.84	5.00	1184.84
27	46.531421	-119.879343	1218.33	5.00	1223.34
28	46.532484	-119.880309	1239.69	5.00	1244.69
29	46.533148	-119.880545	1257.80	5.00	1262.80
30	46.533783	-119.880480	1272.13	5.00	1277.13

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PV array 1	SA tracking	SA tracking	0	0	-
PV array 10	SA tracking	SA tracking	0	0	-
PV array 11	SA tracking	SA tracking	0	0	-
PV array 12	SA tracking	SA tracking	0	0	-
PV array 13	SA tracking	SA tracking	0	0	-
PV array 14	SA tracking	SA tracking	0	0	-
PV array 15	SA tracking	SA tracking	0	0	-
PV array 16	SA tracking	SA tracking	0	0	-
PV array 17	SA tracking	SA tracking	0	0	-
PV array 18	SA tracking	SA tracking	0	0	-
PV array 2	SA tracking	SA tracking	0	0	-
PV array 3	SA tracking	SA tracking	0	0	-
PV array 4	SA tracking	SA tracking	0	0	-
PV array 5	SA tracking	SA tracking	0	0	-
PV array 6	SA tracking	SA tracking	0	0	-
PV array 7	SA tracking	SA tracking	0	0	-
PV array 8	SA tracking	SA tracking	0	0	-
PV array 9	SA tracking	SA tracking	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Results for: PV array 1

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 10

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 11

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 12

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 13

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 14

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 15

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 16

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 17

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 18

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 2

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 3

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 4

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 5

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 6

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 7

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 8

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 9

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

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.

Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 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.)

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.

The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.

Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.

Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

FORGESOLAR GLARE ANALYSIS

Project: **Cypress Creek**
Site configuration: **Wautoma Analysis 2 04122022**
Analysis conducted by Drew Timmis (drew.timmis@tetratech.com) at 13:16 on 12 Apr, 2022.

U.S. FAA 2013 Policy Adherence

The following table summarizes the policy adherence of the glare analysis based on the 2013 U.S. Federal Aviation Administration Interim Policy 78 FR 63276. This policy requires the following criteria be met for solar energy systems on airport property:

- No "yellow" glare (potential for after-image) for any flight path from threshold to 2 miles
- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics (see list below)

ForgeSolar does not represent or speak officially for the FAA and cannot approve or deny projects. Results are informational only.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	N/A	No flight paths analyzed
ATCT(s)	N/A	No ATCT receptors designated

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at https://www.federalregister.gov/d/2013-24729

SITE CONFIGURATION

Analysis Parameters

DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 67484.11533
Methodology: V2

PV Array(s)

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.519418	-119.835278	1063.05	5.40	1068.45
2	46.519465	-119.828639	1055.05	5.40	1060.45
3	46.517683	-119.824512	1021.03	5.40	1026.43
4	46.517617	-119.813423	980.05	5.40	985.45
5	46.516793	-119.812729	946.05	5.40	951.45
6	46.516225	-119.812736	935.05	5.40	940.45
7	46.514313	-119.818217	946.05	5.40	951.45
8	46.514352	-119.824817	970.19	5.40	975.59
9	46.515286	-119.830262	997.05	5.40	1002.45
10	46.517719	-119.834392	1022.88	5.40	1028.28
11	46.518626	-119.835261	1042.52	5.40	1047.92

Name: PV array 10

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492876	-119.840810	1104.30	5.40	1109.70
2	46.492836	-119.833948	1103.24	5.40	1108.64
3	46.487755	-119.834186	1182.53	5.40	1187.93
4	46.484399	-119.834843	1255.12	5.40	1260.52
5	46.484439	-119.841704	1244.99	5.40	1250.39
6	46.486160	-119.841683	1212.70	5.40	1218.10

Name: PV array 11

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492917	-119.848023	1115.49	5.40	1120.89
2	46.492883	-119.842130	1107.03	5.40	1112.43
3	46.488623	-119.842445	1169.86	5.40	1175.26
4	46.486171	-119.843618	1222.15	5.40	1227.55
5	46.486204	-119.849423	1245.20	5.40	1250.60
6	46.487033	-119.850997	1240.64	5.40	1246.04
7	46.487825	-119.851014	1225.33	5.40	1230.73
8	46.489460	-119.850290	1186.50	5.40	1191.90

Name: PV array 12
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.488922	-119.851996	1211.16	5.40	1216.56
2	46.491463	-119.850623	1151.03	5.40	1156.43
3	46.498229	-119.847233	1071.13	5.40	1076.53
4	46.498200	-119.870450	1217.24	5.40	1222.64
5	46.494828	-119.871187	1287.29	5.40	1292.69
6	46.494019	-119.871171	1308.65	5.40	1314.05
7	46.493295	-119.870192	1318.88	5.40	1324.28
8	46.493236	-119.864098	1239.05	5.40	1244.45
9	46.491581	-119.864056	1244.39	5.40	1249.79
10	46.491493	-119.857833	1216.22	5.40	1221.62
11	46.489779	-119.853541	1213.60	5.40	1219.00

Name: PV array 13
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
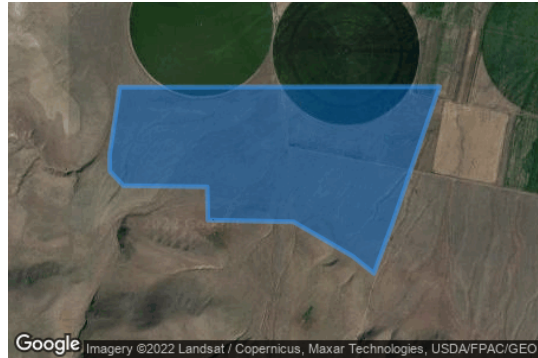**Panel material**: Smooth glass with AR coating
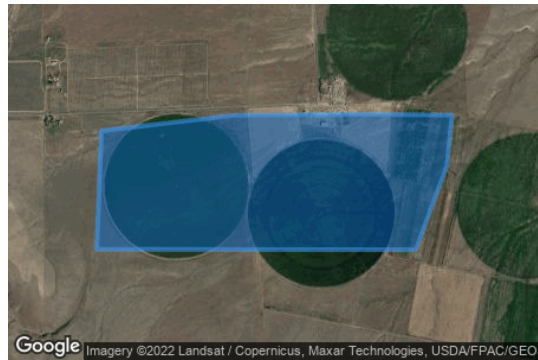**Reflectivity**: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.498200	-119.870312	1219.25	5.40	1224.65
2	46.498180	-119.847146	1071.25	5.40	1076.65
3	46.502347	-119.844896	1050.53	5.40	1055.93
4	46.504886	-119.844514	1043.64	5.40	1049.04
5	46.504925	-119.851377	1054.96	5.40	1060.36
6	46.504866	-119.860353	1093.79	5.40	1099.19
7	46.504100	-119.869980	1153.24	5.40	1158.64

Name: PV array 14
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.504925	-119.851377	1054.81	5.40	1060.21
2	46.504881	-119.843634	1039.87	5.40	1045.27
3	46.509866	-119.841198	1028.36	5.40	1033.76
4	46.511478	-119.841178	1009.76	5.40	1015.16
5	46.513221	-119.844941	1036.83	5.40	1042.23
6	46.513248	-119.849632	1036.88	5.40	1042.28
7	46.512457	-119.854746	1065.78	5.40	1071.18

Name: PV array 15
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.509938	-119.853781	1064.50	5.40	1069.90
2	46.505772	-119.856295	1079.09	5.40	1084.49
3	46.505783	-119.858142	1089.01	5.40	1094.41
4	46.509146	-119.858631	1084.87	5.40	1090.27
5	46.509208	-119.869806	1050.57	5.40	1055.97
6	46.510044	-119.872789	1168.71	5.40	1174.11
7	46.510836	-119.872806	1167.94	5.40	1173.34
8	46.513358	-119.869257	1132.93	5.40	1138.33
9	46.513332	-119.864566	1111.49	5.40	1116.89
10	46.512457	-119.854746	1065.48	5.40	1070.88

Name: PV array 16
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.518553	-119.873551	1124.45	5.40	1129.86
2	46.519353	-119.870021	1103.73	5.40	1109.13
3	46.519330	-119.865770	1089.45	5.40	1094.85
4	46.515633	-119.863435	1094.46	5.40	1099.86
5	46.514841	-119.863444	1097.21	5.40	1102.61
6	46.514856	-119.866084	1110.91	5.40	1116.31
7	46.513486	-119.871295	1141.51	5.40	1146.91
8	46.513494	-119.872703	1144.76	5.40	1150.16
9	46.514319	-119.873574	1141.44	5.40	1146.84

Name: PV array 17
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.500942	-119.874303	1176.45	5.40	1181.85
2	46.500925	-119.871285	1179.42	5.40	1184.82
3	46.499230	-119.871129	1203.26	5.40	1208.66
4	46.499237	-119.872449	1201.33	5.40	1206.73
5	46.500149	-119.874286	1182.92	5.40	1188.32

Name: PV array 18
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492353	-119.874467	1374.91	5.40	1380.32
2	46.491555	-119.874446	1382.72	5.40	1388.12
3	46.490713	-119.872794	1401.04	5.40	1406.44
4	46.490713	-119.871721	1394.50	5.40	1399.90
5	46.494037	-119.871632	1319.94	5.40	1325.34
6	46.494024	-119.872539	1333.24	5.40	1338.64

Name: PV array 2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
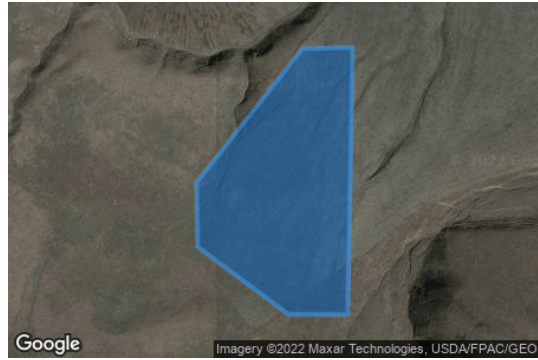**Panel material**: Smooth glass with AR coating
Reflectivity: Vary with sun
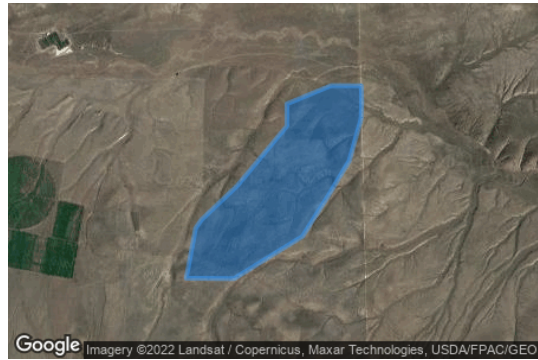**Slope error**: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.509195	-119.800170	1712.97	5.40	1718.37
2	46.511028	-119.793712	1855.47	5.40	1860.87
3	46.511001	-119.789373	2000.86	5.40	2006.26
4	46.509389	-119.789306	2100.83	5.40	2106.23
5	46.507668	-119.789417	2191.34	5.40	2196.74
6	46.503498	-119.791143	2390.50	5.40	2395.90
7	46.500156	-119.794090	2281.15	5.40	2286.55
8	46.496000	-119.797927	2425.13	5.40	2430.53
9	46.491798	-119.807835	2303.99	5.40	2309.39
10	46.491840	-119.814784	2213.16	5.40	2218.56
11	46.496804	-119.813428	2195.98	5.40	2201.38
12	46.497619	-119.812626	2192.87	5.40	2198.27
13	46.501030	-119.807392	2087.01	5.40	2092.41
14	46.506988	-119.800172	1934.89	5.40	1940.29

Name: PV array 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.511944	-119.812619	1594.47	5.40	1599.87
2	46.511903	-119.805993	1692.00	5.40	1697.40
3	46.510254	-119.804342	2014.11	5.40	2019.51
4	46.509462	-119.804352	1988.23	5.40	1993.63
5	46.501885	-119.811928	1835.91	5.40	1841.31
6	46.501952	-119.823102	1705.10	5.40	1710.50
7	46.504466	-119.823185	1549.70	5.40	1555.10
8	46.508637	-119.821637	1474.03	5.40	1479.43

Name: PV array 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.3
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.501948	-119.822486	1065.13	5.40	1070.53
2	46.501885	-119.811928	1048.71	5.40	1054.11
3	46.496088	-119.815608	1069.83	5.40	1075.23
4	46.492742	-119.818026	1106.54	5.40	1111.94
5	46.492807	-119.829022	1099.23	5.40	1104.63
6	46.496957	-119.828557	1070.05	5.40	1075.45
7	46.499186	-119.827535	1041.49	5.40	1046.89
8	46.499395	-119.824981	1069.48	5.40	1074.88
9	46.499485	-119.821725	1062.62	5.40	1068.02

Name: PV array 5

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492742	-119.818026	1107.38	5.40	1112.78
2	46.488486	-119.819047	1146.48	5.40	1151.88
3	46.487669	-119.819497	1161.15	5.40	1166.55
4	46.485139	-119.821288	1179.77	5.40	1185.17
5	46.485170	-119.826653	1214.13	5.40	1219.53
6	46.489427	-119.825721	1149.58	5.40	1154.98
7	46.492791	-119.826207	1106.29	5.40	1111.69

Name: PV array 6

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492836	-119.833948	1103.20	5.40	1108.60
2	46.492796	-119.827174	1103.83	5.40	1109.23
3	46.489436	-119.827216	1149.64	5.40	1155.04
4	46.486901	-119.828303	1190.43	5.40	1195.83
5	46.486100	-119.831304	1209.48	5.40	1214.88
6	46.486105	-119.832271	1211.64	5.40	1217.04
7	46.487755	-119.834186	1182.61	5.40	1188.01

Name: PV array 7

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

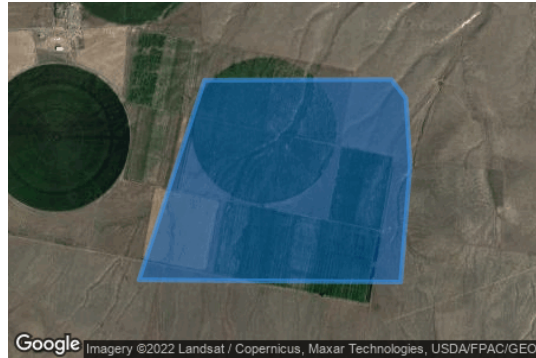**Reflectivity**: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.492917	-119.848023	1115.08	5.40	1120.48
2	46.492807	-119.829022	1101.23	5.40	1106.63
3	46.498622	-119.828334	1041.88	5.40	1047.28
4	46.500345	-119.828489	1035.15	5.40	1040.55
5	46.501957	-119.828645	1203.65	5.40	1209.05
6	46.502893	-119.829690	1026.52	5.40	1031.92
7	46.502862	-119.843267	1037.85	5.40	1043.25

Name: PV array 8

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.508726	-119.836772	1020.94	5.40	1026.34
2	46.507888	-119.833588	1019.95	5.40	1025.35
3	46.502930	-119.836112	1033.42	5.40	1038.82
4	46.502862	-119.843267	1037.20	5.40	1042.60

Name: PV array 9

Axis tracking: Single-axis rotation

Backtracking: Shade-slope

Tracking axis orientation: 180.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Ground Coverage Ratio: 0.3

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.502814	-119.834908	1033.64	5.40	1039.04
2	46.505344	-119.833118	1027.71	5.40	1033.11
3	46.507867	-119.830095	1004.15	5.40	1009.55
4	46.507013	-119.824183	997.71	5.40	1003.11
5	46.506221	-119.824193	1005.16	5.40	1010.56
6	46.502893	-119.829690	1025.80	5.40	1031.20

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	46.504524	-119.873315	1171.36	16.00
OP 2	2	46.510264	-119.882975	1359.86	16.00
OP 3	3	46.519947	-119.874721	1143.93	16.00
OP 4	4	46.533278	-119.874839	1291.04	16.00

Route Receptor(s)

Name: Highway 24
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.519890	-119.997670	1634.52	9.00	1643.52
2	46.519624	-119.969346	1545.69	9.00	1554.69
3	46.522814	-119.958274	1481.59	9.00	1490.59
4	46.530815	-119.930637	1417.09	9.00	1426.09
5	46.536424	-119.910981	1355.33	9.00	1364.33
6	46.536454	-119.909351	1351.83	9.00	1360.83
7	46.533974	-119.880254	1274.23	9.00	1283.23
8	46.533915	-119.878065	1291.74	9.00	1300.74
9	46.534092	-119.876563	1304.75	9.00	1313.75
10	46.537074	-119.869697	1431.58	9.00	1440.58
11	46.537605	-119.864332	1471.77	9.00	1480.77
12	46.538314	-119.859526	1461.48	9.00	1470.48
13	46.539436	-119.854934	1451.11	9.00	1460.11
14	46.541827	-119.848153	1438.48	9.00	1447.48
15	46.547110	-119.833991	1479.68	9.00	1488.68

Name: Highway 240
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.507988	-119.642617	614.88	9.00	623.88
2	46.509081	-119.651157	629.17	9.00	638.17
3	46.509731	-119.655105	631.02	9.00	640.03
4	46.511591	-119.660555	632.99	9.00	641.99
5	46.513777	-119.664160	636.20	9.00	645.20
6	46.518177	-119.669524	637.60	9.00	646.60
7	46.525766	-119.678580	639.25	9.00	648.25
8	46.527125	-119.679867	637.13	9.00	646.13
9	46.543066	-119.687721	641.81	9.00	650.81
10	46.545008	-119.688950	643.74	9.00	652.74

Name: Highway 241
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.484548	-119.917503	1864.29	9.00	1873.29
2	46.485405	-119.916366	1839.71	9.00	1848.71
3	46.485966	-119.915229	1820.79	9.00	1829.79
4	46.486306	-119.913813	1800.68	9.00	1809.68
5	46.486676	-119.912375	1780.42	9.00	1789.42
6	46.487414	-119.911066	1760.79	9.00	1769.79
7	46.488936	-119.909628	1726.39	9.00	1735.39
8	46.493589	-119.906023	1615.97	9.00	1624.97
9	46.493944	-119.905530	1606.37	9.00	1615.37
10	46.494815	-119.904135	1581.04	9.00	1590.04
11	46.497133	-119.901981	1542.39	9.00	1551.39
12	46.498373	-119.899771	1501.10	9.00	1510.11
13	46.499378	-119.895780	1433.76	9.00	1442.76
14	46.500013	-119.893119	1395.77	9.00	1404.77
15	46.500338	-119.892282	1382.41	9.00	1391.41
16	46.508564	-119.878442	1218.39	9.00	1227.40
17	46.509524	-119.876961	1195.26	9.00	1204.26
18	46.510292	-119.876489	1189.17	9.00	1198.17
19	46.521780	-119.873421	1130.93	9.00	1139.93
20	46.522489	-119.873485	1130.79	9.00	1139.79
21	46.523449	-119.874429	1131.99	9.00	1140.99
22	46.524113	-119.874580	1131.08	9.00	1140.09
23	46.525560	-119.874172	1129.08	9.00	1138.08
24	46.526623	-119.874322	1140.42	9.00	1149.42
25	46.527627	-119.875266	1154.05	9.00	1163.05
26	46.529088	-119.877970	1179.84	9.00	1188.84
27	46.531421	-119.879343	1218.33	9.00	1227.34
28	46.532484	-119.880309	1239.69	9.00	1248.69
29	46.533148	-119.880545	1257.80	9.00	1266.80
30	46.533783	-119.880480	1272.13	9.00	1281.13

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PV array 1	SA tracking	SA tracking	0	0	-
PV array 10	SA tracking	SA tracking	0	0	-
PV array 11	SA tracking	SA tracking	0	0	-
PV array 12	SA tracking	SA tracking	0	0	-
PV array 13	SA tracking	SA tracking	0	0	-
PV array 14	SA tracking	SA tracking	0	0	-
PV array 15	SA tracking	SA tracking	0	0	-
PV array 16	SA tracking	SA tracking	0	0	-
PV array 17	SA tracking	SA tracking	0	0	-
PV array 18	SA tracking	SA tracking	0	0	-
PV array 2	SA tracking	SA tracking	0	0	-
PV array 3	SA tracking	SA tracking	0	0	-
PV array 4	SA tracking	SA tracking	0	0	-
PV array 5	SA tracking	SA tracking	0	0	-
PV array 6	SA tracking	SA tracking	0	0	-
PV array 7	SA tracking	SA tracking	0	0	-
PV array 8	SA tracking	SA tracking	0	0	-
PV array 9	SA tracking	SA tracking	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Results for: PV array 1

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 10

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 11

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 12

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 13

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 14

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 15

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 16

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 17

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 18

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 2

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 3

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 4

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 5

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 6

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 7

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 8

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 9

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
Highway 24	0	0
Highway 240	0	0
Highway 241	0	0

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 24

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 240

0 minutes of yellow glare
0 minutes of green glare

Route: Highway 241

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

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.

Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 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.)

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.

The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.

Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.

Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Appendix B: FAA Notice Criteria Tool

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

Field	Value
Latitude:	46 Deg 29 M 57.76 S N
Longitude:	119 Deg 50 M 21.42 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	1047 (nearest foot)
Structure Height :	12 (nearest foot)
Traverseway:	No Traverseway

(Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway

Is structure on airport: ● No ○ Yes

Results

You do not exceed Notice Criteria.