

Voice: (717) 359-4500
Web: www.mtjoytwp.us

ZONING PERMIT APPLICATION
Mount Joy Township Zoning Officer
902 Hoffman Home Road
Gettysburg, PA 17325

Permit# _____

APPLICANT'S INFORMATION

Name Brookview Solar I, LLC	Daytime phone: (561) 691-2716	Alternate phone:
Address 700 Universe Blvd., Juno Beach, FL 33408	Email:	
legal owner (property owner)		tenant (application must be accompanied by written permission of property owner)
equitable owner (application must be accompanied by option or agreement of sale)		

PROPERTY OWNER'S INFORMATION

Name See attached Exhibit A	Daytime phone:	Alternate phone:
Address	Email:	

PROPERTY INFORMATION

Parcel# See attached Exhibit A	Address:	Lot size:	Zoning district:
Water: well	public water: _____	Sewer: on-lot	public sewer: _____

DESCRIPTION OF APPLICATION

Type of Application: <input checked="" type="checkbox"/> New Use <input checked="" type="checkbox"/> New Building/Structure Special Exception Change of Use Building/Structure Expansion Conditional Use Variance Appeal from Zoning Officer's Determination Other: _____	Current Use/Building Type: non-residential _____ residential agriculture
	Proposed Use/Building Type: non-residential Solar Energy System residential agriculture
Describe permit or relief sought (including applicable sections of Zoning Ordinance): <u>Solar Energy System permitted by right in AC District, §110-202 (A)(1) - 110 Attachment 1 - Table of Uses</u> _____ _____	Proposed building/structure size: _____ sq. ft. Required setbacks: Front: 30 ft. _____ Rear: 25 ft. _____ Side: 10 ft. _____
Proposed setbacks: Front: _____ Rear: _____ Side: _____	

Does application involve: nonconforming use nonconforming building or structure nonconforming lot	Uniform Construction Code Permit required: <input checked="" type="checkbox"/> Yes No
	Land Development Plan required: Yes No <input checked="" type="checkbox"/>
	Stormwater Management Plan required: <input checked="" type="checkbox"/> Yes No
	Floodplain Development Permit required: Yes No

By signing this application, I declare that:

- I am the title owner of record of the property (landowner), agent of the landowner, or tenant with permission of the landowner, or the holder of an option or contract to purchase the property.
- The information provided in this application is accurate to the best of my knowledge.
- By signing this application, I acknowledge that I am responsible for paying any actual expenses, in excess of the application fee for types of application marked with the (*), that the Township incurs in processing the application, and that such payments are due and payable within 10 business days of the date on the Township's invoice.

APPLICANT IS REQUIRED TO READ AND CHECK THE FOLLOWING

By checking this box, I affirm that I have attached a site plan showing exact size and location of any proposed construction as well as any existing buildings and structures (including dimensions), septic system, well, easements, rights-of-way, property and lot lines, and site dimensions, or other information as is required by the provisions of the Zoning Ordinance to accompany this application.

By checking this box, I hereby grant permission for the Zoning Officer to enter onto my property to conduct compliance inspections while this application is under consideration and any issued Zoning Permit is in effect.

By checking this box, I understand that false information provided on this application may result in a stop work order or revocation of the permit and that false statements herein made also are subject to the penalties of 18 Pa.C.S. §4904, relating to unsworn falsification to authorities.



Signature of Applicant

Date

This application is an important legal document. Township employees will provide general assistance, but cannot provide legal advice. If you have secured legal counsel for this application, please provide the contact information for your attorney below:

Name: Jeremy Frey, Esq.

Address: 100 E. Market St.
York, PA 17401

Telephone No.: (717) 852-4983

Email address: jfrey@barley.com

<p>Date received:</p> <p>Date returned because incomplete application:</p> <p>Date complete application accepted:</p>	<p>Date Zoning Permit issued:</p> <p>Date of Zoning Hearing Board or Board of Supervisors action:</p> <p style="padding-left: 40px;">approval</p> <p style="padding-left: 40px;">approval with conditions</p> <p style="padding-left: 40px;">denial</p> <p>Date Certificate of Zoning Compliance issued:</p>	<p>Fee: \$ _____ Date paid: _____</p> <p>check # _____ cash</p>
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**APPLICATION IN SUPPORT OF BROOKVIEW
SOLAR I, LLC ZONING PERMIT**

Brookview Solar I, LLC (the "Applicant") is a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC. The Applicant has prepared this application (the "Application") for a Zoning Permit for a Solar Energy System in the Agricultural Conservation ("AC") Zoning District. The Applicant currently has a pending Conditional Use application for a Solar Energy System in the Baltimore Pike Corridor ("BPC") as well. The Applicant's Solar Energy System is designed to have a capacity to produce up to 75 megawatts (MW) of electricity ("Project"). This Application is submitted and prepared according to the standards set forth in §110-402(II) of the Township's Zoning Ordinance (the "Ordinance"). The Applicant submits information, exhibits, and materials made part of the Application below in order to comply with the Township's Zoning Permit Application criteria.

Name and Address of Applicant

Brookview Solar, LLC
c/o Anthony Pedroni
National Vice President, Development
NextEra Energy Resources
700 Universe Blvd.
Juno Beach, FL 33408

Name and Address of the landowners of the real estate to be affected

There are ten (10) separate parcels in the AC Zoning District on which the Solar Energy System will be located. The name and address of each of the participating landowner is set forth on Exhibit A attached hereto. The Applicant has agreements with each of the landowners identified on Exhibit A which specifically allow the Applicant to use the properties for a Solar Energy System.

Brief Description and Location of the Real Estate to be Affected by Such Permitted Use

The location of the real estate to be affected is shown on the Site Plan attached hereto as Exhibit B (the "Plan") and includes approximately 735 acres (the "Site").

The site location has been carefully selected with specific evaluation criteria including metrological, topographic, cultural/historic, and environmental data; conformance with local, state, and federal laws; and ability to interconnect into the local transmission grid operated by Met-Ed. The majority of the Project real estate is currently cultivated in annual row crops and minimal tree clearing will be necessary for the panel areas. Vegetative screening will be utilized in accordance with the Township's zoning requirements. Please see Exhibit C for details related to the landscaping plan.

Present zoning classification of the real estate in question

Agricultural Conservation (“AC”).

SPECIFIC ZONING CRITERIA FOR SOLAR ENERGY SYSTEMS

A Solar Energy System must comply with the requirements set forth in Section 402(II) of the Ordinance.

The Application satisfies all the requirements set forth in Section 402(II) of the Ordinance.

a) Site Plan

The Project’s site plan is attached as Exhibit B.

b) Glare Analysis

A glare analysis demonstrating that any glare produced by the Project will not have an adverse impact is attached as Exhibit D.

c) Manufacturer Specifications

The Applicant does not yet have the manufacturer specifications for the Project. They will however be provided at the time of application for a building permit or 30 days prior to site development, whichever occurs first.

The solar panels are a crystalline based product with an anti-reflective coating that are rectangular in shape, and black/dark grey in color. A long row of solar panels is commonly referred to as an “array” and a group of arrays within a fence is often referred to as a “solar field.”

The panels are mounted onto structures (racks) that will “track” or follow the sun as it moves in the sky throughout the day to allow for the most efficient energy production that will align with the power purchase demand profile. The racks are supported by steel posts spaced approximately ten to twenty feet apart. The Project is expected to utilize pile-driven posts inserted into the ground to an approximate depth of six to ten feet below grade; however, depth may vary throughout the site based on soil conditions, local topography, and further geotechnical analysis.

Once mounted, at certain times of the day, the bottom of each solar module will be at between two and three feet above grade, while the top will be up to approximately twelve feet above grade. The maximum height of all the equipment within a given solar field will be 12 feet, and because the panels rotate with the movement of the sun, most of the day the solar panels will be well under this height.

d) Confirmation from public utility

The Applicant will provide confirmation from the public utility to which the system will be interconnected to at the time of application for a building permit or 30 days prior to site development, whichever occurs first in accordance with the requirements of Section 402(II)(d).

e) Solar Easements

There are no solar easements.

(3) Lot Size Requirement

All lots involved in the Project are larger than one acre as required by Section 402(II)(3).

(4) Setback Requirements

The Project shall be no closer than 50 feet to the lot line of an adjacent lot improved with a dwelling. For adjacent lots that do not have dwellings, the setbacks will be 30 feet in front, 25 feet in rear and 10 feet on sides.

(5) Fencing Requirements

The Project shall be enclosed with a minimum 8 foot high fence with a self-locking gate.

(6) Access Drive

As shown on the Site Plan, the Project has access drives meeting the requirements of Chapter 86 and the interior of the system is improved with travel aisles sufficient in location, dimension and construction to allow access by maintenance vehicles and emergency management vehicles.

(7) Lighting

There will be no lighting on the portion of the Project located in the AC Zoning District.

(8) Buffer Depth

The Project will have a 25 feet buffer along public road frontage and any lot line adjacent to a lot improved with a dwelling. The remainder of the Project will have a 15 feet buffer as required under Article VII of the Ordinance.

(9) Fencing

The required fencing is located inside the buffer.

(10) Buffer Planting Requirements

The buffer shall comply with all requirements of Section 402(II)(10)(a)-(k) and Article VII of the Ordinance.

(11) Decommissioning Requirements

The Applicant has enclosed a decommissioning study for its entire project as Exhibit E, including property located in the BPC Zoning District. The Applicant proposes that the area located in the AC Zoning District is covered by performance security for the BPC Zoning District and vice versa.

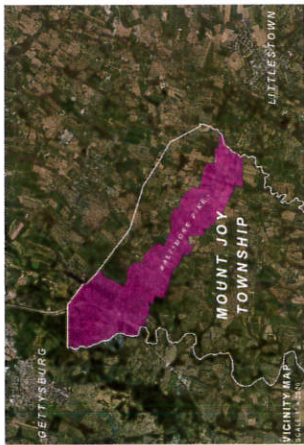
Exhibit A

Landowners

Parcel Number	Parcel ID	Parcel Owner
1	30H16-0050A	Kinsella
2A	30H16-0001A	Basehoar
2B	30H16-0007E	Basehoar
3	30H16-0048	Hilbert
4	30H17-0041	Updyke
5	30H17-0007	Hartlaub
6	30H17-0006A	Shelly
7	30H16-0092	Snyder
8	30H16-0056C	Keller
9	30H16-0094	Frederick/Hoffman

Exhibit B

Site Plan



PROPERTY OWNERS

PARCEL #	PARCEL ID	OWNER	PARCEL #	PARCEL ID	OWNER
10	30116.00077-000	LUCHINI	95	30116.00062-000	WOLFF
11	30116.00078-000	BASEHOR	96	30116.00063-000	WOLFF
12	30116.00079-000	BASEHOR	97	30116.00064-000	HUGHES
13	30116.00080-000	HILBERT	98	30116.00065-000	HARDY
14	30116.00081-000	MARLAMB	99	30116.00066-000	MARLAMB
15	30116.00082-000	SHELLY	100	30116.00067-000	CROUSE
16	30116.00083-000	SMYTER	101	30116.00068-000	MARRISON
17	30116.00084-000	FRECHERK	102	30116.00069-000	REARER
18	30116.00085-000	WICKLINE	103	30116.00070-000	BICKLEY
19	30116.00086-000	SMYTER	104	30116.00071-000	SMYTER
20	30116.00087-000	WOODS	105	30116.00072-000	MARLAMB
21	30116.00088-000	WOODS	106	30116.00073-000	MARLAMB
22	30116.00089-000	WOODS	107	30116.00074-000	WYLES
23	30116.00090-000	WOODS	108	30116.00075-000	MARLAMB
24	30116.00091-000	WOODS	109	30116.00076-000	WYLES
25	30116.00092-000	WOODS	110	30116.00077-000	WOODS
26	30116.00093-000	WOODS	111	30116.00078-000	WOODS
27	30116.00094-000	WOODS	112	30116.00079-000	WOODS
28	30116.00095-000	WOODS	113	30116.00080-000	WOODS
29	30116.00096-000	WOODS	114	30116.00081-000	WOODS
30	30116.00097-000	WOODS	115	30116.00082-000	WOODS
31	30116.00098-000	WOODS	116	30116.00083-000	WOODS
32	30116.00099-000	WOODS	117	30116.00084-000	WOODS
33	30116.00100-000	WOODS	118	30116.00085-000	WOODS
34	30116.00101-000	WOODS	119	30116.00086-000	WOODS
35	30116.00102-000	WOODS	120	30116.00087-000	WOODS
36	30116.00103-000	WOODS	121	30116.00088-000	WOODS
37	30116.00104-000	WOODS	122	30116.00089-000	WOODS
38	30116.00105-000	WOODS	123	30116.00090-000	WOODS
39	30116.00106-000	WOODS	124	30116.00091-000	WOODS
40	30116.00107-000	WOODS	125	30116.00092-000	WOODS
41	30116.00108-000	WOODS	126	30116.00093-000	WOODS
42	30116.00109-000	WOODS	127	30116.00094-000	WOODS
43	30116.00110-000	WOODS	128	30116.00095-000	WOODS

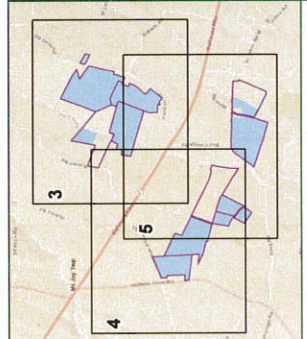
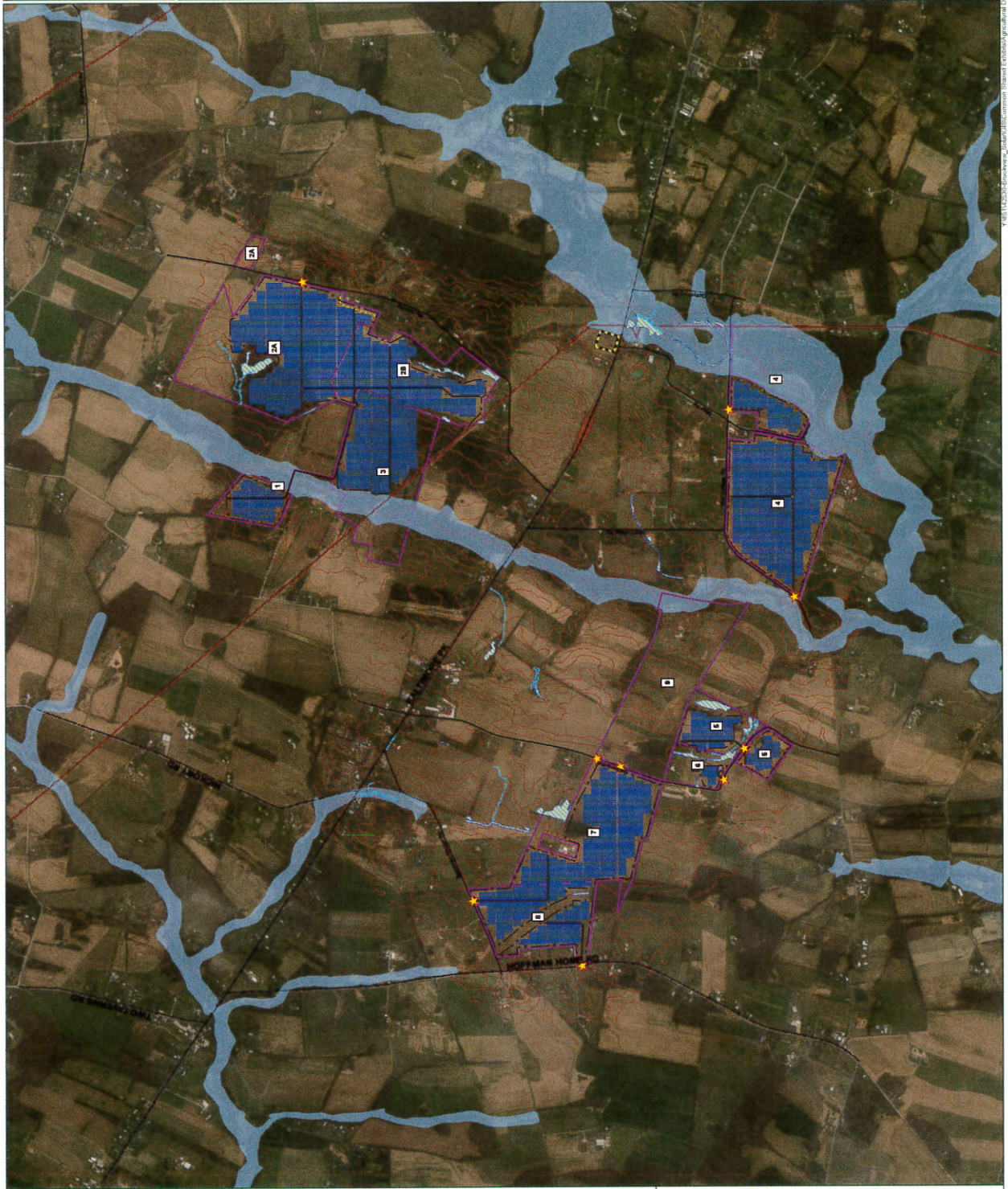
NOTES:
 * SQUARE LABELS REPRESENT AGRICULTURAL ZONED PARCELS
 * SQUARE LABELS REPRESENT PARCELS NOT LOCATED IN MT. JOY TOWNSHIP
 * * SYMBOL LOCATES PROPERTIES WITH HISTORIC BUILDINGS IDENTIFIED BY THE BOARD OF SUPERVISORS



BROOKVIEW SOLAR
 PROPERTY OWNERSHIP

TIMMONS GROUP
 YOUR VISION. ACHIEVED THROUGH Ours.



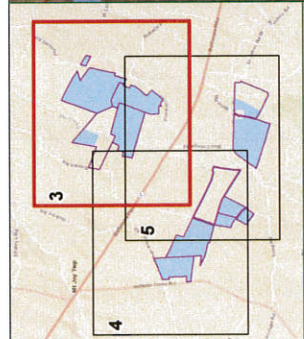


TECHNOLOGICAL SPECIFICATIONS:

- THIS PRELIMINARY SITE PLAN REPRESENTS AN ESTIMATED OUTPUT CAPACITY OF APPROXIMATELY 75 MWAC POWER.
- OUTPUT IS BASED ON 415 WATT PANELS WITH 10% OF THE SITE USING 395 WATT PANELS.
- DIMENSIONS ARE BASED ON THE "EAGLE PERC 72M" MADE BY JIMKO SOLAR, WITH A DISTANCE OF 15.4 LF BETWEEN THE EDGE OF ADJACENT PANELS.

PARCEL #	PARCEL OWNER	PARCEL ID
1	KINSELLA	30H16-0050A-000
2A	BASEHOAR	03116-0001A-000
2B	BOCCABELLA	30H16-0007E-000
3	HILBERT	30H16-0048-000
4	UPDYKE	30H17-0041-000
5	HARTLAUB	30H17-0007-000
6	SHELLY	30H17-0006A-000
7	SNYDER	30H16-0092-000
8	KELLER	30H16-0055C-000
9	FREDERICK	30H16-0094-000

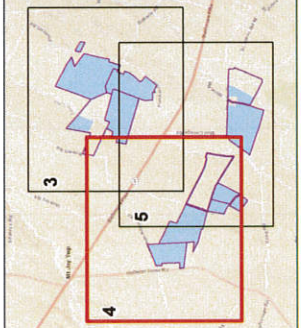
- Legend**
- Project Boundary
 - Property Setbacks (50ft)
 - Property Setbacks (75ft)
 - Fence Line
 - Access Point
 - Substation Location (For Reference Only)
 - Solar Inverter
 - Array Layout
 - Transmission Lines
 - PA State Roads
 - Existing Non-State Roads
 - Delineated Streams
 - Delineated Wetlands
 - Floodplain
 - 5' Contours



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4	UPDYKE	30H17-0041-000
5	HARTLAUB	30H17-0007-000
6	SHELLY	30H17-0006A-000
7	SWYDER	30H16-0092-000
8	KELLER	30H16-0056C-000
9	FREDERICK	30H16-0094-000

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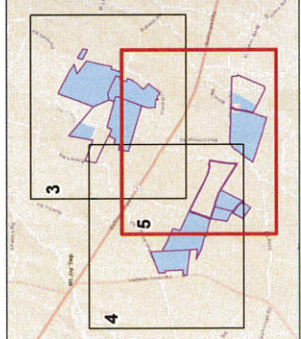


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1	KINSELLA	30H16-0050A-000
2A	BASEHOAR	03I16-0001A-000
2B	BOCCABELLA	30I16-0007E-000
3	HILBERT	30H16-0048--000
4	UPDYKE	30I17-0041--000
5	HARTLAUB	30H17-0007--000
6	SHELLY	30H17-0006A-000
7	SNYDER	30H16-0092--000
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Legend

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1	KINSELLA	30H15-0050A-000
2A	BASEHOAR	03116-0001A-000
2B	BOCCABELLA	30116-0007E-000
3	HILBERT	30H15-0048-000
4	UPDYKE	30117-0041-000
5	HARTLAUB	30H17-0007-000
6	SHELLY	30H17-0006A-000
7	SNYDER	30H15-0092-000
8	KELLER	30H15-0056C-000
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TIMMONS GROUP
 YOUR VISION ACHIEVED THROUGH OURS.
 1001 Broomfield VA 22125
 TEL: 800.208.8028
 www.timmons.com

NEXTEra

BROOKVIEW SOLAR
 MT JOY TOWNSHIP
 ADAMS COUNTY
 PENNSYLVANIA

DATE: 10/26/2020
 TIME: 02:16:20
 PROJECT: BROOKVIEW SOLAR

1. Prepared by:
 2. Checked by:
 3. Approved by:
 (OWNER)

REVISIONS

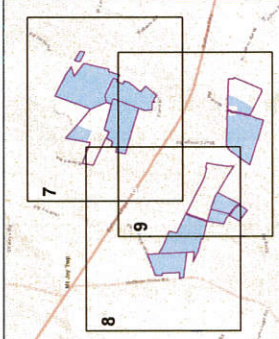
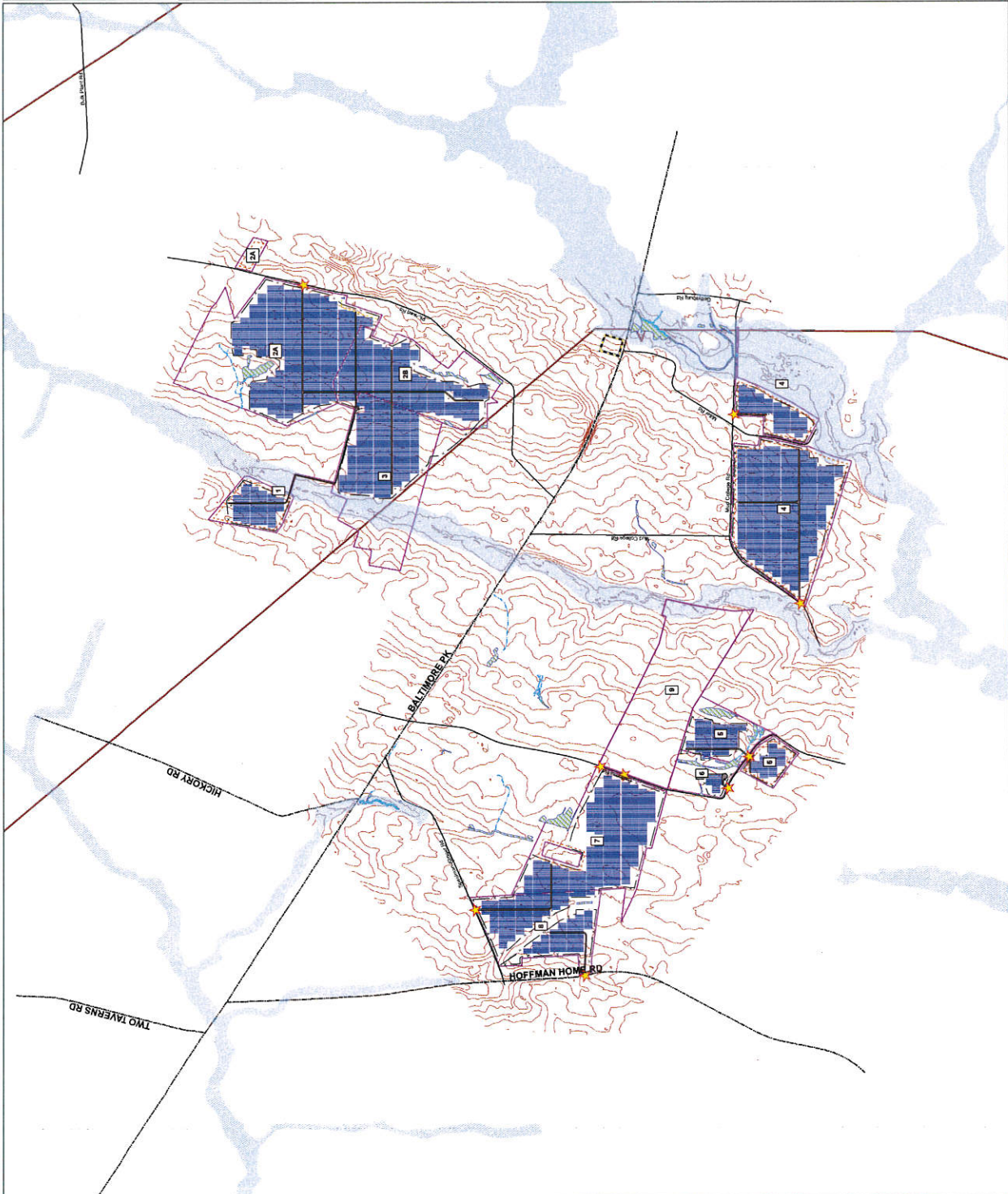
NO.	DESCRIPTION	DATE

PROJECT INFORMATION
 PROJECT NO.:
 SHEET NO.:
 TOTAL SHEETS:

PROJECT LOCATION
 COUNTY: MT JOY TOWNSHIP, ADAMS COUNTY, PA
 TOWNSHIP: MT JOY TOWNSHIP
 PROJECT: BROOKVIEW SOLAR

SCALE (FEET)
 0 200 400 600 800 1,000
 AS SHOWN ON THIS PLAN IS NOT TO SCALE.

6



TECHNOLOGICAL SPECIFICATIONS

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- OUTPUT IS BASED ON 4.5 WATT PANELS WITH 10% OF THE SITE USING 3.9 WATT PANELS.

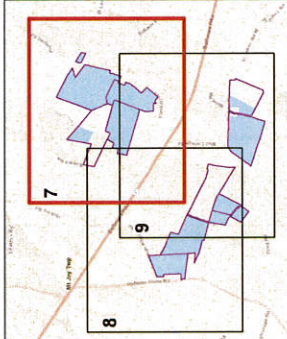
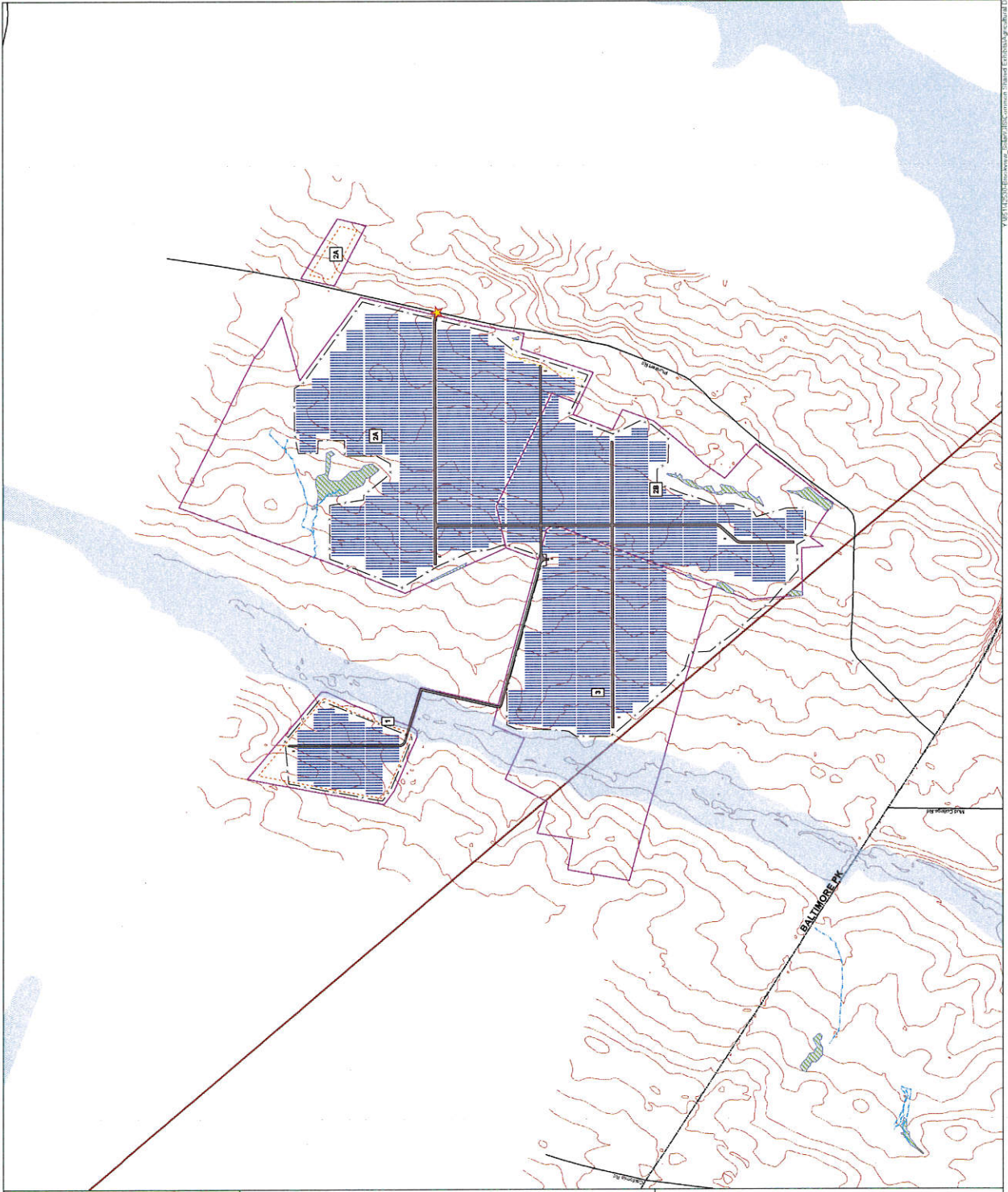
- DIMENSIONS ARE BASED ON THE "EAGLE PERC 7.2M" MADE WITH A PANEL SIZE OF 15.4 LF BETWEEN THE EDGE OF ADJACENT PANELS.

PARCEL #	PARCEL OWNER	PARCEL ID
1	KINSELLA	30H16-0050A-000
2A	BASEFOUR	09H16-0000A-000
2B	BOCCABELLA	30H16-0007E-000
3	HILBERT	30H16-0008-000
4	UPDYKE	30H17-0001-000
5	HARTLAUB	30H17-0007-000
6	SHELLY	30H17-0005A-000
7	SNYDER	30H16-0092-000
8	KELLER	30H16-0056C-000
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Legend

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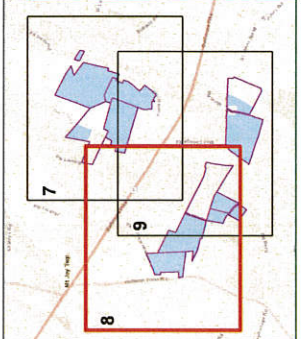
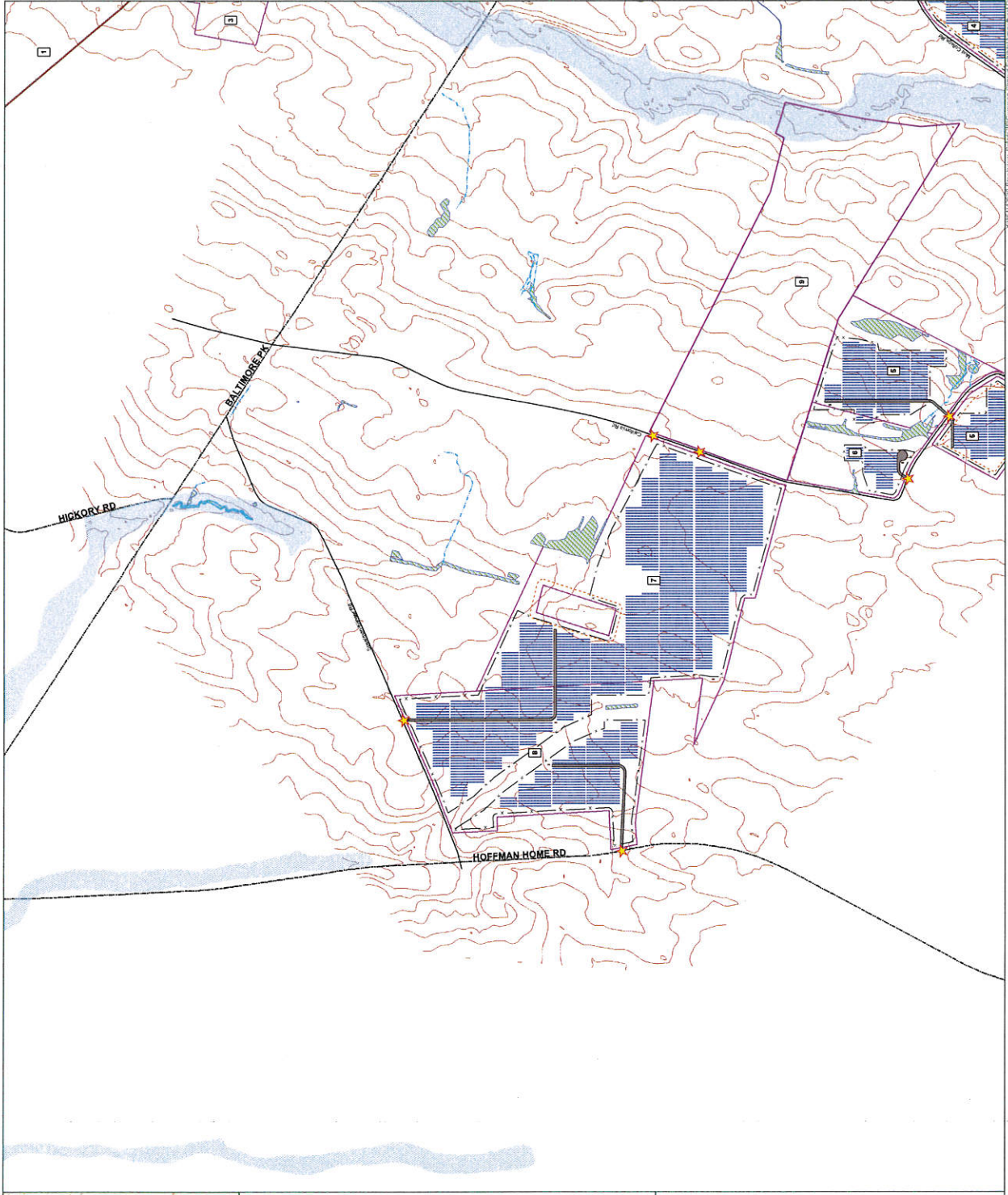
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- Fence Line
- Access Point
- Substation Location (For Reference Only)
- Solar Inverter
- Array Layout
- Transmission Lines
- PA State Roads
- Existing Non-State Roads
- Delineated Streams
- Delineated Wetlands
- Floodplain
- 5 Contours



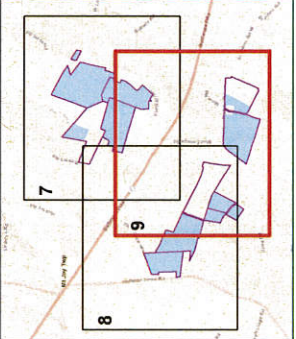
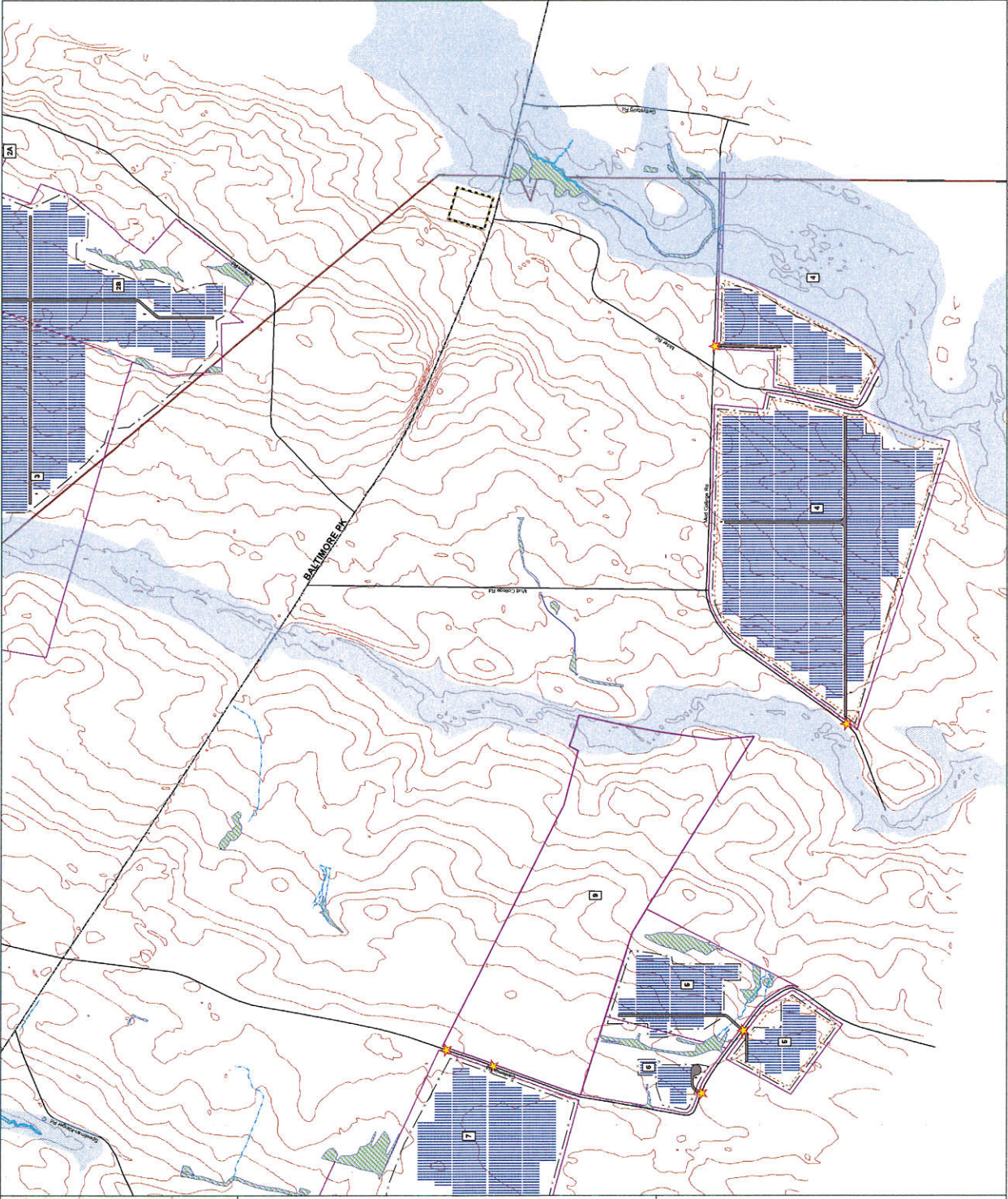
BROOKVIEW SOLAR
 MT JOY TOWNSHIP
 ADAMS COUNTY
 PENNSYLVANIA

DATE: 10/26/2020
 DRAWING NUMBER: 25-30
 PROJECT: BROOKVIEW SOLAR

1. Project limits are approximately as shown.
 2. Topography based on USGS.

REVISIONS	
NO.	DESCRIPTION

PRELIMINARY SITE PLAN



TECHNOLOGICAL SPECIFICATIONS:
 -THIS PRELIMINARY SITE PLAN REPRESENTS AN ASSUMED OUTPUT CAPACITY OF APPROXIMATELY 75 MW AC POWER.
 -OUTPUT IS BASED ON 415 WATT PANELS WITH 10% OF THE SITE USING 395 WATT PANELS.
 -DIMENSIONS ARE BASED ON THE 'EAGLE PERC 73" MADE BY JINKO SOLAR WITH A DISTANCE OF 15.4 LF BETWEEN THE EDGE OF ADJACENT PANELS.

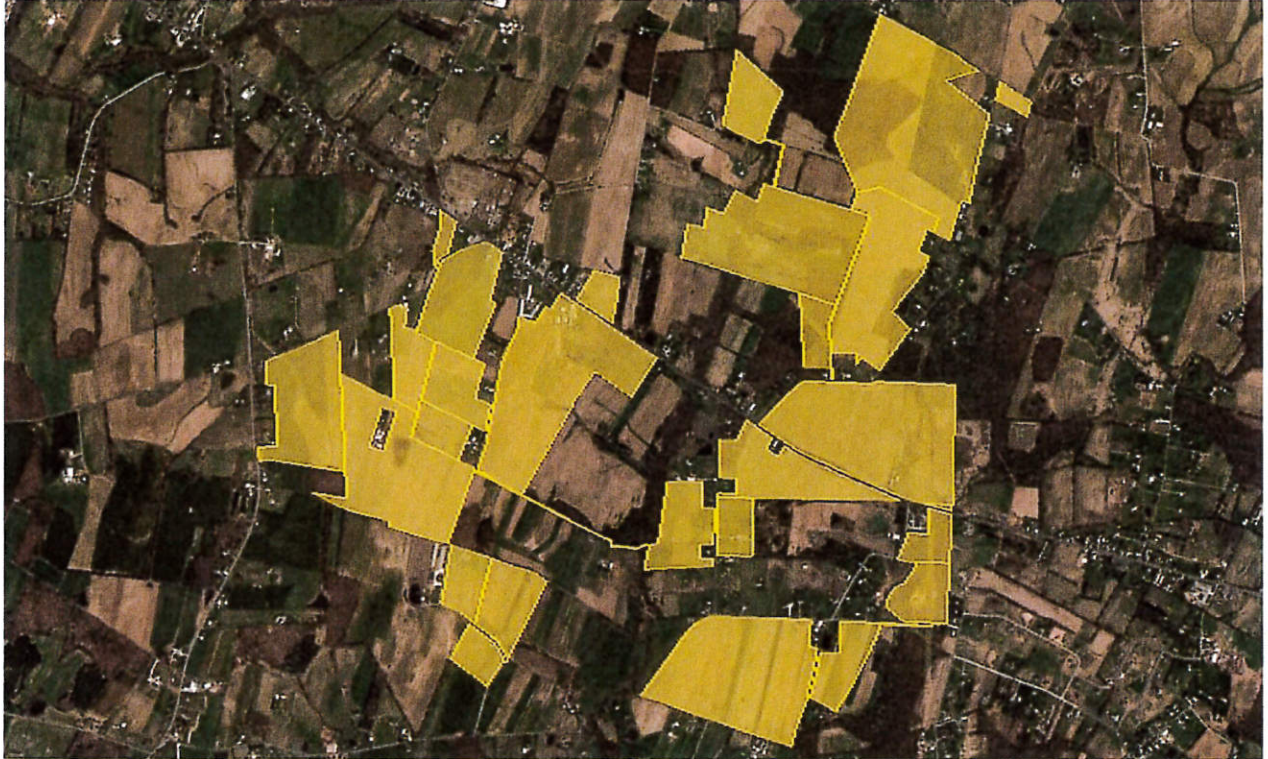
PARCEL #	PARCEL OWNER	PARCEL ID
1	KINSELLA	30H16-0056A-000
2A	BASEHOAR	09116-0001A-000
2B	BOCCABELLA	30H16-0007E-000
3	HILBERT	30H16-0048-000
4	UPDYKE	30H17-0041-000
5	HARTLAUB	30H17-0007-000
6	SHELLY	30H17-0006A-000
7	SWYDER	30H16-0092-000
8	KELLER	30H16-0056C-000
9	FREDERICK	30H16-0094-000

Legend

- Project Boundary
- Property Subbacks (50ft)
- Property Subbacks (75ft)
- Fenceline
- ★ Access Point
- Substation Location (For Reference Only)
- Solar Inverter
- Array Layout
- Transmission Lines
- PA State Roads
- Existing Non-State Roads
- ~ Delineated Streams
- Delineated Wetlands
- Floodplain
- 5' Contours

Exhibit C
Landscape Report

BROOKVIEW SOLAR PROJECT PRELIMINARY LANDSCAPE REPORT



NOVEMBER 2019

PREPARED FOR:

NextEra Energy Resources
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Table of Contents

1.0 Project Overview	1
2.0 Buffer Requirements	1
2.1 Overview	1
2.2 Existing Vegetation	4
2.3 Proposed Buffer A	4
2.4 Proposed Buffer B	7
3.0 Preliminary Cost Estimate	9

1.0 Project Overview

The landscaping requirements for this project consist of buffers that will screen and mitigate the visual impact of the facility along its perimeter by (1) retaining existing trees to the extent possible and (2) planting buffers. The landscaping proposed in this plan will soften the fence line and views of the solar arrays and other infrastructure, as well as beautify some sections of roadway and add ecological benefits with the creation of new wildlife habitat.

This report has been completed based on a review of the Mount Joy Township Zoning Ordinance; memorandums by NextEra Energy Resources, Open Road Renewables, and Barley Snyder Attorneys at Law from Fall 2018; a "Brookview Landscaping Synthesis" dated 12/4/18 (provided by Next Era); and correspondence with Township staff from February 2019. The interpretation and cost estimation included in this report considers both the specific landscaping requirements for Solar Energy Systems in Article IV of the Zoning Ordinance and general requirements for landscaping in Article VII of the Zoning Ordinance. Per Township staff, the "general landscaping sections [Article VII] apply unless the solar section has specific (conflicting) criteria—in which case those specific solar standards apply." The location of each type of buffer determined in this report (existing or proposed) is based on the requirements reviewed alongside the following:

- Project area as shown in the latest KMZ file provided by NextEra Energy titled "PA_Brookview_Final75MW_ProjectBndExtent_LSGIS_20190625"
- Mount Joy Township Zoning Map dated June 5, 2017 (<https://mtjoytp.us/wp-content/uploads/docs/2017-03-Zoning-Map.pdf>)
- Aerial imagery as shown:
 - In Google Earth and dated April 15, 2016
 - In the Adams County Tax Parcel Viewer dated 2018 (https://mapping.adamscounty.us/apps/Public_Parcel_Viewer/)
- Location of public road frontage and dwellings as illustrated in the Solar Receptor Analysis exhibit

2.0 Buffer Requirements

2.1 Overview

Project Area

The Project Area is located in Mount Joy Township, Adams County, Pennsylvania and totals 927.6 acres. The Project Site is situated on the north and south side of the Baltimore Pike (State Route 39), approximately 2.5 miles west of Littlestown. The rural landscape has a mixed land cover of mostly agricultural fields interspersed with some small and large patches of woodlands.

Buffer Treatments

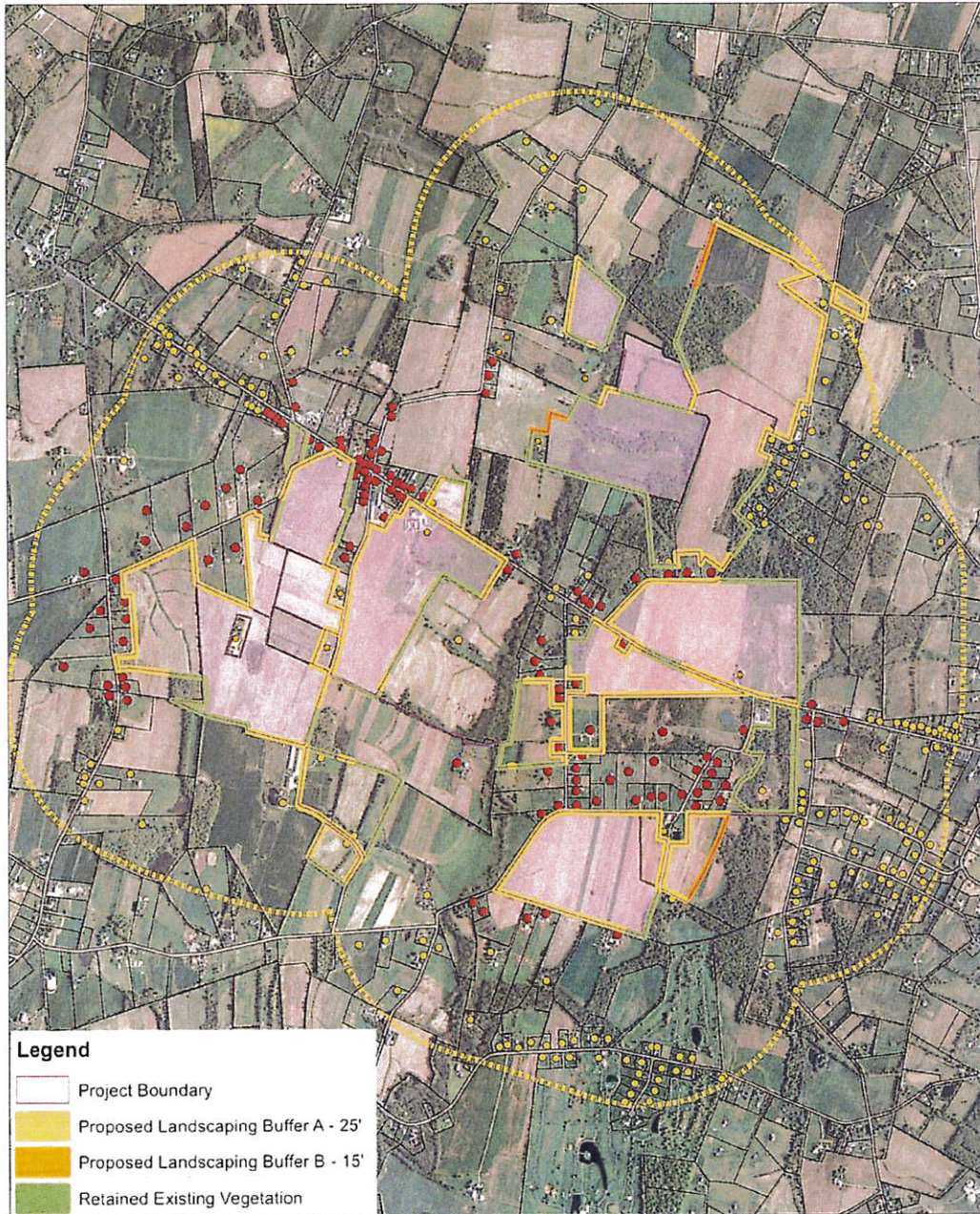
The proposed landscaping consists of buffers totaling 108,944 linear feet (20.63 miles) along the perimeter of the Project Area, including along public road frontage/street right of way and property lot lines. The linear segments of the project area shown in the Preliminary Build Area connecting larger polygonal areas have been excluded from this analysis and assessment.

The three buffer treatments and the proposed length of each type of perimeter treatment are as follows:

- Existing vegetation – 44,241 linear feet: existing buffer within project area boundaries consisting of trees at least size inches in diameter at breast height that meet the purposes of the required buffer/screening
- Buffer A – 61,282 linear feet: 25-ft wide buffer meeting solar energy system landscaping requirements
- Buffer B – 3,421 linear feet: 15-ft wide buffer meeting general landscaping requirements

These treatments have been overlaid on the Brookview Solar Receptor Analysis (dated March 21, 2018) to show their location and placement in relation to parcel boundaries and adjacent and nearby dwellings. Each of these treatments is described and the reasons for their application in the locations indicated are given below.

Buffer Treatments overlaid on Receptor Analysis



Legend

- Project Boundary
- Proposed Landscaping Buffer A - 25'
- Proposed Landscaping Buffer B - 15'
- Retained Existing Vegetation

**Brookview Solar
 Receptor Analysis
 Adams County, PA**

March 21, 2018

- Landowner Participating in Project
- Project Area
- Brookview Half Mile Buffer
- Adams County Parcel Boundaries
- Project Likely Not Visible Without Screening
- Project Likely Visible Without Screening



2.2 Existing Vegetation

Both the specific landscaping requirements for Solar Energy Systems in Article IV and general requirements for landscaping in Article VII of the Zoning Ordinance state that existing trees can be preserved and counted towards the applicable buffer requirements, given that the trees are at least six inches in diameter at breast height and meet the purposes of the required buffer/screening.

For the purposes of this report, the determination for existing vegetation has been made based on the available aerial imagery from 2016. Only vegetation which appears (1) to be within the Project Area and (2) to be sufficient in quantity/linear width to meet the buffer requirements (that would otherwise apply) have been counted. Existing vegetation that is intermittent or that appears to be outside the Project Area has not been counted. An onsite assessment of existing vegetation will enable a more accurate determination of current existing vegetation present within the Project Area. To be used for buffers, this existing vegetation should provide at least the same level of screening as would be provided by a proposed buffer. Individual existing trees standing alone or in a linear segment of intermittent vegetation along public road frontage or lot lines can be credited for plant material and incorporated into a proposed buffer.

The existing vegetation treatment is indicated in green on the map on page 3.

2.3 Proposed Buffer A

The primary proposed buffer treatment is a 25-foot wide buffer that meets landscaping requirements for solar energy systems per Section 110-402.8 of the Zoning Ordinance. Any general landscape requirements that are not addressed under the solar energy system requirements also apply and are addressed here. This buffer is located along the following:

- Public road frontage/street right-of-way
- Property lot lines adjacent to
 - Lots improved with dwellings
 - Unimproved lots in the Baltimore Pike Corridor District (BPC), which is zoned for residential use

This buffer treatment is indicated in yellow on the map on page 3, and the landscaping requirements for the buffer are summarized in the following table and buffer planting template.

Buffer A Landscaping Requirements

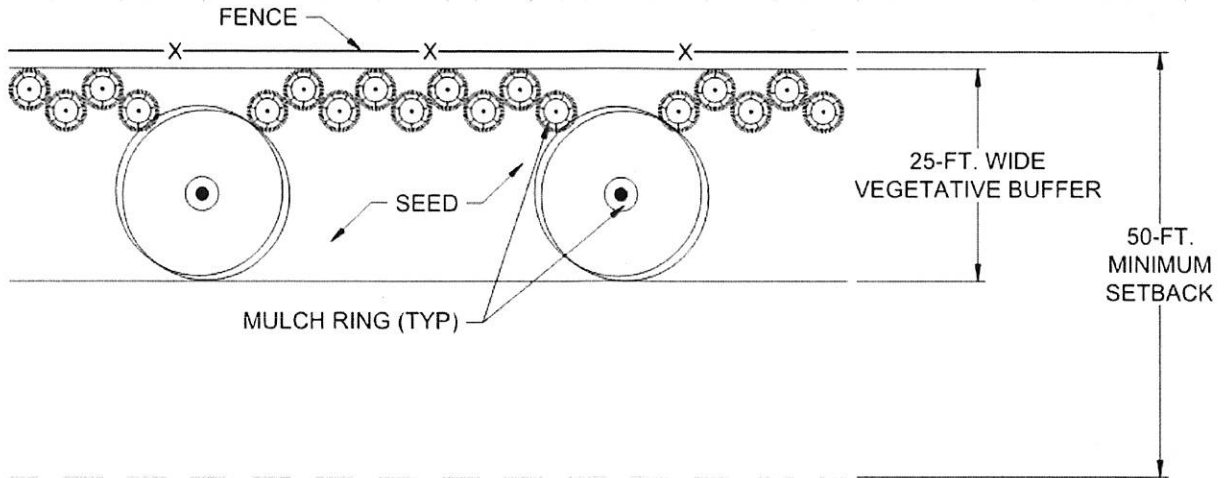
Type of Requirement	Use Requirement	Zoning Ordinance
Minimum Setback distance	50 feet	§110-402 II(4)
Buffer width	25 feet	§110-402 II(8)
Buffer appearance	"Natural-looking visual element." "Mostly solid year-round visual screen at least six feet in height." Deciduous trees spaced to create a naturalistic look.	§110-402 II(10)(a) §110-402 II(10)(c)
Existing vegetation	Trees 6 inches diameter at breast height or greater to be preserved	§110-402(10)(c)
Plant Material		
Plant Type	Quantity per 50 linear feet	§110-402 II(10)(c)
<i>Deciduous shade trees</i>	1	
<i>Evergreen shrubs</i>	No minimum stated ¹	
	Minimum size at planting	§110-402 II(10)(c)
<i>Deciduous shade trees</i>	2-inch caliper	
<i>Evergreen shrubs</i>	36 inches in height	
	Minimum size at maturity	
<i>Deciduous shade trees</i>	Exceeding 20 feet in height ²	§110-708.H(3)
<i>Evergreen shrubs</i>	At least 6 feet in height ⁴	§110-402(10)(c)
Species	Primarily species native to Pennsylvania. No "weak-stem" plants.	§110-402 II(10)

Notes:



1. A sufficient number must be planted in order to create a "mostly solid year-round visual screen."
2. No minimum size at maturity is given in Article IV of the Zoning Ordinance, but this is the height requirement given in the general landscaping requirements in Article VII.
3. No minimum size at maturity is given, but there is a requirement for a "visual screen at least six feet in height" within three years of planting.

Buffer A Planting Template (100-foot segment)

Scale: 1" = 20'



Plant Key

-  DECIDUOUS SHADE TREE
-  EVERGREEN SHRUB

2.4 Proposed Buffer B

The secondary proposed buffer treatment is a 15-foot wide buffer that meets general landscaping requirements. This buffer is located where no solar energy system requirements apply. This includes along property lot lines adjacent to unimproved lots in the Agricultural Conservation District (AC) where the 15-foot buffer applies per Section 110-708.C of the Zoning Ordinance.

This buffer treatment is indicated in orange on the map on page 3, and the landscaping requirements for the buffer are summarized in the following table and buffer planting template.

Buffer B Landscaping Requirements

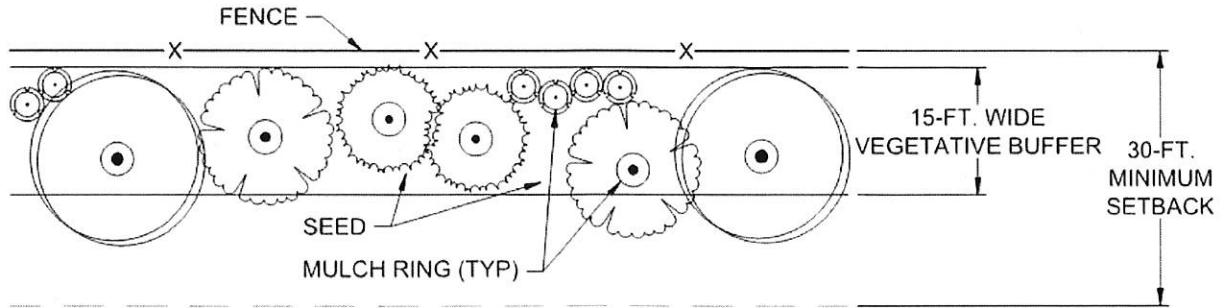
Type of Requirement	Use Requirement	Zoning Ordinance
Minimum Setback distance	Varies, depending on location (front, rear, or side) and zoning district	§110-302.A
Buffer width	15 feet	§110-708.C(2)
Buffer appearance	"Varied by species and distribution to achieve a more natural appearance." "Plantings...distributed...in a naturalistic pattern."	§110-707.B §110-708.H(1)
Existing vegetation	Trees 6 inches diameter at breast height or greater to be preserved	§110-708(H)(7)
Plant Material		
Plant Type	Quantity Per 100 linear feet	§110-708.H(2)
<i>Deciduous trees</i>	4	
<i>Evergreen trees</i>	2	
<i>Shrubs</i>	6	
Plant Type	Minimum size at planting	§110-707.D(1)
<i>Deciduous trees</i>	1-½ to 2-inch caliper	
<i>Evergreen trees</i>	6 feet in height	
<i>Shrubs</i>	24 to 36 inches in height ²	
Plant Type	Minimum size at maturity	§110-708.H(2)
<i>Deciduous trees</i>	Exceeding 20 feet in height	
<i>Evergreen trees</i>	Exceeding 12 feet in height	
<i>Shrubs</i>	3 feet in height	
Species	Primarily species native to Pennsylvania. No "weak-stem" plants.	§110-707.A, §110-708.H(6)

Notes:





1. 24 inches for evergreen shrubs and 36 inches for flowering/deciduous shrubs

Buffer B Planting Template (100-foot segment)

Scale: 1" = 20'



Plant Key

-  DECIDUOUS SHADE TREE
-  DECIDUOUS FLOWERING TREE
-  EVERGREEN TREE
-  SHRUB

3.0 Preliminary Cost Estimate

A preliminary cost estimate for landscaping the project totals \$1,529,925.00. This includes the following:

- Plant material as summarized in the tables and illustrated in the planting templates
- Two-inch thick mulch rings for trees and shrubs
- Seeding needed to cover the areas of the buffer that are not mulched

Planting costs include installation. Mulch or other landscape material such as groundcover is required where there are not trees or shrubs planted per Section 110-708.H(4) of the Zoning Ordinance. Seeding has been included here to account for groundcover outside of mulched areas in the buffer. A 15% contingency has been added to the planting subtotal.

Brookview Solar Facility
Summary of estimated planting costs
Mount Joy Township, PA (Adams County)
October 4, 2019

<u>Buffer A</u>	Quantity	Unit	Unit Cost	Amount
Plants	61,276	LF	\$18.70	\$1,145,973.00
Mulch	581	CY	\$45.00	\$26,145.00
Seeding	33.02	AC	\$2,500.00	\$82,569.00
Planting Subtotal:				\$1,254,687.00
<u>Buffer B</u>	Quantity	Unit	Unit Cost	Amount
Plants	3,421	LF	\$21.00	\$71,841.00
Mulch	25	CY	\$45.00	\$1,128.00
Seeding	1.09	AC	\$2,500.00	\$2,714.00
Planting Subtotal:				\$154,189.00
Combined Planting Subtotal:				\$1,330,370.00
Contingency:	15%			\$199,555.00
TOTAL:				\$1,529,925.00

Exhibit D
Glare Analysis

Brookview Solar Project

NextEra Energy Resources
Adams County, Pennsylvania

Glint & Glare Analysis

October 25, 2019



Capitol Airspace Group
capitolairspace.com
(703) 256-2485

Table of Contents

Summary	1
Methodology	2
Data	3
Results	37
Conclusion	38

Summary

NextEra Energy Resources is proposing to construct solar arrays near Waltz Airport (34PA) and Kingsdale Air Park (PA23), in Adams County, Pennsylvania (*Figure 1*). On behalf of NextEra Energy Resources, Capitol Airspace performed a Glint and Glare Analysis utilizing the Solar Glare Hazard Analysis Tool (SGHAT) in order to identify any potential impacts on Waltz Airport and Kingsdale Air Park operations. Specifically, this analysis considered the impact on aircraft approaching to land on Runways 17/35 at Waltz Airport and Runways 3/21 at Kingsdale Air Park. Since neither airport is a controlled airport, this analysis did not consider the potential for impact on air traffic personnel working in an air traffic control tower (ATCT). Additionally, this analysis considered impact on residents and vehicles.

The results of the study show that there is no predicted glare from the solar array for aircraft making approaches to Runways 17/35 at Waltz Airport and Runways 3/21 at Kingsdale Air Park. These results conform to, and are in accordance with, the FAA's interim policy for *Solar Energy System Projects on Federally Obligated Airports*.

There is no predicted glare for single story or second story residences. There was also no predicted glare from the solar arrays along identified routes for cars and large trucks. Capitol Airspace has applied FAA's glint and glare standards to residences and vehicular operations due to the absence of non-aviation regulatory guidelines.

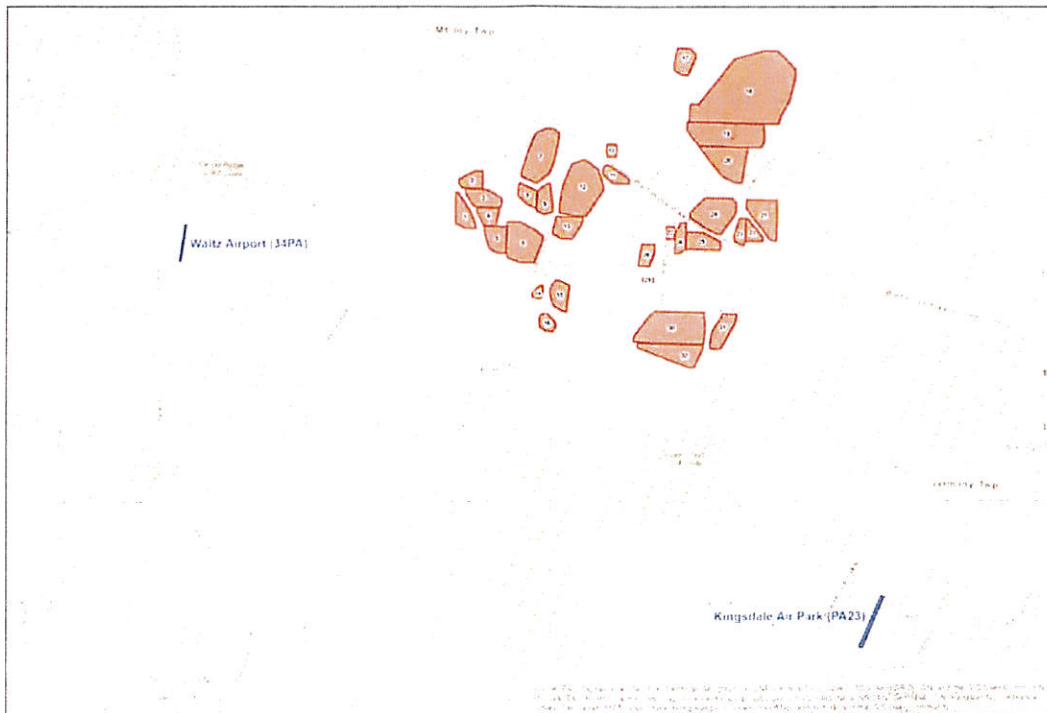


Figure 1: Location of Brookview Solar Project Solar project in Proximity to Local Airports

Methodology

The results of this analysis conform to, and are in accordance with, the FAA's interim policy for *Solar Energy System Projects on Federally Obligated Airports*.¹ The FAA adopted this interim policy in order to enhance safety by providing standards for measuring ocular impact of proposed solar energy systems on pilots and air traffic controllers. In cooperation with the Department of Energy (DOE), the 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 to demonstrate compliance with the standards for measuring ocular impact.

In order for the FAA to approve a revised airport layout plan depicting a solar installation and/or issue a determination of no hazard, the airport sponsor is required to show that the solar installation meets the standards set forth in the interim policy. The interim policy states that a project:

1. Must not have a potential for glint or glare in the existing or planned ATCT cab, (Green, Yellow, or Red) and
2. Must not have a potential for glare (Yellow or Red) 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 (ALP). An airport may have a "low potential for after image" (Green) within these areas. The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.
3. Ocular impact must be analyzed over the entire calendar year in one (1) minute intervals from when the sun rises above the horizon until the sun sets below the horizon.

SGHAT Assumptions:

1. Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
2. Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover, and geographic obstructions.
3. The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values may differ.
4. 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.

Capitol Airspace utilized the SGHAT based guidance provided in User's Manual v.3. Solar array specifications were provided by NextEra Energy Resources. The Brookview Solar Project Arrays are single axis tracking solar arrays. Flight path data was developed by reviewing airport's specific operations before entering it into the SGHAT tool. Each flight path has configurable parameters and observation points. One of the configurable inputs allows for limiting the downward and azimuthal angles of view from the flight path to simulate a pilot's view out the window of the cockpit. NextEra Energy Resources specified that the analysis be conducted from the FAA's approved default settings in the SGHAT tool which utilizes the view from the pilot's perspective.

¹ 78 FR 63176 10/24/2012

Data

Solar Array

NextEra Energy Resources provided the data for the array, based on the input parameters defined in the SGHAT User's Manual v.3.



Figure 2: Overview of Brookview Solar Project Solar project

The data for the Brookview Solar Project Arrays is as follows:

Parameter	Value
Axis tracking:	Single-axis rotation
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 1: Brookview Solar Project Array 1 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.764074	-77.161158	568.3	7	575.3
2	39.763286	-77.160382	568.26	7	575.26
3	39.762499	-77.159685	575.39	7	582.39
4	39.761303	-77.158991	582.48	7	589.48
5	39.760928	-77.158994	582.26	7	589.26
6	39.760933	-77.160035	585.04	7	592.04
7	39.761348	-77.161361	578.29	7	585.29
8	39.762916	-77.161426	574.03	7	581.03
9	39.764075	-77.161416	569.56	7	576.56

Table 2: Brookview Solar Project Array 1 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 3: Brookview Solar Project Array 2 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.765604	-77.160229	567.32	7	574.33
2	39.765974	-77.15913	573.09	7	580.09
3	39.76597	-77.158381	578.26	7	585.26
4	39.765186	-77.15831	576.77	7	583.77
5	39.764435	-77.158316	579.31	7	586.31
6	39.764447	-77.160709	562.4	7	569.4
7	39.764824	-77.161097	561.38	7	568.38
8	39.7652	-77.161093	557.26	7	564.26

Table 4: Brookview Solar Project Array 2 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 5: Brookview Solar Project Array 3 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.7644	-77.157926	579.68	7	586.68
2	39.764019	-77.156911	582.3	7	589.3
3	39.763606	-77.156054	581.15	7	588.15
4	39.763231	-77.156058	583.88	7	590.88
5	39.762856	-77.156139	587.48	7	594.48
6	39.762872	-77.159235	575.87	7	582.87
7	39.763249	-77.159623	570.81	7	577.81
8	39.764037	-77.160321	563.65	7	570.65
9	39.764412	-77.160318	563.01	7	570.01

Table 6: Brookview Solar Project Array 3 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 7: Brookview Solar Project Array 4 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.762751	-77.156375	587.77	7	594.77
2	39.762376	-77.156378	590.44	7	597.44
3	39.761218	-77.156701	590.57	7	597.57
4	39.761226	-77.158133	581.81	7	588.81
5	39.762012	-77.158674	578.87	7	585.88
6	39.762389	-77.158906	577.53	7	584.53
7	39.762764	-77.158902	576.74	7	583.74

Table 8: Brookview Solar Project Array 4 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 9: Brookview Solar Project Array 5 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.761179	-77.155449	586.95	7	593.95
2	39.758828	-77.15547	585.7	7	592.7
3	39.758833	-77.156432	588.48	7	595.48
4	39.759213	-77.157446	592.87	7	599.87
5	39.760817	-77.158058	583.1	7	590.1
6	39.761192	-77.158055	582.25	7	589.25

Table 10: Brookview Solar Project Array 5 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 11: Brookview Solar Project Array 6 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.761579	-77.153803	584.26	7	591.26
2	39.761165	-77.152711	586.77	7	593.77
3	39.760785	-77.151853	589.79	7	596.79
4	39.760373	-77.151153	590.93	7	597.93
5	39.759997	-77.151156	588.81	7	595.81
6	39.758808	-77.151714	587.13	7	594.13
7	39.758026	-77.152112	584.67	7	591.67
8	39.758035	-77.153857	581.11	7	588.12
9	39.758418	-77.155184	583.09	7	590.09
10	39.758827	-77.155415	585.77	7	592.77
11	39.761587	-77.155391	587.91	7	594.91

Table 12: Brookview Solar Project Array 6 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	10.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 13: Brookview Solar Project Array 7 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.769758	-77.151154	566.2	7	573.2
2	39.769753	-77.150191	578.02	7	585.02
3	39.769375	-77.149568	577.47	7	584.47
4	39.768999	-77.149572	578.89	7	585.89
5	39.768012	-77.149815	583.96	7	590.96
6	39.767026	-77.150058	589.26	7	596.26
7	39.766244	-77.150378	590.62	7	597.62
8	39.765869	-77.150616	589.54	7	596.54
9	39.765392	-77.151325	588.74	7	595.74
10	39.764986	-77.151955	586.14	7	593.14
11	39.764988	-77.152213	585.31	7	592.31
12	39.765403	-77.15354	575.77	7	582.77
13	39.765568	-77.153929	573.1	7	580.11
14	39.765943	-77.153926	569.32	7	576.32
15	39.768127	-77.152968	563.64	7	570.64
16	39.768981	-77.152491	562.1	7	569.1
17	39.769388	-77.152174	561.29	7	568.29

Table 14: Brookview Solar Project Array 7 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 15: Brookview Solar Project Array 8 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.764323	-77.152021	586.98	7	593.98
2	39.76354	-77.152028	591.4	7	598.4
3	39.762758	-77.152035	587.57	7	594.57
4	39.762758	-77.152058	587.1	7	594.1
5	39.76311	-77.15314	584.57	7	591.57
6	39.763867	-77.154218	577.64	7	584.64
7	39.764618	-77.154212	573.97	7	580.97
8	39.764979	-77.154064	573.59	7	580.59

Table 16: Brookview Solar Project Array 8 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 17: Brookview Solar Project Array 9 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.764769	-77.151143	586.82	7	593.82
2	39.765027	-77.150756	587.95	7	594.95
3	39.764933	-77.150468	588.59	7	595.59
4	39.763249	-77.150121	592.78	7	599.78
5	39.762498	-77.150127	593.32	7	600.32
6	39.762252	-77.151099	591.79	7	598.79
7	39.762534	-77.151988	587.31	7	594.31
8	39.762909	-77.151985	588.52	7	595.52
9	39.76422	-77.151871	587.25	7	594.25
10	39.764525	-77.151652	585.84	7	592.84

Table 18: Brookview Solar Project Array 9 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 19: Brookview Solar Project Array 10 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.768591	-77.142902	570.04	7	577.04
2	39.76784	-77.142909	568.22	7	575.22
3	39.767432	-77.142991	567.32	7	574.32
4	39.767437	-77.143953	574.7	7	581.7
5	39.767865	-77.144106	577.61	7	584.61
6	39.768597	-77.144099	580.31	7	587.31

Table 20: Brookview Solar Project Array 10 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 21: Brookview Solar Project Array 11 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.76674	-77.143675	570.06	7	577.06
2	39.765947	-77.142038	556.71	7	563.71
3	39.76554	-77.141337	550.19	7	557.19
4	39.765165	-77.141341	549.93	7	556.93
5	39.765176	-77.143321	560.81	7	567.81
6	39.765968	-77.144487	568.99	7	575.99
7	39.766344	-77.144484	576.19	7	583.19
8	39.766743	-77.144246	576.96	7	583.96

Table 22: Brookview Solar Project Array 11 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 23: Brookview Solar Project Array 12 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.767139	-77.146747	590.93	7	597.93
2	39.767138	-77.14641	590.02	7	597.02
3	39.766346	-77.14493	578.74	7	585.74
4	39.764937	-77.144317	564.39	7	571.39
5	39.764561	-77.14432	564.1	7	571.1
6	39.762238	-77.146219	576	7	583
7	39.762244	-77.147416	579.87	7	586.87
8	39.762434	-77.149371	587.65	7	594.65
9	39.763185	-77.149364	590.62	7	597.62
10	39.764751	-77.149037	591.01	7	598.01
11	39.765158	-77.148877	591.01	7	598.01
12	39.766771	-77.148012	591.63	7	598.63

Table 24: Brookview Solar Project Array 12 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 25: Brookview Solar Project Array 13 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.762131	-77.146608	581.26	7	588.26
2	39.761755	-77.146611	577.82	7	584.82
3	39.761381	-77.146849	579.02	7	586.02
4	39.760194	-77.147799	580.14	7	587.14
5	39.760201	-77.149074	583.54	7	590.54
6	39.760615	-77.150088	592.09	7	599.09
7	39.76099	-77.150085	592.59	7	599.59
8	39.762147	-77.149683	591.26	7	598.26

Table 26: Brookview Solar Project Array 13 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 27: Brookview Solar Project Array 14 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.75611	-77.151342	579.49	7	586.49
2	39.756108	-77.151006	577.27	7	584.27
3	39.755732	-77.151009	576.14	7	583.14
4	39.754949	-77.151172	574.01	7	581.01
5	39.754952	-77.151744	578.02	7	585.02
6	39.755057	-77.152212	580.55	7	587.55
7	39.755433	-77.152209	581.33	7	588.33

Table 28: Brookview Solar Project Array 14 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 29: Brookview Solar Project Array 15 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.756597	-77.149585	581.67	7	588.67
2	39.756595	-77.14917	579.75	7	586.75
3	39.75618	-77.147922	563.63	7	570.63
4	39.755805	-77.147925	562.18	7	569.18
5	39.75543	-77.148007	559	7	566
6	39.753863	-77.148255	552.03	7	559.03
7	39.753865	-77.148592	556.5	7	563.51
8	39.754246	-77.149606	569.44	7	576.44
9	39.754656	-77.149993	572.63	7	579.63
10	39.755499	-77.15022	575.62	7	582.62
11	39.755874	-77.150217	576.82	7	583.82

Table 30: Brookview Solar Project Array 15 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 31: Brookview Solar Project Array 16 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.753633	-77.150401	570.86	7	577.86
2	39.752843	-77.149391	562	7	569
3	39.752468	-77.149394	561.52	7	568.52
4	39.752094	-77.149711	565.7	7	572.7
5	39.752099	-77.150673	571.85	7	578.85
6	39.752478	-77.151296	575.13	7	582.13
7	39.752887	-77.15137	573.97	7	580.97
8	39.753262	-77.151367	574.44	7	581.44
9	39.753636	-77.151051	576.59	7	583.59

Table 32: Brookview Solar Project Array 16 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 33: Brookview Solar Project Array 17 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.777104	-77.13463	566.95	7	573.95
2	39.776623	-77.134008	560.95	7	567.95
3	39.776247	-77.134011	561.05	7	568.05
4	39.77516	-77.134569	557.86	7	564.86
5	39.774786	-77.134807	559.37	7	566.37
6	39.77479	-77.135573	561.56	7	568.56
7	39.775171	-77.136508	569.62	7	576.62
8	39.775546	-77.136505	572.49	7	579.49
9	39.776737	-77.136259	576.82	7	583.82
10	39.777112	-77.1361	578.73	7	585.73

Table 34: Brookview Solar Project Array 17 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	10.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 35: Brookview Solar Project Array 18 Inputs

Capitol Airspace Group

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.776996	-77.126465	595.27	7	602.27
2	39.777071	-77.125917	605.12	7	612.12
3	39.777064	-77.124641	609.27	7	616.27
4	39.775896	-77.12293	613.81	7	620.81
5	39.775463	-77.122464	612.32	7	619.32
6	39.774712	-77.122471	609.47	7	616.48
7	39.773064	-77.122953	597.51	7	604.51
8	39.772657	-77.123114	594.96	7	601.96
9	39.77148	-77.123988	595.91	7	602.91
10	39.770676	-77.124308	593.25	7	600.25
11	39.770732	-77.134584	552.1	7	559.1
12	39.771483	-77.134577	556.9	7	563.9
13	39.772266	-77.134492	554.52	7	561.52
14	39.772261	-77.133529	557.54	7	564.54
15	39.776285	-77.129525	578.71	7	585.71

Table 36: Brookview Solar Project Array 18 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 37: Brookview Solar Project Array 19 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.770652	-77.125952	602.44	7	609.44
2	39.76939	-77.125885	598.39	7	605.39
3	39.769014	-77.125889	595.18	7	602.18
4	39.768608	-77.126284	597.95	7	604.95
5	39.768647	-77.133429	559.1	7	566.1
6	39.769058	-77.133895	555.99	7	562.99
7	39.769949	-77.134826	550.52	7	557.52
8	39.7707	-77.134819	550.98	7	557.98

Table 38: Brookview Solar Project Array 19 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 39: Brookview Solar Project Array 20 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.765484	-77.128342	584.11	7	591.11
2	39.765488	-77.129148	590.69	7	597.69
3	39.765904	-77.130402	590.37	7	597.37
4	39.766282	-77.130946	583.58	7	590.59
5	39.76707	-77.1318	568.68	7	575.68
6	39.768647	-77.133429	559.1	7	566.1
7	39.768616	-77.127693	600.48	7	607.48

Table 40: Brookview Solar Project Array 20 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 41: Brookview Solar Project Array 21 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.76405	-77.124285	556.55	7	563.56
2	39.763266	-77.124214	548.4	7	555.4
3	39.761731	-77.124228	536.16	7	543.16
4	39.760506	-77.124239	528.7	7	535.7
5	39.76051	-77.124888	527.62	7	534.62
6	39.76253	-77.126983	562.08	7	569.08
7	39.762908	-77.127371	565.99	7	573
8	39.763318	-77.127758	570.73	7	577.73
9	39.764069	-77.127751	575.24	7	582.24

Table 42: Brookview Solar Project Array 21 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 43: Brookview Solar Project Array 22 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.76241	-77.127493	563.32	7	570.32
2	39.762033	-77.127106	559.44	7	566.45
3	39.760842	-77.125786	533.52	7	540.52
4	39.760467	-77.12579	531.28	7	538.28
5	39.760447	-77.127746	553.88	7	560.88
6	39.762412	-77.127728	565.32	7	572.32

Table 44: Brookview Solar Project Array 22 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	10.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 45: Brookview Solar Project Array 23 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.762412	-77.127728	565.32	7	572.32
2	39.760447	-77.127746	553.88	7	560.88
3	39.760039	-77.127906	550.32	7	557.32
4	39.760041	-77.128165	550.57	7	557.57
5	39.760454	-77.1291	556.46	7	563.46
6	39.76083	-77.129096	561.21	7	568.21
7	39.762416	-77.128534	574.01	7	581.01

Table 46: Brookview Solar Project Array 23 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 47: Brookview Solar Project Array 24 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.76412	-77.129344	587.92	7	594.92
2	39.763709	-77.128878	586.56	7	593.56
3	39.762959	-77.128885	585.16	7	592.16
4	39.762515	-77.129147	583.74	7	590.74
5	39.76097	-77.130625	582.5	7	589.5
6	39.760972	-77.130961	587.45	7	594.45
7	39.761387	-77.132131	577.41	7	584.41
8	39.761767	-77.132989	569.31	7	576.31
9	39.762406	-77.134235	560.25	7	567.25
10	39.762781	-77.134232	562.79	7	569.79
11	39.763359	-77.133522	568.15	7	575.15
12	39.763732	-77.133049	568.82	7	575.82
13	39.764137	-77.13242	572.44	7	579.44

Table 48: Brookview Solar Project Array 24 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 49: Brookview Solar Project Array 25 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.761128	-77.132654	574.36	7	581.36
2	39.760747	-77.13164	579.57	7	586.57
3	39.760333	-77.130627	573.39	7	580.39
4	39.759582	-77.130634	575.85	7	582.85
5	39.759603	-77.13457	554.18	7	561.19
6	39.761138	-77.134556	558.21	7	565.21

Table 50: Brookview Solar Project Array 25 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	10.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 51: Brookview Solar Project Array 26 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.761922	-77.134603	555.89	7	562.89
2	39.759604	-77.134624	554.18	7	561.19
3	39.759199	-77.135332	549.35	7	556.35
4	39.759202	-77.135903	547.25	7	554.25
5	39.759577	-77.1359	548.54	7	555.55
6	39.761145	-77.135808	549.73	7	556.73
7	39.761925	-77.135253	552.92	7	559.92

Table 52: Brookview Solar Project Array 26 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 53: Brookview Solar Project Array 27 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.761585	-77.135983	549.44	7	556.44
2	39.760425	-77.135993	549.77	7	556.77
3	39.76043	-77.136878	544.77	7	551.77
4	39.761589	-77.136867	545.48	7	552.48

Table 54: Brookview Solar Project Array 27 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 55: Brookview Solar Project Array 28 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.759978	-77.138209	540.63	7	547.63
2	39.759227	-77.138216	539.45	7	546.45
3	39.758038	-77.138774	537.32	7	544.32
4	39.758045	-77.14005	539.42	7	546.42
5	39.75842	-77.140046	534.05	7	541.05
6	39.759986	-77.139719	540.82	7	547.82

Table 56: Brookview Solar Project Array 28 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 57: Brookview Solar Project Array 29 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.757059	-77.138279	539.07	7	546.07
2	39.756684	-77.138283	537.43	7	544.43
3	39.75669	-77.139558	532.07	7	539.07
4	39.757066	-77.139555	532.23	7	539.23

Table 58: Brookview Solar Project Array 29 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 59: Brookview Solar Project Array 30 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.754136	-77.132256	541.67	7	548.67
2	39.752943	-77.13211	530.71	7	537.71
3	39.752192	-77.132117	525.86	7	532.86
4	39.751409	-77.132281	524.07	7	531.08
5	39.751453	-77.140468	523.37	7	530.37
6	39.751829	-77.140465	522.5	7	529.5
7	39.752982	-77.139359	529.09	7	536.09
8	39.753762	-77.138648	534.94	7	541.94
9	39.754167	-77.138019	544.89	7	551.89

Table 60: Brookview Solar Project Array 30 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
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 61: Brookview Solar Project Array 31 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.754056	-77.128542	525.27	7	532.27
2	39.75368	-77.128545	524.36	7	531.36
3	39.753272	-77.128676	520.9	7	527.9
4	39.751337	-77.130051	519.37	7	526.37
5	39.750964	-77.130448	520.51	7	527.51
6	39.750968	-77.131332	519.08	7	526.08
7	39.751165	-77.131567	517.83	7	524.83
8	39.751541	-77.131564	518.8	7	525.8
9	39.752503	-77.131318	524.52	7	531.52
10	39.754064	-77.13013	529.6	7	536.6

Table 62: Brookview Solar Project Array 31 Vertices

Parameter	Value
Axis tracking:	Single-axis rotation
Tracking axis orientation:	180.0°
Tracking axis tilt:	0.0°
Max tracking angle:	60.0°
Resting angle:	10.0°
Panel material:	Smooth glass with AR coating
Reflectivity:	Vary with sun
Slope error:	Correlate with material

Table 63: Brookview Solar Project Array 32 Inputs

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground (feet)	Total Elevation
1	39.751304	-77.13236	524.87	7	531.87
2	39.750929	-77.132363	520.73	7	527.73
3	39.749367	-77.133316	516.63	7	523.63
4	39.74937	-77.133887	521.51	7	528.52
5	39.749787	-77.135527	522.62	7	529.62
6	39.75097	-77.139976	526.02	7	533.02
7	39.751345	-77.139972	528.43	7	535.44

Table 64: Brookview Solar Project Array 32 Vertices

Runway 03/21

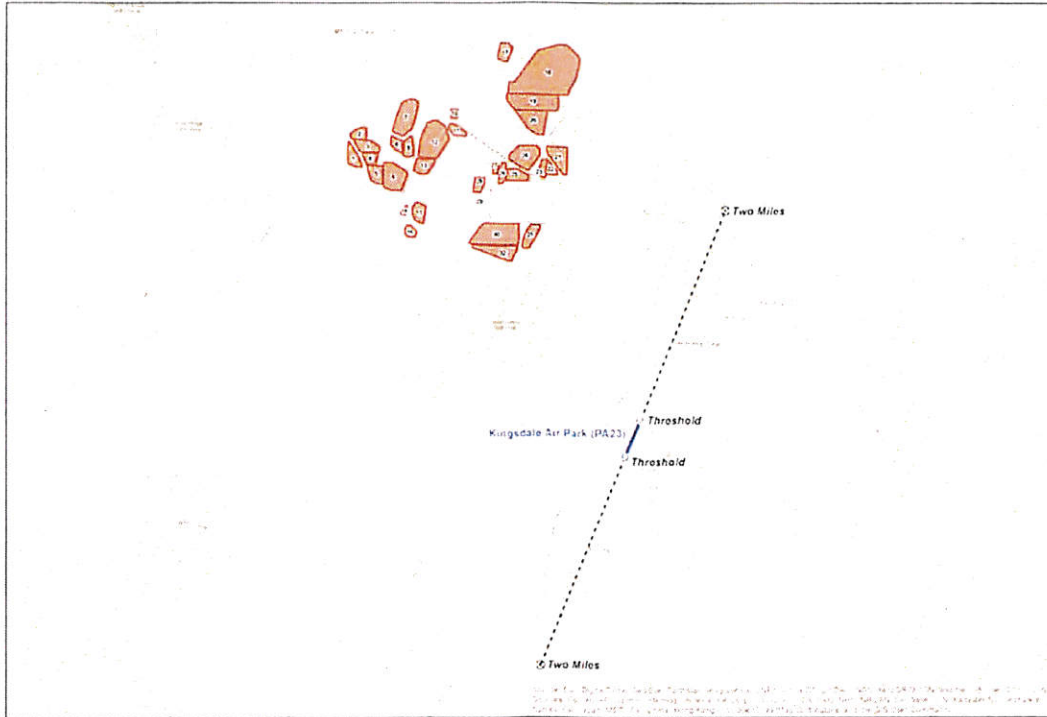


Figure 3: Runway 03/21 SGHAT flight path and Brookview Solar Project Solar project

Parameter	Runway 03	Runway 21
Threshold height (ft)	50.0	50.0
Direction (deg)	21.0	201.0
Glide slope (deg)	3.0	3.0
Consider pilot visibility from cockpit	Yes	Yes

Table 65 Runway 03/21 flight path and viewing parameters

Runway	Observation Point	Latitude	Longitude	Ground Elevation (feet)	Height above ground (feet)	Total Elevation (feet)
03	Threshold	39.729496	-77.11092	585.91	50	635.91
	Two-mile	39.756488	-77.097432	563.82	625.55	1189.37
21	Threshold	39.724933	-77.113329	561.77	50	611.78
	Two-mile	39.69794	-77.126816	531.04	634.19	1165.23

Table 66: Runway 03/21 flight path observation points

Runway 17/35

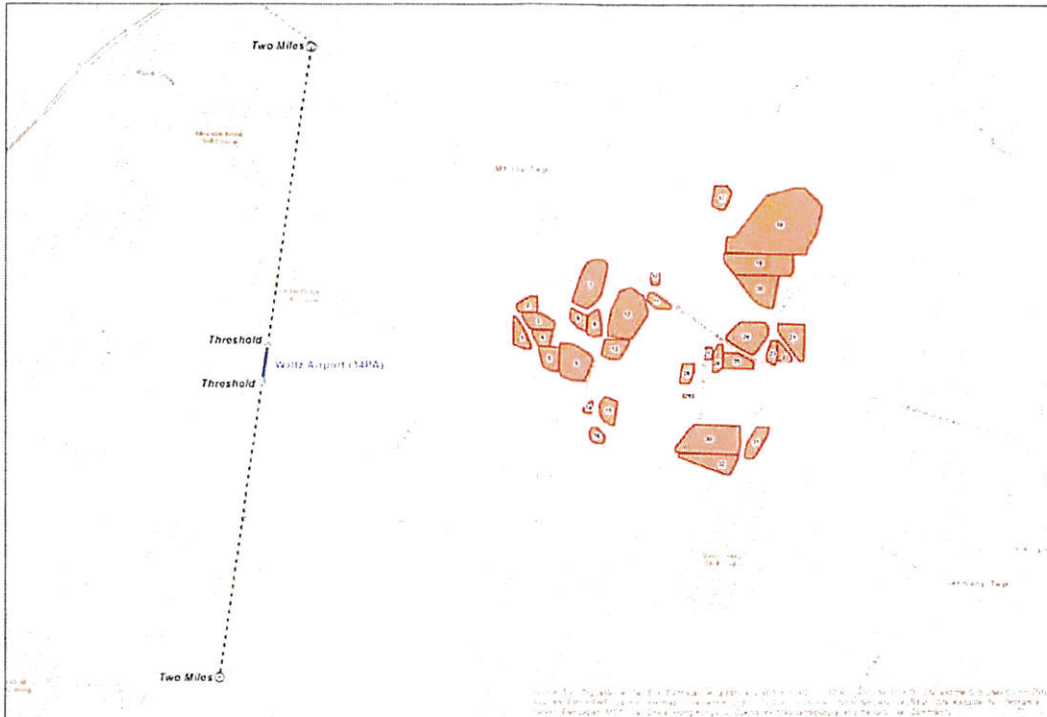


Figure 4: Runway 17/35 SGHAT flight path and Brookview Solar Project Solar project

Parameter	Runway 17	Runway 35
Threshold height (ft)	50.0	50.0
Direction (deg)	187.0	7.0
Glide slope (deg)	3.0	3.0
Consider pilot visibility from cockpit	Yes	Yes

Table 67: Runway 17/35 flight path and viewing parameters

Runway	Observation Point	Latitude	Longitude	Ground Elevation (feet)	Height above ground (feet)	Total Elevation (feet)
17	Threshold	39.760667	-77.192455	526.68	50	576.68
	Two-mile	39.789364	-77.187865	519.29	610.85	1130.14
35	Threshold	39.757462	-77.192998	527.07	50	577.07
	Two-mile	39.728765	-77.197587	517.93	612.6	1130.53

Table 68: Runway 17/35 flight path observation points

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground - Single Story (feet)	Total Elevation - Single Story	Height Above Ground - Second Story (feet)	Total Elevation - Second Story
OP 1	39.76485	-77.162542	564.46	8	572.46	16	580.46
OP 2	39.763848	-77.162051	568.79	8	576.79	16	584.79
OP 3	39.763172	-77.162008	568.86	8	576.86	16	584.86
OP 4	39.762117	-77.162137	570.01	8	578.01	16	586.01
OP 5	39.760266	-77.163158	581.39	8	589.39	16	597.42
OP 6	39.759572	-77.162021	587.35	8	595.35	16	603.35
OP 7	39.758464	-77.162573	593.1	8	601.1	16	609.1
OP 8	39.756043	-77.152549	584.11	8	592.11	16	600.11
OP 9	39.75509	-77.153322	586.66	8	594.66	16	602.66
OP 10	39.750324	-77.157101	563.97	8	571.97	16	579.97
OP 11	39.749356	-77.154352	569.56	8	577.56	16	585.56
OP 12	39.749026	-77.147575	546.12	8	554.12	16	562.12
OP 13	39.748698	-77.144705	521.24	8	529.24	16	537.24
OP 14	39.750551	-77.143219	523.45	8	531.45	16	539.45
OP 15	39.750223	-77.142127	524.75	8	532.75	16	540.75
OP 16	39.756278	-77.143242	550.97	8	558.97	16	566.97
OP 17	39.7544	-77.138604	539.33	8	547.33	16	555.33
OP 18	39.754858	-77.137558	549.18	8	557.18	16	565.18
OP 19	39.755829	-77.134798	552.24	8	560.24	16	568.24
OP 20	39.754941	-77.135481	556.54	8	564.54	16	572.54
OP 21	39.755097	-77.132429	550.59	8	558.59	16	566.59
OP 22	39.760398	-77.138443	542.17	8	550.17	16	558.17
OP 23	39.760996	-77.138877	545.35	8	553.35	16	561.35
OP 24	39.761871	-77.143229	555.41	8	563.41	16	571.41
OP 25	39.766499	-77.160904	571.86	8	579.86	16	587.86
OP 26	39.766961	-77.158522	576.58	8	584.58	16	592.58
OP 27	39.765588	-77.157315	584.06	8	592.06	16	600.06
OP 28	39.766136	-77.155765	580.98	8	588.98	16	596.98
OP 29	39.768053	-77.154354	570.75	8	578.75	16	586.75
OP 30	39.769883	-77.149644	581.26	8	589.26	16	597.26
OP 31	39.770464	-77.150804	567.98	8	575.98	16	583.98
OP 32	39.770698	-77.151419	564.74	8	572.74	16	580.74
OP 33	39.77029	-77.149676	579.14	8	587.14	16	595.14

Table 69: Brookview Solar Project Arrays Discrete Observation Receptors – Set A

Capitol Airspace Group

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground - Single Story (feet)	Total Elevation - Single Story	Height Above Ground - Second Story (feet)	Total Elevation - Second Story
OP 34	39.769405	-77.148588	585.3	8	593.3	16	601.3
OP 35	39.76894	-77.14818	586.29	8	594.29	16	602.29
OP 36	39.768927	-77.147665	588.86	8	596.86	16	604.86
OP 37	39.768226	-77.14839	592.51	8	600.51	16	608.51
OP 38	39.764919	-77.14038	549.79	8	557.79	16	565.79
OP 39	39.765511	-77.140158	555.32	8	563.32	16	571.32
OP 40	39.763885	-77.13808	546.33	8	554.33	16	562.33
OP 41	39.76273	-77.136639	553.6	8	561.6	16	569.6
OP 42	39.763222	-77.135782	556.76	8	564.76	16	572.76
OP 43	39.761519	-77.134003	567.62	8	575.62	16	583.62
OP 44	39.759861	-77.127416	554.34	8	562.34	16	570.34
OP 45	39.758475	-77.12332	532.11	8	540.11	16	548.11
OP 46	39.754745	-77.128474	529.3	8	537.3	16	545.3
OP 47	39.755508	-77.129375	537.95	8	545.95	16	553.95
OP 48	39.756127	-77.133721	557.64	8	565.64	16	573.64
OP 49	39.75642	-77.128624	534.01	8	542.01	16	550.01
OP 50	39.75503	-77.130647	535.82	8	543.82	16	551.82
OP 51	39.757772	-77.131745	567.45	8	575.45	16	583.45
OP 52	39.756205	-77.1383	539.7	8	547.7	16	555.7
OP 53	39.756246	-77.136771	550.63	8	558.63	16	566.63
OP 54	39.757158	-77.13764	545.78	8	553.78	16	561.78
OP 55	39.759458	-77.137546	546.32	8	554.32	16	562.32
OP 56	39.759718	-77.137507	548.11	8	556.11	16	564.11
OP 57	39.759923	-77.13665	551.51	8	559.51	16	567.51
OP 58	39.773099	-77.135779	563.64	8	571.64	16	579.64
OP 59	39.775672	-77.137624	585.62	8	593.62	16	601.62
OP 60	39.780531	-77.127923	585.82	8	593.82	16	601.82
OP 61	39.780558	-77.137503	613.69	8	621.69	16	629.69
OP 62	39.774761	-77.121581	612.9	8	620.9	16	628.9
OP 63	39.768386	-77.14665	592.44	8	600.44	16	608.44
OP 64	39.768015	-77.146216	596.87	8	604.87	16	612.87
OP 65	39.764433	-77.133057	573.99	8	581.99	16	589.99

Table 70: Brookview Solar Project Arrays Discrete Observation Receptors – Set B

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground - Single Story (feet)	Total Elevation - Single Story	Height Above Ground - Second Story (feet)	Total Elevation - Second Story
OP 66	39.764602	-77.131134	595.94	8	603.94	16	611.94
OP 67	39.764617	-77.12879	588.75	8	596.75	16	604.75
OP 68	39.766971	-77.126456	593.73	8	601.73	16	609.73
OP 69	39.768163	-77.125147	590.62	8	598.62	16	606.62
OP 70	39.769322	-77.124536	591.47	8	599.47	16	607.47
OP 71	39.77107	-77.123329	592.42	8	600.42	16	608.42
OP 72	39.772847	-77.12194	605.81	8	613.81	16	621.81
OP 73	39.749958	-77.139575	527.95	8	535.95	16	543.95
OP 74	39.750429	-77.130972	520.4	8	528.4	16	536.4
OP 75	39.761505	-77.150568	598.02	8	606.02	16	614.02
OP 76	39.762667	-77.155695	587.73	8	595.73	16	603.73
OP 77	39.774905	-77.140066	587.73	8	595.73	16	603.73
OP 78	39.779127	-77.141225	598.44	8	606.44	16	614.44
OP 79	39.770296	-77.125185	605.92	8	613.92	16	621.92
OP 80	39.75462	-77.129975	535.99	8	543.99	16	551.99
OP 81	39.749135	-77.134485	537.67	8	545.67	16	553.67
OP 82	39.75693	-77.15112	585.03	8	593.03	16	601.03

Table 71: Brookview Solar Project Arrays Discrete Observation Receptors – Set C

Brookview Solar Project Solar Discrete Observation Points - Routes

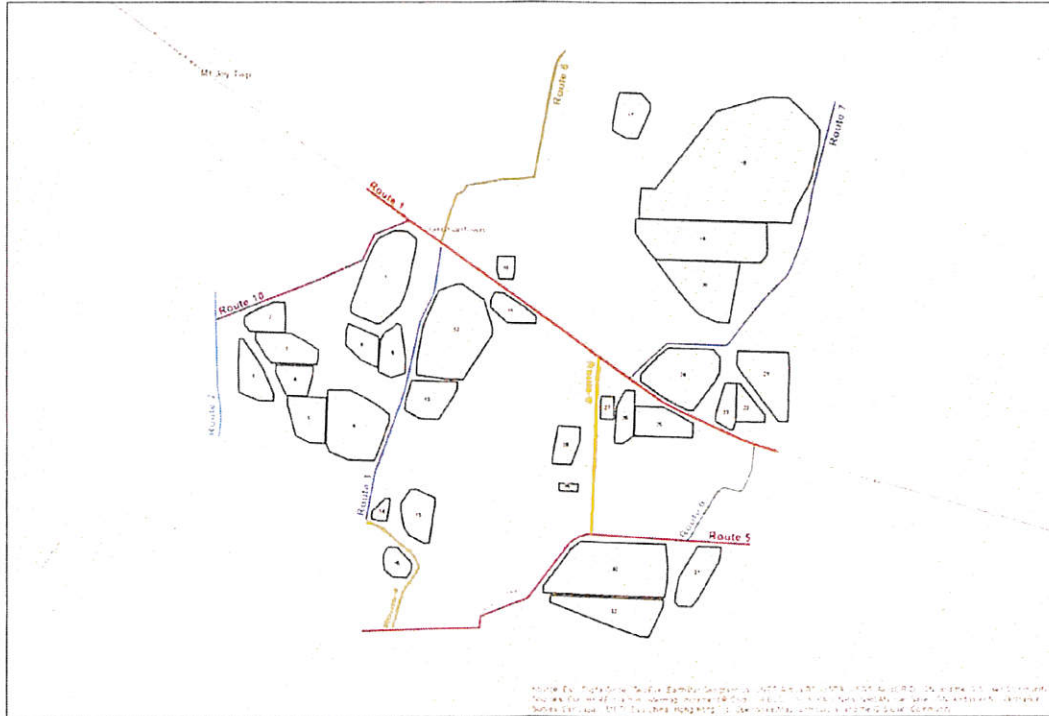


Figure 6: Location of Brookview Solar Project Arrays Discrete Observation Points - Routes

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.771872	-77.153038	546.97	4	550.97	8	554.97
2	39.76905	-77.147585	584.85	4	588.85	8	592.85
3	39.767444	-77.144476	580.6	4	584.6	8	588.6
4	39.765904	-77.141507	553.75	4	557.75	8	561.75
5	39.763785	-77.137422	543.25	4	547.25	8	551.25
6	39.762475	-77.134879	556.23	4	560.23	8	564.23
7	39.761536	-77.133041	563.71	4	567.71	8	571.71
8	39.761139	-77.132085	565.31	4	569.31	8	573.31
9	39.760789	-77.13109	564.13	4	568.13	8	572.13
10	39.760117	-77.129068	554.19	4	558.19	8	562.19
11	39.759777	-77.128051	546.06	4	550.06	8	554.06
12	39.759466	-77.127035	540.03	4	544.03	8	548.03
13	39.759221	-77.126039	529.4	4	533.4	8	537.4
14	39.758997	-77.124908	526.62	4	530.62	8	534.62

Table 72: Brookview Solar Project Arrays Observation Receptors Route 1

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.766499	-77.163128	540.57	4	544.57	8	548.57
2	39.764864	-77.16304	551.62	4	555.62	8	559.62
3	39.761614	-77.162827	565.98	4	569.98	8	573.98
4	39.760705	-77.162618	574.04	4	578.04	8	582.04
5	39.760252	-77.162545	579.85	4	583.85	8	587.85
6	39.759783	-77.162551	584.71	4	588.71	8	592.71
7	39.759051	-77.162647	589.76	4	593.76	8	597.76

Table 73: Brookview Solar Project Arrays Observation Receptors Route 2

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.769009	-77.147901	586.1	4	590.1	8	594.1
2	39.766682	-77.148311	591.91	4	595.91	8	599.91
3	39.766327	-77.148477	593.35	4	597.35	8	601.35
4	39.765181	-77.149185	594.48	4	598.48	8	602.48
5	39.76375	-77.149561	592.11	4	596.11	8	600.11
6	39.761841	-77.150065	594.2	4	598.2	8	602.2
7	39.761189	-77.150325	592.52	4	596.52	8	600.52
8	39.76055	-77.150612	589.98	4	593.98	8	597.98
9	39.757468	-77.152053	584.97	4	588.97	8	592.97
10	39.75501	-77.152586	580.07	4	584.07	8	588.07

Table 74: Brookview Solar Project Arrays Observation Receptors Route 3

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.754912	-77.152519	579.88	4	583.88	8	587.88
2	39.754599	-77.151555	575.06	4	579.06	8	583.06
3	39.753406	-77.149493	560.24	4	564.24	8	568.24
4	39.752994	-77.149116	554.89	4	558.89	8	562.89
5	39.752676	-77.148896	557.31	4	561.31	8	565.31
6	39.752487	-77.148974	556.68	4	560.68	8	564.68
7	39.752123	-77.149297	559.63	4	563.63	8	567.63
8	39.751646	-77.149737	562.92	4	566.92	8	570.92
9	39.751313	-77.149979	560.93	4	564.93	8	568.93
10	39.749415	-77.150663	560.6	4	564.6	8	568.6

Table 75: Brookview Solar Project Arrays Observation Receptors Route 4

Capitol Airspace Group

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.749315	-77.152694	564.65	4	568.65	8	572.65
2	39.749378	-77.15111	563.07	4	567.07	8	571.07
3	39.749622	-77.144753	519.94	4	523.94	8	527.94
4	39.750195	-77.14469	514.66	4	518.66	8	522.66
5	39.750858	-77.142612	519.58	4	523.58	8	527.58
6	39.751155	-77.141496	518.51	4	522.51	8	526.51
7	39.754057	-77.138739	534.43	4	538.43	8	542.43
8	39.754391	-77.138101	539.34	4	543.34	8	547.34
9	39.754544	-77.137457	548.12	4	552.12	8	556.12
10	39.754208	-77.126638	515.09	4	519.09	8	523.09

Table 76: Brookview Solar Project Arrays Observation Receptors Route 5

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.754354	-77.130808	531.61	4	535.61	8	539.61
2	39.755732	-77.129768	537.13	4	541.13	8	545.13
3	39.756421	-77.129232	535.29	4	539.29	8	543.29
4	39.756801	-77.128919	534.06	4	538.06	8	542.06
5	39.756937	-77.128767	533	4	537	8	541
6	39.757053	-77.128605	532.04	4	536.04	8	540.04
7	39.757081	-77.128426	531.38	4	535.38	8	539.38
8	39.757063	-77.128247	529.54	4	533.54	8	537.54
9	39.756996	-77.127889	527.45	4	531.45	8	535.45
10	39.756933	-77.127527	526.27	4	530.27	8	534.27
11	39.756929	-77.127326	527.63	4	531.63	8	535.63
12	39.757017	-77.127167	531.37	4	535.37	8	539.37
13	39.75803	-77.126636	531.74	4	535.74	8	539.74
14	39.759267	-77.126493	532.85	4	536.85	8	540.85

Table 77: Brookview Solar Project Arrays Observation Receptors Route 6

Capitol Airspace Group

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.762588	-77.134934	556.24	4	560.24	8	564.24
2	39.763506	-77.133735	565.46	4	569.46	8	573.46
3	39.764369	-77.132487	571.06	4	575.06	8	579.06
4	39.764322	-77.12862	580.17	4	584.17	8	588.17
5	39.764392	-77.128389	581.85	4	585.85	8	589.85
6	39.765642	-77.127197	585.54	4	589.54	8	593.54
7	39.766839	-77.125929	586.71	4	590.71	8	594.71
8	39.768	-77.124527	576.13	4	580.13	8	584.13
9	39.768288	-77.124312	575.7	4	579.7	8	583.7
10	39.769154	-77.123867	582.29	4	586.29	8	590.29
11	39.769981	-77.123464	587.78	4	591.78	8	595.78
12	39.770841	-77.123207	587.86	4	591.86	8	595.86
13	39.77149	-77.123022	586.75	4	590.75	8	594.75
14	39.77223	-77.122917	591.7	4	595.7	8	599.7
15	39.776939	-77.121496	615.72	4	619.72	8	623.72

Table 78: Brookview Solar Project Arrays Observation Receptors Route 7

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.769287	-77.147899	585	4	589	8	593
2	39.77054	-77.147465	577.6	4	581.6	8	585.6
3	39.77173	-77.146931	580.8	4	584.8	8	588.8
4	39.771835	-77.146505	578.05	4	582.05	8	586.05
5	39.772179	-77.146247	576.42	4	580.42	8	584.42
6	39.772536	-77.143887	580.61	4	584.61	8	588.61
7	39.77256	-77.14279	588.34	4	592.34	8	596.34
8	39.772631	-77.141714	592.05	4	596.05	8	600.05
9	39.777467	-77.140657	603.56	4	607.56	8	611.56
10	39.778633	-77.140346	600.29	4	604.29	8	608.29
11	39.779171	-77.139803	598.93	4	602.93	8	606.93

Table 79: Brookview Solar Project Arrays Observation Receptors Route 8

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.763578	-77.137111	546.18	4	550.18	8	554.18
2	39.754563	-77.137315	549.04	4	553.04	8	557.04

Table 80: Brookview Solar Project Arrays Observation Receptors Route 9

ID	Latitude	Longitude	Ground Elevation (feet)	Height Above Ground – Cars (feet)	Total Elevation - Cars	Height Above Ground – Trucks (feet)	Total Elevation - Trucks
1	39.765023	-77.162937	551.79	4	555.79	8	559.79
2	39.766969	-77.156789	573.02	4	577.02	8	581.02
3	39.768232	-77.153227	559.79	4	563.79	8	567.79
4	39.768885	-77.152854	556.3	4	560.3	8	564.3
5	39.769229	-77.152682	560.32	4	564.32	8	568.32
6	39.769521	-77.152455	560.37	4	564.37	8	568.37
7	39.76993	-77.15128	561.32	4	565.32	8	569.32
8	39.77031	-77.150084	571.06	4	575.06	8	579.06

Table 81: Brookview Solar Project Arrays Observation Receptors Route 10

Results

Capitol Airspace utilized the above specified inputs to analyze potential glint and glare at various points along the flight paths. Runway end coordinates were obtained from the FAA National Flight Data Center (NFDC) National Airspace System Resources (NASR) dataset. SGHAT uses this information to analyze each flight path between a two-mile final and the runway threshold.

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 no glare for any receptor (*Table 82*).

Receptor	Green Glare (minutes / year)	Yellow Glare (minutes / year)	Red Glare (minutes / year)
Runway 17	0	0	0
Runway 35	0	0	0
Runway 3	0	0	0
Runway 21	0	0	0
Residences Single Story	0	0	0
Residences Two Story	0	0	0
Route Cars	0	0	0
Route Trucks	0	0	0

Table 82: Brookview Solar Project Glint and Glare Summary

Conclusion

The SGHAT analyzed the expected total footprints of the arrays for the Brookview Solar Project. The SGHAT findings indicated that no glare is predicted from the project arrays for the approaches to Runways 17/35 at Waltz Airport and Runways 3/21 at Kingsdale Air Park. The findings show that the project is compliant with the FAA interim policy for *Solar Energy System Projects on Federally Obligated Airports*.

There is no predicted glare for residences with an estimated single story viewing height of 8 feet and a second story viewing height of 16 feet. Additionally, there was no predicted glare from the solar arrays along the routes for cars with an estimated viewing height of 4 feet and 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.

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

Exhibit E
Decommissioning Study



Brookview Solar Project Decommissioning Plan

October 21, 2019



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Revision Chart

Rev	Reason for Change	Author	Review		Issue Date
0	Issue Plan	EM	NFB		10/15/19
1					

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Prepared by:



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Table of Contents

Executive Summary	1
1. Introduction and Project Description	2
2. Methodology	2
3. Decommissioning Plan Overview	2
3.1 Decommissioning During Construction (Abandonment of the Project)	3
3.2 Decommissioning After Ceasing Operation	3
4. Decommissioning of the Renewable Energy Generation Facility	3
4.1 Equipment Dismantling and Removal	3
4.1.1 Above-ground Structure Decommissioning	3
4.1.2 Below-ground Structure Decommissioning	4
4.2 Site Restoration	5
4.2.1 Watercourses	5
4.2.2 Agriculture Lands	5
4.3 Managing Excess Materials and Waste	5
5. Decommissioning Costs and Salvage	7
6. Decommissioning Notification	11
7. Decommissioning Bond	11
Appendix I – Project Site Plan	13

Executive Summary

This Decommissioning and Restoration Plan ("Plan") for the Brookview Solar Project ("Project") was prepared by the Timmons Group and Brookview Solar II, LLC ("the Project Owner"). The Plan has been prepared to address the requirements of Code of Ordinances of Mt. Joy Township in Adams County, Pennsylvania and provide for the decommissioning of the Project and restoration of the Project site at the end of the Project's useful life or in the unlikely case of its abandonment. The Plan provides an at the overview of all activities related to the removal of the solar energy system, its equipment and panels, and any appurtenant structures and for restoration of the site to its previous condition as much as reasonably practicable.

A decommissioning bond will be put up by the project owner to begin the decommissioning process when the project has reached the end of its useful life. That bond would be intended to initiate the process in the field at that time. This bond would be intended to hire engineering and other services to determine to specify the decommissioning methods and processes that will be used to return the land to its original use, detail costs involved, and insure public safety throughout the decommissioning process.

A properly maintained solar project has an expected life of twenty five (25) years. It has, however, been assumed that the decommissioning process will commence prior to the termination of the lease with the landowner. The primary reason for the lease to be terminated would be the completion of the project's useful economic life.

During decommissioning all of the Project's facilities will be dismantled and removed. During restoration, the Project site will be returned to its previous condition. If it is agreed upon with the landowner, some or all the Project access roads may be kept in place for the landowner's continued use.

The Project Owner will meet with the landowner prior to the lease expiration date, to review its plans decommission the Project and restore the premises. Solar easements require that the owner decommission the project on the property owner's land. The easement language requires the project owner to begin decommissioning improvements within twelve (12) months of the termination of the lease agreement or termination of the project's use by the owner. All of that is specific to the actual easement agreement signed by the landowner and the project owner.

The decommissioning of the Project and restoration of the site will comply with any applicable municipal, state and federal regulations. As with the construction, a manager responsible for safety will be present on site for the duration of the work.

The Project Owner will ensure that the decommissioning and restoration of the proposed facility is carried out in accordance with Mt. Joy Township's requirements and the measures and practices described in this Plan. This will include but not be limited to:

- Providing notification regarding the plans to continue or cease the operation of the Project,
- Providing a schedule for the start and completion of the decommissioning and

restoration activities,

- Providing site restoration measures that will ensure that the nutrient content of the soil is restored, if necessary, to its prior condition,
- Providing restoration of the site, as practicable, to its pre-construction state as timberland and pastureland, and
- Providing a decommissioning and restoration cost estimate as well as the methods for ensuring that the funds will be available for decommissioning and site restoration.

1. Introduction and Project Description

The Brookview Solar Project is being planned by Brookview, LLC. This Decommissioning and Restoration Plan is being submitted to Mount Joy Township in Adams County, Pennsylvania.

Brookview, LLC proposes to develop this project with a maximum name plate capacity of 75 MW AC as described in the conditional use permit application.

2. Methodology

This Plan provides an overview of all activities during the decommissioning phase of the Project, as well as all activities related to the restoration of the Project site and the management of excess materials and waste.

3. Decommissioning Plan Overview

A properly maintained solar project has an expected life of twenty-five (25) years. This Plan, however, assumes that the decommissioning process will commence prior to the termination of the leases with the landowners. The primary reason for the leases to be terminated would be the completion of the project's useful economic life.

Project Owner will meet with the landowner prior to the lease expiration date to review its plans and schedule for decommissioning the Project and restoring the premises.

During decommissioning all of the Project's facilities will be dismantled and removed, including the perimeter fences, concrete foundations (to a depth of 36 inches below grade), steel piles, mounting racks, trackers, Photovoltaic ("PV") modules, above-ground and underground cables, transformers, inverters, fans, switch boxes, fixtures, combiner boxes and project substation (as identified in Appendix I). All above ground structures including circuit breakers, chain link fencing, main power transformer and control buildings will be removed. All electrical equipment will be removed for reuse or disposal and will carry a significant salvage value. All fill and gravel will be removed and the site will be graded to restore terrain profiles to the extent practicable.

Within twelve (12) months of initiating the decommissioning, Project facilities will be removed from the leased land and restoration will be completed.

3.1 Decommissioning During Construction (Abandonment of the Project)

In the unlikely event that the construction of the project ceases prior to completion, the installed components and all materials on the Project site will be removed and recycled or properly disposed of and the site restored in accordance with applicable regulations and the process described below.

3.2 Decommissioning After Ceasing Operation

In the event that the operation of the solar farm ceases prior to the end of its useful economic life, the installed components will be removed and recycled, and the site restored in accordance with applicable regulations and the procedures described below.

4. Decommissioning of the Renewable Energy Generation Facility

4.1 Equipment Dismantling and Removal

Many of the Project's components are largely composed of recyclable materials, including glass semiconductor material, steel and wiring. When the project reaches the end of its operational life, reusable and recyclable parts will be dismantled, removed from the site and transported to reuse or recycling facilities. All waste resulting from the decommissioning of the facility will be transported by a certified and licensed contractor and taken to a landfill facility.

4.1.1 Above-ground Structure Decommissioning

In the event that the project requires decommissioning, the following sequence for the removal of the components will be used:

Solar Panel Arrays and Project Substation:

- De-energize and disconnect the Project from the utility power grid,
- Disconnect all above ground wirings, cables, fuses and electrical and protection components and reuse or recycle off-site by an approved facility,
- Remove concrete foundations of inverter and transformer pads to a depth of 3 ft below grade,
- Remove PV modules and metallic structures and ship to reuse or recycling facilities for aftermarket use or recycling and material reuse,
- Remove all waste,
- Remove the perimeter fence and recycle off-site by an approved metal recycler, and
- Remove inverters, transformers, meters, fans, lighting fixture and other electrical components and recycle off-site by an approved recycler.

Access Roads:

- Consult with landowner to determine if any access roads should be left in place for their continued use,
- If access road is deemed unnecessary, remove access road and restore access road location as practicable to its previous condition with native soils and seeding,

Project Substation

- De-energize and disconnect the project substation from the utility power grid,
- Disconnect all above ground wirings, cables, fuses and electrical and protection components and recycle off site by an approved recycling facility,
- Remove concrete foundations to a depth of 3 ft,
- Remove main power transformer, switchgear, bus bar support insulator and steel structures and ship to reuse or recycling facilities for aftermarket use or recycling and material reuse,
- Remove all waste,
- Remove the perimeter fence and recycle off-site by an approved metal recycler, and
- Disconnect all electrical equipment.

4.1.2 Below-ground Structure Decommissioning

- Disconnect all underground cables and transmission lines and remove and recycle off-site by an approved recycling facility and
- Remove all PV panel racking below and above ground, including the steel pile foundations.

This Plan is based on current best industry practices and procedures. These practices may be subject to revision based on the development of new and improved decommissioning practices in the future.

4.2 Site Restoration

The Project Owner will develop a comprehensive restoration plan designed to restore the site so it can be returned to its previous use as pasturelands, agriculture use, and timberlands. Restoration will include the following:

- Top soil will be redistributed as necessary to provide essentially the same ground cover as was present prior to the site disturbance.
- Access roads and other areas that become compacted during Project operation will be decompacted to their previous conditions.

Where Project infrastructure has been removed, the project owner will coordinate with the landowner to stabilize any of the disturbed areas. Farmland areas will be left alone for tilling and reuse as such. Erosion and control measures will be installed at ditches and will be left in place until ground cover is fully established.

4.2.1 Watercourses

Within the project location there are no water bodies (i.e., permanent watercourses, intermittent watercourses, seepage areas or lakes). As no water bodies are present and the renewable energy facility does not release emissions which could pollute the air and water bodies, no impact to aquatic environment is expected. As a result, no restoration of water bodies, either during construction or decommissioning is planned.

4.2.2 Agriculture Lands

Once all Project facilities are removed, agricultural and silvicultural lands compacted during project operation (such as access roads) will be decompacted via tilling, plowing or subsoiling and affected areas will be seeded with native grass species.

Similar to the construction phase, soil erosion and sedimentation control measures will be re-implemented during the decommissioning period and until the site is stabilized in order to mitigate erosion and silt/sediment runoff.

Access roads will be left at landowner's requests or graded to restore terrain profiles (to the extent practicable) and vegetated. If removed, filter fabric will be bundled and disposed of in accordance with all applicable regulations. As necessary, these areas will be backfilled and restored to meet existing grade. This material may come from existing long-term berm or stockpile.

The decommissioning of the site will include returning the site to allow the total runoff from the site to be similar to pre-construction conditions.

4.3 Managing Excess Materials and Waste

During the decommissioning phase, waste materials will be removed in accordance with applicable local regulations. This will include but not be limited to obtaining all required permits and doing all soil testing as deemed necessary either by permit or additionally by third party professionals to insure there is no contamination of the site after removal has occurred. It is the goal of the Project Owner to reuse and recycle materials to the extent practicable and to work with local subcontractors and waste firms to segregate material to be recycled. As an example, since the mounting racks are made up of manufactured metal, it is anticipated that nearly 100% of the above grade metal is salvageable based on current industry practices and trends.

Many components of the Project are reusable or recyclable and have salvage value. The Project Owner will manage decommissioning to minimize, to the extent practicable, the volume of project components and materials discarded as waste. Table 4.1 below outlines the anticipated disposition methods of the different project components.

Table 4.1

Anticipated Project Decommissioning Disposition Methods

Component	Disposition Method
Concrete Foundations	Crush and recycle
Solar Panels	Reuse or recycle
Metal racks and mounts	Salvage/recycle
Steel piles and rack foundations	Salvage/recycle
Wiring and cabling	Recycle/salvage
Inverters, transformers, and breakers	Salvage/recycle/reuse
Granular material	Reuse/dispose
Main power transformer	Reuse/sell
High voltage circuit breakers	Reuse/sell
Project Substation steel and switches	Reuse/salvage/recycle
Fence steel	Salvage/recycle
Project Substation Controls	Dispose/reuse

Major pieces of equipment such as transformers and breakers are recyclable and reusable and will have significant market value. The solar panels are expected to retain over 85% of their generation capability after 30 years of operation so their market value as a reusable item is very high. Existing solar panel manufacturer have programs to buy and salvage panels. These programs extract the raw materials in the panels to make new panels at a significant discount from new material costs. Recycled materials include the semiconductor and glass.

Other components such as electrical cable have a high salvage-market value due to

their copper and aluminum content. The same is true for the steel and aluminum racks and foundations that support the solar panels.

As the great majority of the facility will consist of reusable and recyclable items, only a small percentage of the project components and materials will be disposed of in landfills. Any items or materials that are landfilled will be approved prior to disposal. The Project Owner will assume the responsibility for removing this material from the site and properly disposing of it.

5. Decommissioning Costs and Salvage

The following table below lists the estimated decommissioning costs to remove the project components and restore the site to its previous condition.

**Table 5-1 – Detailed Decommissioning Costs
Brookview Solar Project
Detailed Decommissioning Cost Estimate**

Item	Qty	Cost/Unit	Total Cost
370 W Panels	274,320	\$5/unit	\$1,371,600
Steel piles	34,868	\$25/unit	\$871,719
Solar Panel Racks	2,916	\$50/unit	\$145,812
3.2 MW Inverters	30	\$500/unit	\$15,000
3500 KVA Transformers	30	\$3,000/unit	\$90,000
Fence Removal	45,111 Ft.	\$1/ft	\$45,111
Conductor Removal	49,213 Ft.	\$10/ft.	\$492,130
Substation Transformer	1	\$30,000	\$30,000
34.5 kV Circuit Breakers	5	\$7,500	\$37,000
115 kV Circuit Breaker	1	\$7,500	\$5,000
Substation steel	1	\$75,000	\$75,000
Substation Foundations	1	\$50,000	\$50,000
4 MVAR capacitor bank (34.5 kV)	1	\$20,000	\$20,000
Substation Control House*	1	\$10,000	\$10,000
Ops & Maint building*	1	\$10,000	\$10,000

Site Remediation	530 Acres	\$500/acre	\$265,000
Total			\$3,533,372

Project Size: 75 MW ac (96.4 MW dc)
Project land area: Approximately 1,000 acres
Disturbed land area: Approximately 530 acres
*Final project design may not include these facilities

The Project components will have a salvage value at the end of their useful life. Table 5-2 below shows those values based on information known today about the assets.

Table 5-2 Estimated Salvage Value of Project Components

Project Component	Qty	Estimated New Cost/Unit	Estimated New Total Cost	Estimated Salvage Value*
380 W Solar** Panels	274,320	\$0.30/W	\$31,272,480	\$3,127,248
3500 KVA transformers	30	\$50,000	\$1,500,000	\$150,000
Conductor	49,213ft.	\$10/ft	\$492,213	\$50,000
Substation Transformer	1	\$600,000	600,000	\$50,000
35 kV Circuit Breakers	5	\$35,000	\$175,000	\$10,000
115 kV Circuit Breaker	1	\$75,000	\$75,000	\$10,000
4 MVAR cap bank	1	\$100,000	\$100,000	\$7,000
Fence Posts (Gal)	@3560	\$250.00	\$890,000	\$150,00
***Module Racks (Al)	7,309,289 lbs.			\$730,929
***Steel piles	9,136,611lbs			\$913,661
Total Salvage Value				\$5,198,838

*Estimated salvage values are 20% of original cost except where noted.

** Salvage value of these components for after-market use is estimated to be 10% of original cost. After 40 years of use, solar panels are expected to generate electricity at approximately 85% of their original capacity.

*** Used present market scrap price per Capital Scrap Metal schedule 10/15/2019.

The salvage prices are \$0.30/lbs. for aluminum and \$0.27/lbs. for steel.

As noted in Table 5-2, the total estimated decommissioning costs will be **\$3,533,372** and the total estimated salvage value of Project components will be **\$5,198,838**.

The estimated salvage values are derived from years of experience decommissioning and uprating electric substations, overhead transmission and distribution hardware and underground distribution hardware that would include but not be limited to substation and pad mounted transformers, overhead and underground conductors, poles, fencing, ground grid conductors, control housings, circuit breakers (high and medium voltage), protective relaying, and other hardware items. These individual items have high salvage value either as stand-alone components to be reused or recycled and sold as used items. These items also have a relatively high salvage value as pure scrap for steel, copper and other commodities.

6. Decommissioning Notification

At least 30 days prior to commencing decommissioning of the Project and restoration of the site, the Project Owner shall notify Mt. Joy Township of its scheduled start and completion dates of project decommissioning and site restoration.

No later than 12 months after the abandonment or closure of the Project and within 30 days of completing decommissioning and site restoration, the Project Owner shall provide written documentation acceptable to the Township demonstrating that the Project has been decommissioned, that the Project site has been restored and that the solar panels and related equipment were properly disposed of in accordance with local, state and federal regulation.

7. Decommissioning Bond

To ensure that funds will be available for decommissioning the Project and restoring the site to its condition prior to construction, the Project Owner shall provide a bond in the form of cash or surety from a bonding company qualified to transact business in the State of Pennsylvania and acceptable to Mt. Joy Township. The amount of the bond has to be reasonably sufficient to cover removal of the solar farm in its entirety and restoration of the site.

For the Project, the estimated amount required to decommission and restore the Project site, as outlined in Table 5-1 above, is \$3,533,372. The estimated salvage value of the Project components, as outlined in Table 5.2, is \$5,198,838. Because the estimated salvage value is more than the estimated decommissioning and restoration costs, the decommissioning and restoration of the Project is expected to net approximately an additional \$1,665,466 to complete the decommissioning.

Initiating the decommissioning and restoration of the Project is expected to require engineering services to identify and select a decommissioning/restoration contractor and legal services to review contracting documents and ensure regulatory requirements are met. It is estimated that the cost of these services will not exceed

\$30,000.

Once, a decommissioning and restoration contractor is selected and notice to proceed is issued, the salvage of project components will provide cash flow and revenue to pay for the decommissioning and restoration costs. Since up to \$20,000 will be required to initiate the decommissioning/restoration and the remaining costs will be covered by revenue from the salvage of project components, the amount of the bond required to be posted by the Project Owner at the time of Solar Farm Permit Application is \$30,000.

The bond shall be maintained as long as the solar farm exists, regardless of whether it is actively operating. The bond shall be released or returned when the county's code enforcement department determines in its reasonable discretion that the decommissioning and restoration of the Project site has been completed in accordance with all applicable ordinances and federal and state laws. Alternatively, the bond shall be released or returned if the project is cancelled prior to construction commencing.