BEFORE THE SERGEANT TOWNSHIP BOARD OF SUPERVISORS

RWE Solar Development, LLC

SOLAR SYSTEM PERMIT APPLICATION & NARRATIVE

BEFORE THE SERGEANT TOWNSHIP BOARD OF SUPERVISORS

In Re: RWE Solar Development, LLC)
Principal Solar Energy System)
)

PROJECT NARRATIVE

1. RWE Solar Development, LLC ("RWE") submits the within application ("Application") to the Sergeant Township Board of Supervisors seeking approval for the development of a solar energy facility ("Solar Facility") to be located in the Township on properties owned by John Hancock Life Insurance Company (U.S.A.), and its advisor, Manulife Investment Timberland and Agriculture Inc, and identified as Tax Parcel Nos. 29-002-100; 29-001-104; 29-003-100; and 29-002-300 ("Subject Property"). *See* Ex. 1.

2. The Solar Facility is considered a "Principal Solar Energy System" use pursuant to Sergeant Township Ordinance No. 27 ("Solar Ordinance").

3. The owners of the Subject Property have entered into an agreement to lease or sell the Subject Property to RWE for the purpose of developing the Solar Facility. *See* Ex. 2.

The Proposed Solar Facility

4. RWE is proposing to construct the Solar Facility on approximately ±3,515 acres of property located within Sergeant, Hamlin and Norwich Townships (±2,965 acres are located in Seargeant Township; ±133 acres are located in Hamlin Township, and ±417 acres are located in Norwich Township). The within application seeks approval for the portion of the Solar Facility located within the Township. *See* Ex. 1.

5. The proposed Solar Facility is a ±480 MWac electric generation facility that will consist of a collection of ground-mounted solar panel arrays, substations, battery energy

storage system (BESS), operations and maintenance building, access roads, other associated ancillary racking and equipment, inverters and electrical infrastructure and transmission lines that will utilize photovoltaic technology to convert solar energy into electricity and deliver it into the power grid via the existing Stolle Road to Homer City Station 345 kV transmission line.

6. In the Township, the proposed Solar Facility will largely consist of solar panels, BESS, and substation. Inverters will be located centrally to the Subject Property, within the fence line and vegetative buffer, which will shield them from view.

7. The Solar Facility is a passive, low-impact use. RWE will maintain the Subject Property in a "managed turf" or "open meadow" setting post-construction. The Solar Energy Facility will not have meaningful post-construction increase in traffic.

8. The Solar Facility will provide a myriad of benefits to the to the Township, County, and surrounding neighborhood, including: (1) increased tax revenue; (2) the creation of construction jobs; (3) minimal operational impact on local Township or County services; (4) the creation of electricity generated with no combustion and no emissions; (5) limited water use during operations; (6) no excess noise, traffic, or other disturbances during operation; and (7) after decommissioning of the Solar Facility at the end of its operational life, the Subject Property can be restored to another productive use.

9. In the Solar Facility's first year of operation, it is estimated that it will produce approximately 908,639 megawatt-hours (MWhs) of clean, renewable electricity, which is equivalent to the amount of energy needed to power over 77,000 average U.S. homes. *See* Ex. 7.

10. It is anticipated that the proposed Solar Facility will provide more than 1,000 jobs during the 18 to 24-month construction phase, with a significant portion expected to

come from qualified McKean County labor resources. The Solar Facility will also create or support approximately 20 permanent, full-time jobs during the operational phase. *See* Ex. 8.

11. In addition to significant job creation, once the Solar Facility is operational, it will generate a sizeable amount of new property tax and other revenues, including: approximately $12.3 million to the Township over the lifetime of the project.

The Proposed Solar Facility's Compliance With The Solar Ordinance

12. A site plan with all of the required information in the Solar Ordinance has been submitted with the Application. *See* Ex. 1; Solar Ordinance § 4.1.a.

13. Although not required, RWE prepared a Stormwater Management Report that provided details on how the proposed stormwater management design will be utilized to achieve compliance with the standard design criteria from 25 Pa. Code Chapter 102.8(g)(2) and (3). *See* Ex. 3; Solar Ordinance § 4.1.a.

14. The Solar Facility shall comply with all applicable Federal, State and local regulations and have permits required by any governmental regulatory agency with jurisdiction over any aspect of the development. Such requirements shall include, but shall not be limited to, Soil Erosion and Sedimentation Plans, and NPDES Plans. No construction may commence without required permits and approvals and except in accord with all such permits and approvals. RWE shall provide the Township with copies of all required state regulatory permits prior to construction.

15. RWE will utilize solar panels that are designed to maximize the absorption of sunlight and limit the reflectivity of sunlight. The solar panels will be coated with anti-reflective material to minimize the potential for concentrated reflection and glint/glare. RWE has

submitted a Solar Glare and Glint Analysis Report, which concluded that the Solar Facility will not generate any glare. *See* Ex. 4; Solar Ordinance § 4.1.b.

16. Preliminary manufacturer specifications for the key components of the Solar Energy System have been provided with the within application. *See* Ex. 4. To the extent the components change, RWE shall provide the Township with updated specifications at the time of application for a building or electric permit. *See* Solar Ordinance § 4.1.c.

17. RWE shall provide the Township with written confirmation concerning the approval of the interconnection for the Solar Energy Facility at the time of application for a building or electric permit. *See* Solar Ordinance § 4.1.d.

18. The Pennsylvania Department of Environmental Protection ("DEP") does not have an approved solar installer list. However, RWE confirms that the installer will be certified and registered to perform this work within Pennsylvania. The installer has not been selected at this time. Prior to construction, RWE will provide this information to the Township. *See* Solar Ordinance § 4.1.e.

19. There are no existing or intended solar easements associated with the proposed Solar Energy Facility. *See* Solar Ordinance § 4.1.f.

20. The proposed Solar Facility is more than two (2) acres. *See* Ex. 1; Solar Ordinance § 4.2.

21. The proposed Solar Facility is setback at least fifty (50) feet from the lot line of all adjacent properties. *See* Ex. 1; Solar Ordinance § 4.3.

22. Gated access roads will be located throughout the Subject Property for construction and maintenance of the Solar Facility. The Solar Facility will have an 8ft ag-style fence surrounding the site, as well as an 8-foot-tall fence with barbed wire securing the proposed

substation. All fencing will follow the standards of the National Electric Code (NEC), and all fences and access gates will contain appropriate warning signage that will be clearly visible around the site. *See* Ex. 1; Solar Ordinance § 4.4.

23. Multiple 16' wide access roads will be provided off of Bloomster Hollow Rd. Within the site, cartways shall be provided to an inverter or transformer location to allow reasonable access for emergency response vehicles including emergency medical service and fire fighting vehicles and apparatus as well as direct access to an inverter or transformer location. *See* Ex. 1; Solar Ordinance § 4.5.

24. The Solar Facility will only include lighting for security and safety purposes. The lights will utilize motion sensors and will not be illuminated when not needed. The main access gate to the Subject Property will be illuminated at night but will be downcast and shielded to minimize disturbance. *See* Ex. 1; Solar Ordinance § 4.6.

25. A majority of the site will be entirely screened from view with existing tree cover. In areas without existing tree cover that maintain a line of sight from nearby dwelling or roadway, RWE will install a new vegetative buffer that is no less than twenty-five (25) feet and depth and complies with the requirements of the Solar Ordinance to the extent necessary. *See* Ex. 1; Solar Ordinance §§ 4.7 & 9.

26. The required perimeter fence shall be placed on the inside of the required buffer. *See* Ex. 1; Solar Ordinance § 4.8.

27. On-site transmission lines shall be placed underground to the maximum extent feasible. *See* Solar Ordinance § 4.10.

28. The layout, design, installation, and ongoing maintenance of the Solar Facility shall conform to applicable industry standards, such as those of the American National

Standards Institute (ANSI), Underwriters Laboratories (UL), the American Society for Testing and Materials (ASTM), Institute of Electrical and Electronics Engineers (IEEE), and recognized Solar Rating and Standards organizations, and shall comply with the Pennsylvania Uniform. Construction. Code as applicable, and with all other applicable fire and life safety requirements. *See* Solar Ordinance § 4.11.

31. The solar energy system shall at all times be maintained and kept in good working order and repair. *See* Solar Ordinance § 4.12.

32. RWE will post in a prominent location current information identifying the person to contact with inquiries or complaints and shall provide this information to the Township Secretary. *See* Solar Ordinance § 4.13.

33. RWE plans to decommission the Solar Facility at the end of its productive life and will post a removal bond in accordance with Section 5 of the Solar Ordinance. *See* Ex. 6; Solar Ordinance § 5.

34. RWE shall provide a copy of the project summary and the site plan to local emergency services. RWE shall cooperate with emergency services to develop and coordinate implementation of an emergency response plan for the Solar Facility and provide training if so requested. *See* Solar Ordinance § 4.10.

35. Because the proposed Solar Facility complies with all of the requirements of the Solar Ordinance, RWE requests that the Supervisors grant the Application and issue a Solar System Permit.

Respectfully submitted,

By: 

Shawn N. Gallagher

Buchanan Ingersoll & Rooney, P.C.
Union Trust Building, Suite 200
501 Grant Street
Pittsburgh, PA 15219
(412) 562-8362
Counsel for RWE Solar Energy, LLC

4899-4793-9723, v. 1

Sergeant Township Exhibit List

Ex. 1 Solar Energy System Site Plan

Ex. 2 Memorandum of Lease Agreement

Ex. 3 Stormwater Management Report w/o Appendices & PCSM Plan

Ex. 4 Solar Glare and Glint Analysis Report

Ex. 5 Manufacturer Specifications

Ex. 6 Decommissioning Plan

Ex. 7 Supplemental Information

Exhibit 1

SOLAR SYSTEM PERMIT PLANS

FOR

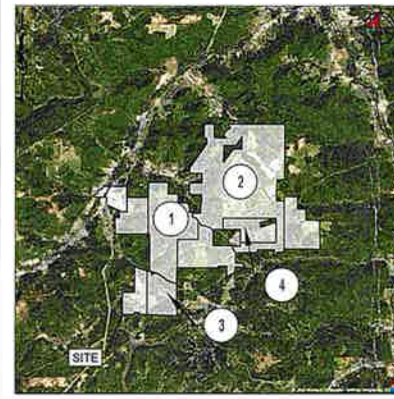
STARGAZER SOLAR

RWE SOLAR DEVELOPMENT, LLC

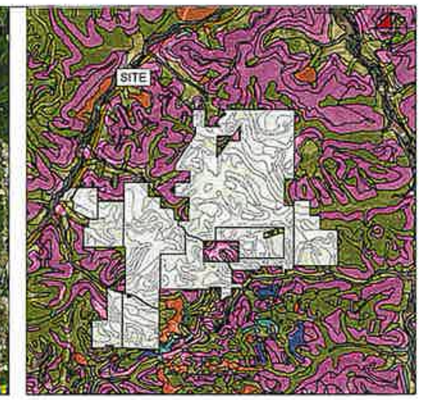
SERGEANT TOWNSHIP, MCKEAN COUNTY, PA

Sheet List Table

Sheet Number	Sheet Title
G-000	COVER SHEET
G-001	INDEX MAP
EX-001	SERGEANT TOWNSHIP EXHIBIT
C-200 - C-201	SITE NOTES AND DETAILS



LOCATION MAP
SCALE: 1" = 1,000'



USDA NRCS SOILS MAP
(WEB SOIL SURVEY AERIAL IMAGERY)
SCALE: 1" = 800'

USGS MAP
(SMETHPORT, CROSBY AND HAZEL HURST QUADRANGLES)
SCALE: 1" = 2,000'

OWNER, APPLICANT AND ENGINEER OF RECORD

APPLICANT:
RWE SOLAR DEVELOPMENT, LLC
1401 E 6TH STREET, SUITE 400
AUSTIN, TX 78702
PHONE: (267) 343-6920
CONTACT: EVAN GOOD

ENGINEER OF RECORD:
KIMLEY-HORN AND ASSOCIATES, INC.
50 SOUTH 16TH STREET, SUITE 3300
PHILADELPHIA, PA 19102
PHONE: (267) 687-0150
TOM KATELHON, P.E.

PROJECT DESCRIPTION NARRATIVE

THIS PROJECT PROPOSES THE INSTALLATION OF A ±400 MW AC GROUND-MOUNTED PRINCIPAL SOLAR ENERGY SYSTEM ACROSS 8 PARCELS WITH A DEVELOPED AREA OF ±3,515 AC. THIS PROJECT PROPOSES THE INSTALLATION OF A PRINCIPAL SOLAR ENERGY SYSTEM ACROSS 4 PARCELS WITHIN SERGEANT TOWNSHIP OVER A DEVELOPED AREA OF ±2,965 AC. THIS PROJECT INCLUDES THE CONSTRUCTION OF AN SES (SOLAR ENERGY SYSTEM) WITH ASSOCIATED SOLAR ARRAYS, INVERTERS, RACKING, PROJECT SUBSTATION, UTILITY SWITCHYARD, BATTERY ENERGY STORAGE SYSTEM (BESS), NEW CONNECTION GENERATION TIE-IN TRANSMISSION LINE, OPERATIONS AND MAINTENANCE BUILDING, ACCESS ROADS, FENCING AND OTHER NECESSARY IMPROVEMENTS, AND OTHER ASSOCIATED ANCILLARY EQUIPMENT, SITED ON PRIVATELY-OWNED LAND. THE PROJECT IS PROPOSING TO INTERCONNECT TO THE EXISTING STOLLE ROAD TO HOMER CITY STATION 345 KV TRANSMISSION LINE.

Project Parcels

Map Number	Parcel Number	Property Owner	Property Address	Township	Parcel Area (Acres)
1	29-002-100	MANULIFE INSURANCE CO ET. AL. C/O MIM FOREST MANAGEMENT	BLOOMSTER HOLW	SERGEANT	±1,362.00
2	29-001-104	MANULIFE INSURANCE CO ET. AL. C/O MIM FOREST MANAGEMENT	69 BLOOMSTER HOLW	SERGEANT	±4,668.00
3	29-003-100	MANULIFE INSURANCE CO ET. AL. C/O MIM FOREST MANAGEMENT	CLERMONT RD	SERGEANT	±562.60
4	29-002-300	MANULIFE INSURANCE CO ET. AL. C/O MIM FOREST MANAGEMENT	RED MILL RD	SERGEANT	±442.60

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PA 1

No.	REVISIONS	DATE	BY

Kimley»Horn

50 SOUTH 16TH ST, TWO LIBERTY PLACE, SUITE 3300
PHILADELPHIA, PA 19102
PHONE: 267-687-0150
WWW.KIMLEY-HORN.COM

NOT FOR CONSTRUCTION

KHA PROJECT 112647000	DATE 01/20/2026
SCALE: AS SHOWN	
DESIGNED BY: DMY	
DRAWN BY: ELD	
CHECKED BY: TGK	

SERGEANT TOWNSHIP
COVER SHEET

STARGAZER SOLAR
PREPARED FOR
RWE SOLAR DEVELOPMENT, LLC
SITUATED IN
HAMLIN, NORWICH AND SERGEANT TOWNSHIPS
MCKEAN COUNTY, PA

SHEET NUMBER
G-000

HAMLIN TOWNSHIP

KEATING TOWNSHIP
SERGEANT TOWNSHIP

SERGEANT TOWNSHIP

NORWICH TOWNSHIP

HAMLIN TOWNSHIP
SERGEANT TOWNSHIP

NORTHING: 573698.56
EASTING: 1753246.44

HAMLIN TOWNSHIP
SERGEANT TOWNSHIP

LOCATION MAP
SCALE: 1" = 1,000'

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINING PROPERTY LINE
- EXISTING MUNICIPAL BOUNDARY
- EXISTING FEMA SPECIAL FLOOD HAZARD AREAS
- EXISTING SURFACE WATER FEATURE FIELD DELINEATED
- EXISTING WATERCOURSE FIELD DELINEATED
- EXISTING WATERCOURSE PER NWI/NHD
- EXISTING STRUCTURE
- EXISTING 50' WELL PAD BUFFER
- EXISTING WETLANDS FIELD DELINEATED
- EXISTING WETLANDS PER NWI (NATIONAL WETLANDS INVENTORY)
- EXISTING KEEP OUT AREA
- PROPOSED SETBACK LINE
- PROPOSED WATERCOURSE BUFFER
- PROPOSED WETLANDS BUFFER
- PROPOSED SOLAR PANEL
- PROPOSED INVERTER

Sergeant Township Project Parcels

Map Number	Parcel Number	Property Owner	Property Address
1	29-002-100	MANULIFE INSURANCE CO ET. AL. C/O MIM FOREST MANAGEMENT	BLOOMSTER HOLW
2	29-001-104	MANULIFE INSURANCE CO ET. AL. C/O MIM FOREST MANAGEMENT	69 BLOOMSTER HOLW
3	29-003-100	MANULIFE INSURANCE CO ET. AL. C/O MIM FOREST MANAGEMENT	CLERMONT RD
4	29-002-300	MANULIFE INSURANCE CO ET. AL. C/O MIM FOREST MANAGEMENT	RED MILL RD

SOLAR ENERGY SYSTEM CHECKLIST

SERGEANT TOWNSHIP DIMENSIONAL STANDARDS		
REQUIREMENTS		PROPOSED
SOLAR ENERGY SYSTEM SETBACK		
MINIMUM FRONT YARD	50 FT	> 50 FT (C)
MINIMUM SIDE YARD	50 FT	> 50 FT (C)
MINIMUM REAR YARD	50 FT	> 50 FT (C)
MISCELLANEOUS		
MINIMUM LOT AREA	2 ACRES	> 2 ACRES (C)
MINIMUM LANDSCAPE BUFFER WIDTH	25 FT	25 FT (C)

LEGEND:
(C) = COMPLIES
(NC) = NON-COMPLIANT

NORTH

GRAPHIC SCALE IN FEET
0 500 1000 2000

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PA 1

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50 SOUTH 16TH STREET, SUITE 2300
PHILADELPHIA, PA 19102
PHONE: 267-687-0150
WWW.KIMLEY-HORN.COM

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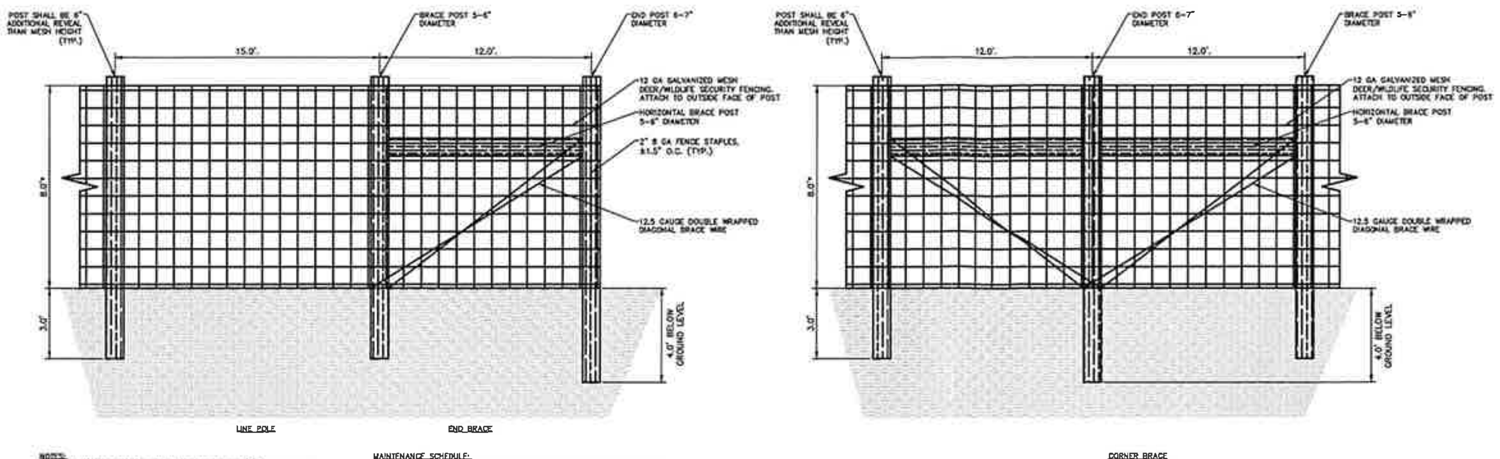
SERGEANT TOWNSHIP EXHIBIT

STARGAZER SOLAR
PREPARED FOR
RWE SOLAR DEVELOPMENT, LLC
SITUATED IN
HAMLIN, NORWICH AND SERGEANT TOWNSHIPS
MCKEAN COUNTY, PA

SHEET NUMBER
EX-001

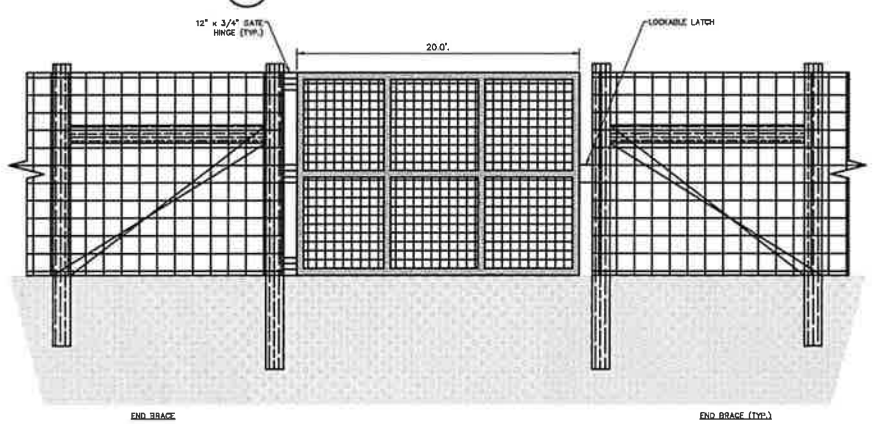


NOTES:
1. CONTRACTOR SHALL SUBMIT MANUFACTURER'S SHOP DRAWINGS FOR FENCING AND GATE DESIGN TO EOR FOR APPROVAL.
2. DETAIL PROVIDED SHOWS SCHEMATICALLY WHAT IS EXPECTED FOR DESIGN AND QUALITY.
3. ALL FENCING, GATES, AND ACCESSORIES SHALL BE GALVANIZED PER ASTM A123/A123M OR ASTM A153/A153M-09.
4. CONTRACTOR SHALL INCLUDE TWO (2) ADDITIONAL HINGES TO EACH SIDE OF THE LARGE MAIN GATE TO PREVENT SAGGING.

MAINTENANCE SCHEDULE:
1. MOWING MAINTENANCE WILL BE PERFORMED AT LEAST TWICE ANNUALLY DURING THE GROWING SEASON. MOWING WILL BE ACCOMPANIED BY SPOT SPRAYING AS NEEDED TO CONTROL WEEDS AND INVASIVES. THE FENCE WILL BE INSPECTED QUARTERLY, AND REPAIRS WILL BE MADE WITHIN 10 DAYS, IF NECESSARY

1 TYPICAL FENCING DETAIL

Scale: N.T.S.



2 TYPICAL GATE DETAIL

Scale: N.T.S.

GENERAL NOTES

1. ALL FENCING DESIGN INCLUDING POST, FABRIC, WIRE, BARS, RODS, FOUNDATION, AND OTHER ASSOCIATED WITH FENCE DESIGN SHALL BE PER THE STRUCTURAL ENGINEER. THOSE SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY.
2. UNLESS OTHERWISE IDENTIFIED ON PLAN, ALL FENCE SHALL BE COLOR-COATED.
3. STATE AND LOCAL STANDARDS AND SPECIFICATIONS PERTAINING TO A SPECIFIC SITE TAKE PRECEDENCE OVER THIS DRAWING.
4. ALL OPEN POSTS SHALL HAVE END-CAPS.
5. ALL SIGNS MUST BE MOUNTED ON INSIDE OF FENCE FABRIC.
6. MUSHROOM ANCHOR & PLUNGER REQUIRED FOR GATE.
7. GENERAL CONTRACTOR RESPONSIBLE FOR GATE LOCK.
8. THE KNOX BOX SHALL BE LOCATED AT OR NEAR THE RECOGNIZED PUBLIC ENTRANCE TO THE PROPERTY.
9. IN NO CASE SHALL THE KNOX BOX BE LOCATED AT A HEIGHT OF LESS THAN FOUR (4) FEET FROM THE GROUND OR MORE THAN SIX (6) FEET FROM THE GROUND; ALL OTHER LOCATIONS FOR THE KNOX BOX SHALL BE APPROVED BY THE FIRE MARSHALL.
10. A "KNOX BOX" OR COMPARABLE SET-UP WILL BE INSTALLED TO ALLOW EMS TO ACCESS THE SITE IF NECESSARY.
11. PROVIDE ACCESS KEYS TO THE FIRE MARSHALL TO BE SECURED INTO THE KNOX BOX. A SEPARATE KEY SHALL BE PROVIDED TO THE POLICE CHIEF, AND A SEPARATE SUB-MASTERED KEY SHALL BE PROVIDED TO THE CHIEF OF POLICE, AND A SEPARATE KEY TO THE DIRECTOR OF THE EMERGENCY MEDICAL SERVICES.
12. REFER TO ELECTRICAL PLANS FOR GROUNDING DETAILS.

3 NOTES

Scale: N.T.S.

NOTES:

1. ALL SIGNAGE SHALL BE POWER OWNER, DEVELOPER, UTILITY COMPANY, AND JURISDICTIONAL REQUIREMENTS. CONTRACTOR SHALL COORDINATE WITH APPROPRIATE PARTIES FOR SITE SIGNAGE.

4 GATE SIGNAGE DETAIL

Scale: N.T.S.

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SITE DETAILS 1

STARGAZER SOLAR

PREPARED FOR
RWE SOLAR DEVELOPMENT, LLC
SITUATED IN
HAMLIN, NORWICH AND SERGEANT TOWNSHIPS
MCKEAN COUNTY, PA

CALL BEFORE YOU DIG!

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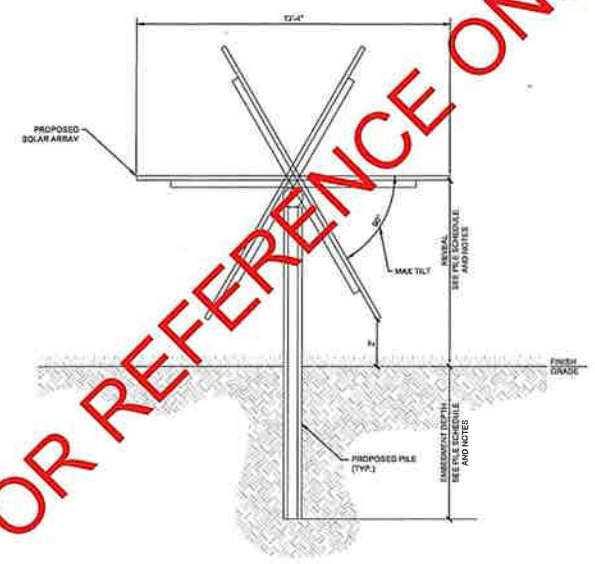
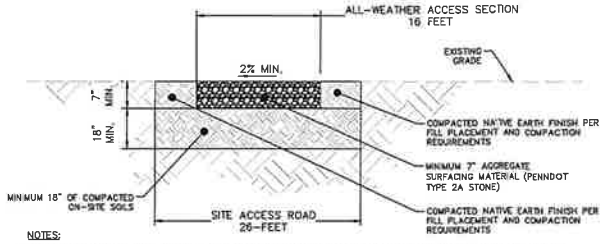


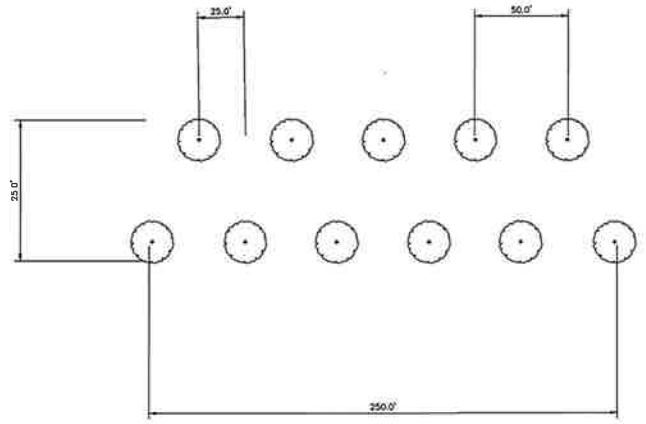
1 PROPOSED SOLAR ARRAY DETAIL (TYP.)
N.T.S.



NOTES:

1. PRIOR TO PLACING FILL, EXISTING VEGETATION, TOPSOIL, AND ROOT MATS SHOULD BE REMOVED. COMPLETE STRIPPING OF THE TOPSOIL SHOULD BE PERFORMED IN THE PROPOSED ACCESS ROAD AREAS. STRIPPING DEPTHS WILL PROBABLY EXTEND TO GREATER DEPTHS THAN THE TOPSOIL DEPTHS INDICATED DUE TO THE PRESENCE OF MINOR AMOUNTS OF ORGANICS, ROOTS, AND OTHER SURFICIAL MATERIALS THAT WILL REQUIRE REMOVAL AS A PART OF THE STRIPPING OPERATIONS. IN ADDITION, SEASONAL SOIL MOISTURE VARIATIONS CAN AFFECT STRIPPING DEPTHS. IN GENERAL, LESS STRIPPING MAY OCCUR DURING SUMMER MONTHS WHEN DRIER WEATHER CONDITIONS CAN BE EXPECTED. DUE TO THE HISTORY OF THE SITE BEING USED AS A FARMLAND AND OUR SOIL BORINGS, THE TOP 2.5 FEET OF THE SOIL SHOULD BE CONSIDERED DISTURBED. THE DEPTH OF REQUIRED STRIPPING SHOULD BE DETERMINED PRIOR TO CONSTRUCTION BY THE EXCAVATION CONTRACTOR USING TEST PITS, PROBES, OR OTHER MEANS THAT THE CONTRACTOR WISHES TO EMPLOY, AND THIS DETERMINATION SHOULD BE THE RESPONSIBILITY OF THE EXCAVATION CONTRACTOR.
2. THE EXISTING SUBGRADE SOILS FOR ACCESS ROAD AREAS CONSISTS OF LOW-TO-MEDIUM PLASTICITY LEAN CLAY (CL) AND FAT CLAY (CH) WITH VARYING AMOUNTS OF SAND AND GRAVEL, AS ENCOUNTERED IN THE BORINGS. IN PROPOSED PAVEMENT AREAS, UNSUITABLE HIGH PLASTICITY SOILS, IF ENCOUNTERED, SHOULD BE REMOVED TO A DEPTH OF 2 FEET BELOW PROPOSED PAVEMENT SUBGRADE AND REPLACED WITH COMPACTED STRUCTURAL FILL MATERIAL THAT MEETS THE REQUIREMENTS STATED IN THE FILL MATERIAL TYPES.
3. THE SUBGRADE SHOULD BE EVALUATED BY PROOFROLLING WITH AN ADEQUATELY LOADED VEHICLE SUCH AS A FULLY-LOADED TANDEM-AXLE DUMP TRUCK. DURING PROOFROLLING, AREAS WHERE THE NATIVE SOILS EXPERIENCE PUMPING OR RUTTING SHOULD BE SCARIFIED A MINIMUM OF 10 INCHES, MOISTURE CONDITIONED, AND COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY USING ASTM D-698. THE RECOMMENDED THICKNESSES SHOULD BE MEASURED AFTER FULL COMPACTION. THE WIDTH OF THE ROADWAY SHOULD EXTEND A MINIMUM DISTANCE OF 1 FOOT ON EACH SIDE OF THE DESIRED SURFACE WIDTH. THE PROOFROLLING SHOULD BE PERFORMED UNDER THE DIRECTION OF THE GEOTECHNICAL ENGINEER. AREAS EXCESSIVELY DEFLECTING UNDER THE PROOFROLL SHOULD BE DELINEATED AND SUBSEQUENTLY ADDRESSED BY THE GEOTECHNICAL ENGINEER. SUCH AREAS SHOULD BE UNDERCUT. UNDERCUT WITHIN STRUCTURAL AREAS SHOULD BE BACKFILLED WITH STRUCTURAL FILL. EXCESSIVELY WET OR DRY MATERIAL SHOULD EITHER BE REMOVED, OR MOISTURE CONDITIONED AND RECOMPACTED. AREAS EXHIBITING RUTTING OR DEFLECTION SHOULD BE OVER-EXCAVATED TO A DEPTH RECOMMENDED BY THE GEOTECHNICAL ENGINEER AND REPLACED WITH COMPACTED ENGINEERED FILL OR CRUSHED AGGREGATE BASE COURSE.
4. BASED UPON THE SUBSURFACE CONDITIONS DETERMINED FROM THE GEOTECHNICAL EXPLORATION, SUBGRADE SOILS EXPOSED DURING CONSTRUCTION ARE ANTICIPATED TO BE RELATIVELY WORKABLE; HOWEVER, THE WORKABILITY OF THE SUBGRADE MAY BE AFFECTED BY PRECIPITATION, REPETITIVE CONSTRUCTION TRAFFIC, OR OTHER FACTORS. IF UNWORKABLE CONDITIONS DEVELOP, WORKABILITY MAY BE IMPROVED BY SCARIFYING AND DRYING
5. ACCESS ROADS SHALL MAINTAIN A MAXIMUM LONGITUDINAL SLOPE OF 10%

2 PROPOSED ACCESS ROAD (TYP.)
N.T.S.



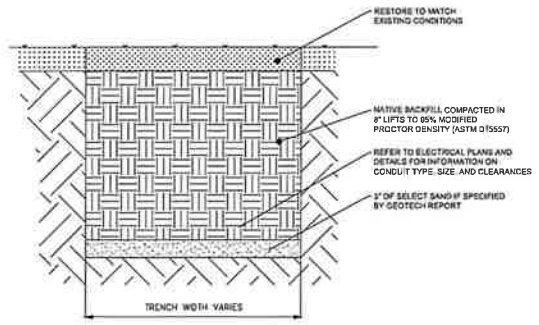
3 PROPOSED LANDSCAPE BUFFER (TYP.)
N.T.S.

CONCEPT PLANT SCHEDULE

EVERGREEN BUFFER TREES
Pinus strobus 'Fastigiata' / Eastern White Pine
Ilex opaca / American Holly
Juniperus virginiana / Eastern Red Cedar

NOTE:

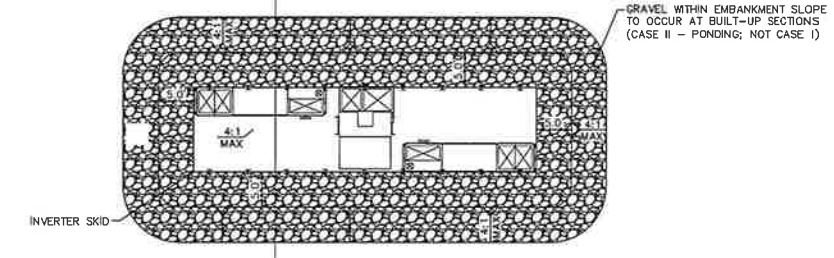
1. PLANTS NEEDED TO FORM THE VISUAL SCREEN SHALL BE OF SUCH SPECIES, SPACING AND SIZE AS CAN REASONABLY BE EXPECTED TO PRODUCE WITHIN THREE (3) YEARS A MOSTLY SOLID YEAR-ROUND VISUAL SCREEN AT LEAST SIX (6) FEET IN HEIGHT.
2. SPECIES, QUANTITIES, AND PLANTING SPECIFICATIONS OF DECIDUOUS AND EVERGREEN TREES TO BE PROVIDED DURING FINAL SITE PLAN APPROVAL.
3. AN AVERAGE OF ONE DECIDUOUS SHADE TREE, WITH MINIMUM TRUNK DIAMETER OF TWO (2) INCHES MEASURED SIX (6) INCHES ABOVE THE FINISHED GROUND LEVEL, SHALL BE PLACED FOR EACH FIFTY (50) FEET OF LENGTH OF THE BUFFER, PROVIDED, HOWEVER, THE DECIDUOUS SHADE TREES MAY BE CLUSTERED OR SPACED UNEVENLY TO PROVIDE A NATURAL LOOKING VISUAL ELEMENT.
4. IF HEALTHY TREES WITH A TRUNK DIAMETER OF SIX (6) INCHES OR GREATER (MEASURED 4.5 FEET ABOVE THE GROUND LEVEL) EXIST WITHIN THE BUFFER, THEY SHALL BE PRESERVED TO THE MAXIMUM EXTENT FEASIBLE TO MEET THE SAME PURPOSES AS THE NEW PLANT SCREENING
5. SHRUBS SHALL BE A MINIMUM OF THIRTY-SIX (36) INCHES AT THE TIME OF PLANTING.



NOTES:

1. TOP SOIL SHOULD BE SET ASIDE AND ONLY USED TO TOP OFF AREAS WHERE VEGETATION IS PROPOSED. ALL TOP SOIL SHALL BE COMPACTED TO 85% PER THE MODIFIED PROCTOR DENSITY TEST (ASTM D1557).
2. ONCE ALL ELECTRICAL CONDUITS OR CONDUCTORS ARE IN PLACE, RE-COMPACT THE DISTURBED NATIVE SOIL IN 8" LIFTS TO 95% PER THE MODIFIED PROCTOR DENSITY TEST (ASTM D1557).
3. ONSITE NON-ORGANIC SOILS ARE SUITABLE FOR USE AS BACKFILL CONTRACTOR TO ENSURE THAT SOILS ARE FREE OF DEBRIS CAPABLE OF DAMAGING CONDUIT OR CONDUCTORS. REFER TO EARTHWORK SPECIFICATIONS AND THE GEOGRAPHICAL REPORT FOR MORE INFORMATION.
4. REFER TO ELECTRICAL PLANS AND DETAILS FOR INFORMATION ON CONDUIT TYPES, SIZES, AND CLEARANCES.

4 UTILITY TRENCH
N.T.S.

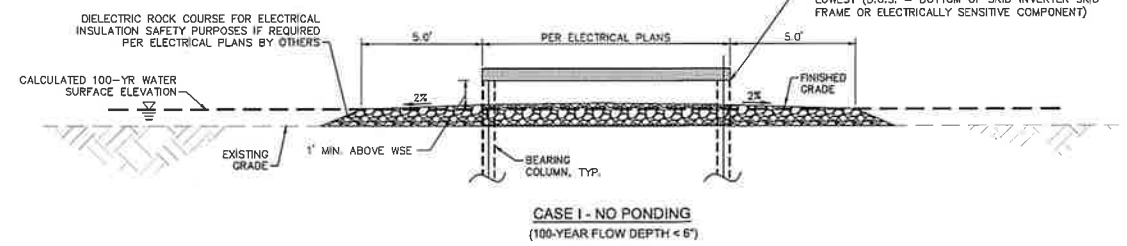


INVERTER SKID PLAN VIEW

NOTES:

1. EXISTING AND PROPOSED GRADE CONTOURS ARE OMITTED FROM DETAIL FOR CLARITY; CONTRACTOR TO BUILD PER THIS DETAIL AND AVOID GRADING BENEATH PROPOSED TRACKERS.
2. DETAIL ABOVE IS FOR ILLUSTRATIVE PURPOSES; REFER TO ELECTRICAL DRAWINGS AND STRUCTURAL DRAWING SHEETS FOR PAD DESIGN DETAILS, INCLUDING PILE EMBEDMENT AND REVEAL.
3. EARTHEN ACCESS EMBANKMENT WITH RAMP AND WORKING AREA IS TO BE CONSTRUCTED TO MEET ALL APPLICABLE OSHA, ELECTRICAL (NEC), AND BUILDING CODE ALONG FACE OF EQUIPMENT CABINETS PER ELECTRICAL ENGINEER. SPECIAL ACCESS NEEDS SHOULD BE COORDINATED WITH THE OWNER ON AS-NEEDED BASIS FOR OPERATIONS AND MAINTENANCE.
4. EARTHEN ACCESS EMBANKMENT WITH RAMP AND WORKING AREA IS TO BE CONSTRUCTED TO MEET ALL APPLICABLE OSHA, ELECTRICAL (NEC), AND BUILDING CODE. SPECIAL ACCESS NEEDS SHOULD BE COORDINATED WITH THE OWNER ON AS-NEEDED BASIS FOR OPERATIONS AND MAINTENANCE.
5. GRADE SURROUNDING EQUIPMENT SHALL BE ADJUSTED TO PROVIDE MINIMUM REACH HEIGHT TO EQUIPMENT PER NATIONAL ELECTRICAL CODE (NEC) OR OTHER APPLICABLE CODES.
6. WHERE EARTHEN ACCESS EMBANKMENT ENCROACHES INTO ACCESS ROAD, SLOPES ALONG ACCESS ROAD SHOULD NOT EXCEED 8% LONGITUDINAL OR 4% TRANSVERSE (CROSS-SLOPE).
7. EARTHEN ACCESS EMBANKMENT IS INTENDED FOR PEDESTRIAN ACCESS ONLY FOR MAINTENANCE PURPOSES; IT IS NOT DESIGNED OR ASSUMED TO BEAR INVERTER LOADS (PROVIDES NEITHER VERTICAL FRICTIONAL RESISTANCE NOR LATERAL BEARING RESISTANCE); MINIMUM EMBEDMENT DICTATED BY STRUCTURAL DESIGN SHALL BE MEASURED FROM EXISTING GRADE.

5 INVERTER SKID ENLARGED GRADING DETAIL
Scale: N.T.S.



INVERTER SKID SECTION "A"

CALL BEFORE YOU DIG!
PA 1
1-800-242-1776

NO.	REVISIONS	DATE	BY

Kimley»Horn

© 2026 KIMLEY-HORN AND ASSOCIATES, INC.
50 SOUTH 16TH STREET, SUITE 2300
PHILADELPHIA, PA 19102
PHONE: 267-687-0150
WWW.KIMLEY-HORN.COM

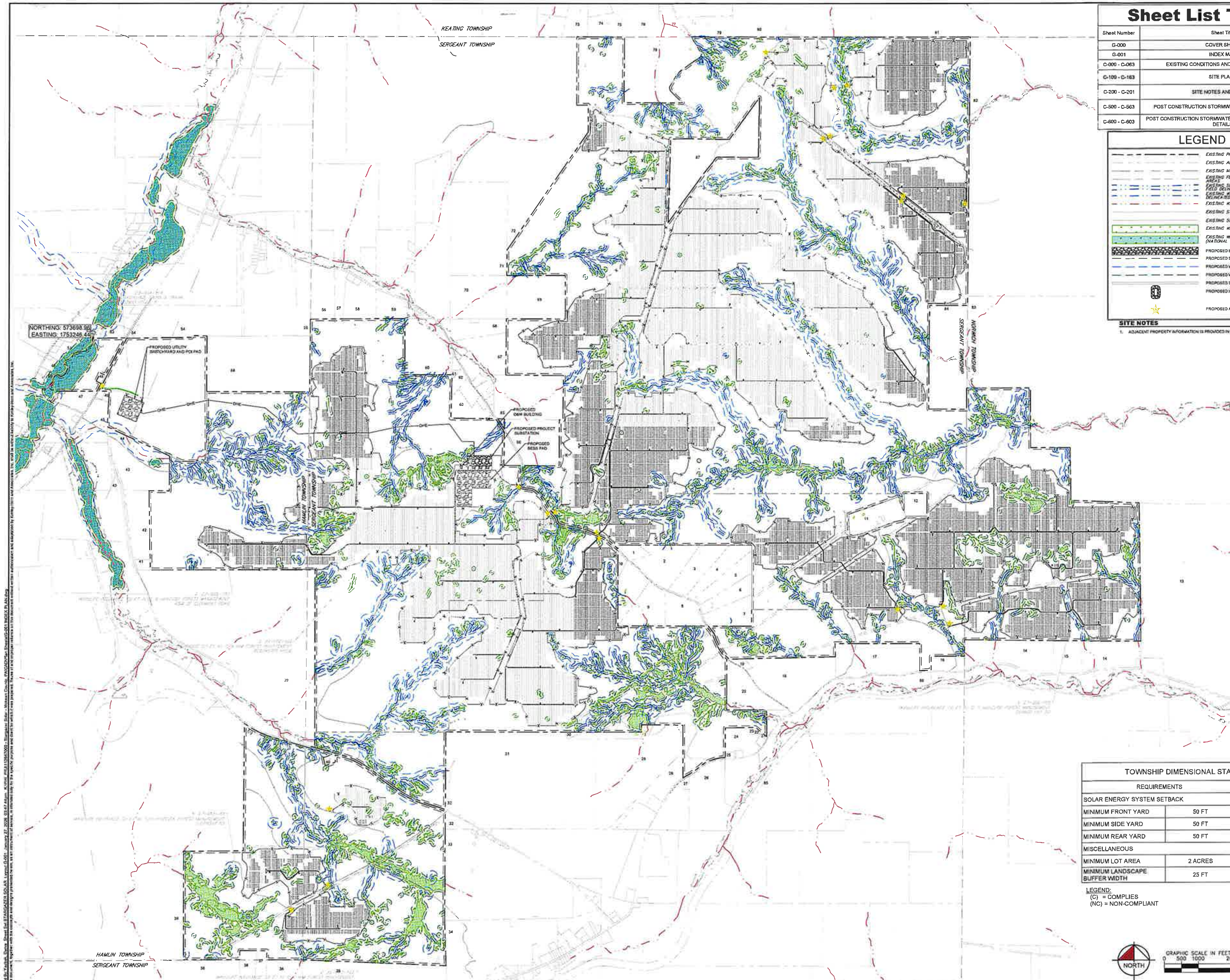
PRELIMINARY NOT FOR CONSTRUCTION

KHA PROJECT	172547000
DATE	01/20/2026
SCALE	AS SHOWN
DESIGNED BY	DMY
DRAWN BY	ELD
CHECKED BY	TGK

SITE DETAILS 2

STARGAZER SOLAR
PREPARED FOR
RWE SOLAR DEVELOPMENT, LLC
SITUATED IN
HAMLIN, NORWICH AND SERGEANT TOWNSHIPS
MCKEAN COUNTY, PA

SHEET NUMBER
C-201



Sheet List Table

Sheet Number	Sheet Title
G-000	COVER SHEET
G-001	INDEX MAP
C-000 - C-063	EXISTING CONDITIONS AND DEMOLITION PLANS
C-100 - C-163	SITE PLANS
C-200 - C-201	SITE NOTES AND DETAILS
C-500 - C-503	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
C-600 - C-603	POST CONSTRUCTION STORMWATER MANAGEMENT NOTES AND DETAILS

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINING PROPERTY LINE
- EXISTING MUNICIPAL BOUNDARY
- EXISTING FEMA SPECIAL FLOOD HAZARD AREAS
- EXISTING SURFACE WATER FEATURE FIELD DELINEATED
- EXISTING WATERCOURSE FIELD DELINEATED
- EXISTING WATERCOURSE PER NWI/NHD
- EXISTING STRUCTURE
- EXISTING 50' WELL PAD BUFFER
- EXISTING WETLANDS FIELD DELINEATED
- EXISTING WETLANDS PER NWI (NATIONAL WETLANDS INVENTORY)
- PROPOSED BESS/SUBSTATION/UTILITY PAD
- PROPOSED SETBACK LINE
- PROPOSED WATERCOURSE BUFFER
- PROPOSED WETLANDS BUFFER
- PROPOSED SOLAR PANEL
- PROPOSED INVERTER
- PROPOSED ACCESS POINT

SITE NOTES

1. ADJACENT PROPERTY INFORMATION IS PROVIDED IN SEPERATE ATTACHMENT.

TOWNSHIP DIMENSIONAL STANDARDS

REQUIREMENTS		PROPOSED
SOLAR ENERGY SYSTEM SETBACK		
MINIMUM FRONT YARD	50 FT	> 50 FT (C)
MINIMUM SIDE YARD	50 FT	> 50 FT (C)
MINIMUM REAR YARD	50 FT	> 50 FT (C)
MISCELLANEOUS		
MINIMUM LOT AREA	2 ACRES	> 2 ACRES (C)
MINIMUM LANDSCAPE BUFFER WIDTH	25 FT	25 FT (C)

LEGEND:
(C) = COMPLIES
(NC) = NON-COMPLIANT

NORTH

GRAPHIC SCALE IN FEET
0 500 1000 2000

CALL BEFORE YOU DIG!
PA 1

Kimley»Horn

50 SOUTH 16TH ST, TWO LIBERTY PLACE, SUITE 3300
PHILADELPHIA, PA 19102
PHONE: 267-687-0150
WWW.KIMLEY-HORN.COM

THOMAS C. KAELLON
ENGINEER
NOT FOR CONSTRUCTION

KHA PROJECT	112647000
DATE	01/20/2026
SCALE:	AS SHOWN
DESIGNED BY:	DMY
DRAWN BY:	ELD
CHECKED BY:	TGK

No.	REVISIONS	DATE	BY

INDEX MAP

STARGAZER SOLAR
PREPARED FOR
RWE SOLAR DEVELOPMENT, LLC
SITUATED IN
HAMLIN, NORWICH AND SERGEANT TOWNSHIPS
MCKEAN COUNTY, PA

SHEET NUMBER
G-001
2 OF 201

Exhibit 2

Book: 1078 Page: 1083

MCKEAN COUNTY
RECORDER OF DEEDS
MICHELE L. VOGEL-SNYDER, RECORDER
500 WEST MAIN STREET
SMETHPORT, PA 16749
(814) 887-3250

*RETURN DOCUMENT TO:
RWE CLEAN ENERGY DEVELOPMENT, LLC
701 BRAZOS ST
AUSTIN, TX 78701-3258

Instrument Number - 202500633
Recorded On 3/10/2025 At 10:29:42 AM
* Instrument Type - AGREEMENT
* Total Pages - 19
Invoice Number - 136372
* Grantor - JOHN HANCOCK LIFE INSURANCE COMPANY
* Grantee - RWE SOLAR DEVELOPMENT LLC
* Customer - SIMPLIFILE LC E-RECORDING

* FEES

STATE WRIT TAX	$0.50
STATE JCS/ACCESS TO JUSTICE	$40.25
COUNTY RECORDING FEES	$41.00
COUNTY IMPROVEMENT FEE	$2.00
ROD IMPROVEMENT FEE	$3.00
TOTAL PAID	$86.75

I hereby CERTIFY that this document is Recorded in the Recorder of Deeds Office Of McKean County, Pennsylvania

Michele L. Vogel-Snyder
Recorder of Deeds

RECORDER'S OFFICE * PA * MCKEAN COUNTY

THIS IS A CERTIFICATION PAGE

Do Not Detach

THIS PAGE IS NOW PART OF THIS LEGAL DOCUMENT

* - Information denoted by an asterisk may change during the verification process and may not be reflected on this page.

01A574

PREPARED BY, RECORDING REQUESTED BY AND WHEN RECORDED MAIL TO:

RWE Solar Development, LLC
ATIN: Lease and Title Administration
1401 E. 6th Street, Suite 400
Austin, TX 78702

APN(s):
Assessed Value:
Actual Consideration:

(Space Above for Recorder's Use)

MEMORANDUM OF FIRST AMENDMENT TO OPTION TO PURCHASE

This MEMORANDUM OF FIRST AMENDMENT TO OPTION TO PURCHASE (this "**Memorandum**") is made and entered into this 20th day of February, 2025 (the "**Amendment Effective Date**"), by and between JOHN HANCOCK LIFE INSURANCE COMPANY (U.S.A.), a Michigan corporation successor by merger to John Hancock Life Insurance Company, a Massachusetts corporation, f/k/a John Hancock Mutual Life Insurance Company, (herein "**Seller**") and RWE SOLAR DEVELOPMENT, LLC, a Delaware limited liability company, having an address of 1401 E 6th St, Suite 400, Austin, Texas 78701 (herein "**Buyer**").

RECITALS

A Buyer and Seller are the current parties to that certain Option to Purchase dated September 10, 2021 (the "**Original Option**"), as amended by that certain First Amendment to Option to Purchase dated January 30th, 2025 (the "**First Amendment**" and together with the Original Option, as amended from to time collectively referred to herein as the "**Option Agreement**") pursuant to which Seller granted Buyer an option to purchase the land described in Exhibit A, attached hereto and incorporated herein by this reference and depicted on the site plan attached hereto as Exhibit A-1 (the "**Property**").

B. Buyer desires to provide record notice of the Option Agreement by recording this Memorandum.

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Seller and Buyer do hereby agree as follows.

1. Pursuant to the Option Agreement, Seller granted to Buyer the option to purchase the Property (the "**Option**"). In the First Amendment the Option Period is extended to September 9, 2027.

2. This Memorandum is prepared for the purpose of recordation and shall not alter or affect in any way the rights and obligations of Seller and Buyer under the Option Agreement. In the event of any inconsistency between this Memorandum and the Option Agreement, the terms of the Option Agreement shall control.

[the remainder of this page is intentionally left blank; signatures and acknowledgements can be found on the following pages]

IN WITNESS WHEREOF, the parties hereto have executed this Memorandum on Memorandum Effective Date.

SELLER:

JOHN HANCOCK LIFE INSURANCE COMPANY (U.S.A.)

By: Manulife Investment Management Timberland and Agriculture Inc, its advisor

By: _____
Name: Ashley T. Miller
Title: Director, Resource Valuation

ACKNOWLEDGEMENT

STATE OF North Carolina }
} *S.S*
COUNTY OF Mecklenburg }

I, the undersigned Notary Public, in and for said County in said State, hereby certify that Ashley T. Miller, whose name as Director of Manulife Investment Management Timberland and Agriculture Inc, a Delaware corporation, the advisor of JOHN HANCOCK LIFE INSURANCE COMPANY (U.S.A.), a Michigan corporation, is signed to the foregoing instrument and who is known to me, acknowledged before me on this day that, being informed of the contents of the instrument, he, as such officer and with full authority, executed the same voluntarily for and as the act of said corporation.

Given under my hand this 28th day of February, 2025

_____
NOTARY PUBLIC

CHARLOTTE A. HAMILTON
Notary Public, North Carolina
Mecklenburg County
My Commission Expires
December 10, 2028

My commission expires: 12/10/2028

(Notary Seal)

BUYER:

RWE SOLAR DEVELOPMENT, LLC,
A Delaware limited liability company

By: _____
Name: Paul Bowman
Title: Senior Vice President

ACKNOWLEDGEMENT

STATE OF TX §
§
COUNTY OF Travis §

On this 4 day of February, 2025, before me, the undersigned notary public, personally appeared Paul Bowman SVP of RWE Solar Development, LLC, personally known to me or provided to me on the basis of satisfactory evidence to be the person who subscribed to the foregoing instrument on behalf of RWE Solar Development, LLC.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.
(notary seal)

NOTARY PUBLIC, STATE OF

PEARL ANN FLORES
My Notary ID # 135146394
Expires October 29, 2028

Name: Pearl Flores
My commission expires: 10/29/2028
Notary Registration No.: 135146394

Exhibit A to Memorandum
Legal description of the Property

The following described tracts or parcels of land located in McKean County as shown on the map attached hereto as Exhibit A-1 and being all or portions of the following tax parcels, APN Numbers:

24-014-402.01; 24-014-307.13; 29-002-300.00; 27-006-100.00; 29-001-104.00; 29-002-100.00; 23-005-103.00; 29-003-100.00; and 23-012-101.00

Premises Four 1-4-1, 2

FIRST, ALL THAT CERTAIN piece, parcel or lot of land situate, lying and being in the Township of Hamlin, County of McKean, State of Pennsylvania, and being part of Warrants 2470 and 2375 and being bounded and described as follows, to wit:

BEGINNING at a point in the center of the Warner Brook Road where the same crosses the Hamlin Township line, and running thence by said Township line south 356 rods to a post, the southeast corner of Warrant no. 2375; thence by the south line of the said Warrant west 231.4 rods to a post; thence north 192 rods to a post; thence east 104.4 rods to a post; thence north 212 rods to the center of the said road; thence southeasterly along the same to the place of beginning. Containing 426.7 acres of land, more or less.

SECOND, ALL THAT CERTAIN piece, parcel or lot of land situate, lying and being in the said Township of Hamlin, County of McKean, State of Pennsylvania, bounded and described as follows, to wit:

BEGINNING at a post, the southeast corner of Warrant 2573, and running thence by the south line of the said Warrant west 282 rods to a post, the southeast corner of a 9/25 acre lot of land now or formerly owned by E. Martin; thence north 143.4 rods to a post in the south line of a 50 acre lot of land now or formerly owned by A. Johnson; thence by the south line of the said Johnson lot east 35 rods to a post, the southeast corner of the same; thence by the said Johnson lot's east line north 57 rods to a post in the southerly line of a 130 acre lot now or formerly owned by George Richards; thence by the said line south 65 degrees east 38.6 rods to a post corner of the same; thence east 31 rods to a post, the southeast corner of the same; thence by the east line of the Richards lot north 127 rods to the southwest corner of a lot of 112.25 acre lot now or formerly of W. Marks; thence by the Marks' south line east 189 rods to a post in the line dividing the Townships of Hamlin and Sergeant; thence by said Township line south 323.5 rods to the place of beginning. Containing 389 acres, more or less, and being part of Warrant No. 2573.

Premises Five 1-5-1

ALL THAT CERTAIN piece, parcel, or tract of land situate in Norwich Township, McKean County, Pennsylvania, bounded and described as follows, to wit:

Lot #39 in the survey of the Ridgway lands made by Jonathan Colegrove. **BEGINNING** at a Beech tree, it being the corner of lots #29, #30, #39, and #40 of said survey; thence North 186 rods to a Birch it being the northeast corner of said lot #39; thence west 160 rods to a post being the northwest corner of said lot; thence south 186 rods to a Beech Tree, it being the southeast corner of lot #46; thence East 160 rods to place of beginning. Containing 186 acres, more or less, Warrants 2411 and 2412.

ALSO TWO TRACTS in Norwich and Sergeant Townships: (a) **BEGINNING** at a Beech tree, being the corner of Lots #39, #40, #45, and #46 in the said Colegrove Survey; thence north 186 rods to a post being the Northwest corner of Lot #39; thence east 80 rods on the north line of said lot #39 to a post corner; thence north 100 rods to a post corner; thence west 80 rods to a post corner in the west line of lot #38; thence north 86 rods to a post being the northeast corner of lot #47; thence west 160 rods to a Beech tree being the northwest corner of said lot #47; thence south 372 rods to a Beech tree being southwest corner of Lot #46; thence east 160 rods to place of beginning. Containing 422 acres, more or less, being part of lot 38 of said survey and of warrant 2411 and lot 47 of said survey in warrants 2411, 2410, and lot #46 of said survey in warrants 2411 and 2412.

Premises Nine 1-9-1

ALL THAT CERTAIN piece, parcel or tract of land situate, lying and being in the Township of Sergeant, County of McKean and State of Pennsylvania, bounded and described as follows, to wit:

BEGINNING at a post, the northwest corner of lands deeded to Adam Martin; thence north 451 rods to a Beech; thence north 35 degrees east 407 rods to a post in the east line of subdivision no. 69 at the J. Colegrove survey; thence by said line north 120 rods to a post in the town line, the northeast corner of said Subdivision no. 69; thence by the town line east 158 rods to a post the northwest corner of subdivision no. 51; thence by the west line of said subdivision no. 51 and of subdivision no. 52, 218 rods to a stone corner; thence south 45 degrees east 134 rods to a small Beech; thence south 29 rods to a post in the south line of subdivision no. 52; thence by said line east 58 rods to a post in the west line of subdivision no 49; thence by said line and of 48 and 47 south 465 rods to a post the northeast corner of lands deeded to G A. Easterbrook; thence by the north line of same and lands of P. Martin west 445 rods to a post the northwest corner of said P. Martin land; thence by the west line of same south 96 rods to a post in the north line of land of Adam Martin; thence by said line west 99 rods to the place of beginning. Containing 2,120.5 acres, more or less, being subdivision nos. 53, 54, 55, 64, 65, 66, 67, 68, 72 and 73 and part of subdivisions nos. 52, 69, 70, 71 81, 82, 83, 84 and 85 of the J. Colegrove survey in said Township of Sergeant.

EXCEPTING AND RESERVING from the above described premises all that certain piece, parcel or tract of land previously conveyed to Merle E. Dickinson by various deeds appearing of record, which said parcel of land is bounded and described as follows, to wit:

BEGINNING at an iron pipe on the boundary line of the Olds Rod and Gun Club tract and the Bayer estate, running south 35 degrees, said pipe corner being located 533.5 feet south 35 degrees west from an iron pin in the center of the old state road; the said state road being the same road that ran from Irons Hollow to The Bunker Hill Farm; thence east 1235 lineal feet more or less to a n iron pipe corner; thence north 1786 feet more or less to an iron pipe corner in the boundary line between the Olds Rod and Gun Club tract and the Bayer Estate; the boundary line running south 35 degrees west; thence south 35 degrees west along said boundary line 2171.5 feet more or less to the place of beginning. Containing 25 acres more or less.

TOGETHER WITH the right to use the Old State Road, which runs over and across the said 25 acre parcel; to the same extent as said rights were reserved by the grantors herein, or their predecessors in title, in the deeds conveying said 25 acres, more or less, to the above named Merle E. Dickinson.

ALSO EXCEPTING AND RESERVING from the parcel of land containing 2120.5 acres, more or less a parcel of land containing 141.67 acres, more or less, and being the same parcel of land conveyed to Merle E. Dickinson and Robert B. Apple by deed of Willard R. Merrell and wife, dated 9/24/1948, recorded in Deed Book Vol. 297 at page 337, McKean County records.

Premises Ten 1-10-1

ALL THE FOLLOWING described tract of land and premises situate in the Township of Sergeant, in the County of McKean and State of Pennsylvania, being part of Subdivision No. 74 in survey made by the late Jonathan Colegrove, in Warrants Nos. 2407 and 2408, and bounded as follows, to wit:

BEGINNING at the northeast corner of Adam Martin's lot; thence north 94.2 rods to the southeast corner of lot no. 73; thence west on south line of same 132 rods to original Hemlock (fallen) corner, being the northeast corner of lot no. 81; thence south on east line of same 94.2 rods to a corner in said Adam Martin's north line; thence east on same 132 rods to the place of beginning. Containing 77.7 acres, more or less.

TOGETHER WITH all the right title and interest of the Estate of Herbert Axberg, deceased, in a certain right of way over an existing roadway situate on the Peterson farm adjoining the 77.7 acre parcel described above. Said right of way leads from Sergeant Township Road known as the Bloomster Hollow Road in a westerly direction to the said 77.7 acre parcel.

TOGETHER WITH Right of way over existing roadway as in Deed Book Volume 25 page 819.

Premises Eleven 1-11-1

ALL THAT CERTAIN piece, parcel or tract of land situate, lying and being in the Township of Sergeant, County of McKean, State of Pennsylvania, bounded and described as follows, to wit:

BEGINNING at a post, the southwest corner of lot No. 95, and running thence by the south line thereof east 242.5 rods to the southeast corner of the same; thence by the east lines of lot nos. 95, 96, and 97, north 602.1 rods to a post, the northwest corner of lands now or formerly of L. Bayer; thence by the Bayer lands north line east 177.5 rods to a post; thence north 164 rods to the center of the Long Branch Road; thence by the center thereof North 30 degrees west 29 rods, north 50 degrees west 20 rods, west 12 rods, north 67 degrees west 11.2 rods, north 30 degrees west 8 rods and north 8 degrees east 30 rods to the south line of lot of land now or formerly of F. Seigert; thence by the south line of the Seigert lands, west 21.4 rods to a stone corner, the southwest corner of the same; thence by the west line of the Seigert lands, north 80 rods to a post in the south line of lands now or formerly of George Schleiff; thence by the south line of the same and of the J. A. Johnson lands, west 100 rods to a post, the southwest corner of the same; thence by the Johnson lands' west line north 80 rods to a post, the southeast corner of lands now or formerly of Shelander et al; thence by the Shelander's south line west 80 rods to a post, the southwest corner of the same; thence by Shelander's west line north 100 rods to a post in the south line of lot no. 101; thence by the said south line of lot no. 101 west 162 rods to a post, the northwest corner of lot no. 100; thence by the west lines of lots nos. 100, 99, 98, 97, 96, and 95, south 1107 rods to the place of beginning. Being Subdivisions Nos. 95, 96, 97, 98, 99 and parts of 91, 92 and 100 in J. Colegrove's survey and parts of Warrants nos. 2471, 2483, 2885, and 2988, and containing in all 1926 acres of land, more or less.

Premises Twelve 1-12-1

ALL THE FOLLOWING described tract of land and premises in the Township of Sergeant, County of McKean and State of Pennsylvania, bounded and described as follows, to wit:

BEGINNING at a post corner, it being the northeast corner of lot no. 56, and the southeast corner of lot no. 55 in the survey made of J. Colegrove, Esquire; thence west 320 rods to a post corner, it being the northwest corner of lot no. 63; thence south 200 rods to the southwest corner of said lot no. 63, a post corner; thence east 320 rods to the southeast corner of said lot no. 56, a post corner for the same; thence north 200 rods to the place of beginning. Being the said last no. Lots 56 and 63 agreeable to said Colegrove survey. Containing 400 acres of land, more or less.

UNDER AND SUBJECT to all exceptions and reservations, easements, and rights of way affecting the said land and more particularly under and subject to that certain agreement between John F. Tanner and Norman L. Marsh, not of record, dated 6/25/1948, wherein the said Norman L. Marsh assigned to the said John F. Tanner an equitable interest in said land acquired by him from Nicholas W. Scanlon and C. L. Burt, by written purchase contract of 12/15/1947, also not of record, and duly canceled and ended, but in which agreement Norman L. Marsh is to receive a 1/16th royalty interest in the oil, gas and coal and Nicholas W. Scanlon and C. L. Burt do in fulfillment of said agreement except and reserve unto the said Norman L. marsh of Norwich Township, McKean County, Pennsylvania, a royalty of 1/16th of all oil, gas, and coal, in on and under said land.

EXCEPTING AND RESERVING a 10 acre parcel conveyed to Leon J. Decker and Leon W. Hardleroad by deed dated 11/15/1961 and recorded in McKean County in Deed Book 406 at page 807.

Premise Twenty-Seven 1-27-1,2,3,5,6,7,8-C

ALL THOSE CERTAIN pieces, parcels, or tracts of land situate, lying and being in the Townships of Sergeant and Norwich, County of McKean, and Commonwealth of Pennsylvania, bounded and described as follows, to wit:

TRACT 1, SERGEANT TOWNSHIP 100 acres, more or less **BEGINNING** at a post, the southeast corner of lot originally surveyed and known as the Rector lot; thence east 44.5 rods to a post, the southwest corner of the Landenburg lot; thence north on said line 95 rods to a post the northwest corner of the Landenburg lot; thence east 51 rods and 5 links to a post corner; thence north 122 and 18 rods to center of old road leading from the turnpike to Martin's, a post corner on the south side; thence north 45 degrees west 3 rods along the center of the same to a post on the south side; thence west 93 rods and 17 links to a post corner; thence south 217 and 1/8 rods to the place of beginning.

Excepting from Tract 1 the following: **(a)** Excepting such rights released to the McKean and Buffalo Railroad Company by instrument dated 3/17/1875 and recorded in Misc. Book D page 202, McKean County Records; and by instrument dated 3/17/1875 and recorded in Misc. book D, page 204, McKean County Records.
(b) Excepting therefrom a tract of 1.71 acres and another tract of 3.75 acres, conveyed to the Buffalo Coal Company by deed dated 7/1/1875, and recorded in Deed Book Vol. U page 225, McKean County records, and by deed dated 7/1/1875 and recorded in Deed Book Vol. U page 224, McKean County Records.
© Also excepting therefrom a tract of 48.72 acres conveyed to Ira J. Patterson, W. Slater and George Houben by deed dated 5/6/1897 and recorded in Deed Book Vol. 94 page 550 McKean County Records, described as follows: **BEGINNING** at a post being the northeast corner of the lot deeded to Lawrence Bayer by N. F. Jones by deed dated 1/13/1887 and recorded 1/17/1887 in Deed Book Vol. 37 , page 134, McKean County records; thence south along the east of said lot 120 rods to a post corner; thence south 63 degrees 25 minutes east 29.5 rods to a post in the line of the right of way of the McKean and Buffalo Railroad, now the W.N.Y. & P.R.R.; thence along the said line of the right of way north 35 degrees 45 minutes east to a post in the said line of the right of way 73.09 rods; thence north 6 degrees 30 minutes west 86 rods to a post; thence west 54.39 rods to a post; thence south 12.7 rods to the place of beginning.
(d) Also excepting therefrom a tract of 2.32 acres of land, bounded as follows, to wit: **BEGINNING** at the intersection of the east line of a lot of land sold to George Houben by Lawrence Bayer by deed date 1897 with the center line of the highway leading from Clarmont to Colegrove; thence along the said center line of the highway north 41 degrees 15 minutes east a distance of 200 feet to a point in the center of the highway; thence along the centerline of the highway north 26 degrees 35 minute east a distance of 280 feet to a point in the center line of the highway; thence north 50 degrees 34 minutes west a distance of 433 feet to a post, being the northwest corner of the lot sold to George Houben by Lawrence Bayer as before mentioned; thence south 6 degrees 30 minutes east a distance of 680 feet to the place of beginning.

TRACT 2, SERGEANT TOWNSHIP 82 acres, more or less, being west part of lot 76 in survey made by J. Colegrove: **BEGINNING** at a post being the southwest corner of lot no. 76 in survey made by J. Colegrove; thence north 160 rods to a post in the northwest corner of said lot; thence east 82 rods to a post in the north line of said lot; thence south 160 rods to a post in the south line of said lot; thence west 82 rods to the place of beginning.

EXCEPTING from tracts 1 and 2, 46.51 acres, more or less as conveyed by L. Bayer to Willard Decker, by deed dated 8/1/1898, recorded in Deed Book Vol. 101 page 227, McKean County Records, described as follow: **ALL THOSE CERTAIN** pieces or parcels of land in the said Township of Sergeant bounded as follows, to wit: **BEGINNING** at a point in the center of the highway and in the east line of the lands owned by Lawrence Bayer and known as the Rector lot and being 41 rods south from the northeast corner thereof; thence south 81 degrees 44 minutes west a distance of 18.18 rods to a point in the highway; thence south 66 degrees 55 minutes west along the highway a distance of 18.18 rods to a point in the highway; thence south 54 degrees 10 minutes west along the highway a distance of 36.36 rods to a pont in the highway; thence south 87.61 rods to a post in the north line of lands of the Buffalo Coal Company, formerly A. I. Wilcox; thence east along said north line a distance of 81.53 rods to the line of the right of way of the W.N.Y. & P. R. R. Co. formerly the McKean and Buffalo railroad Company; thence north 17 degrees 55 minutes east along the right of way of the said Railroad Company a distance of 28.5 rods to a post in the line of the right of way, being the corner lands sold by Lawrence Bayer; thence along said line north 65 degrees 25 minutes west a distance of 29.5 rods to a post in the east line of the Rector lot; thence north along said east line 79 rods to the place of beginning.

EXCEPTING from Tract 2, and the premises conveyed in Deed Book G, page 82, 85.3 acres, more or less, conveyed by Elizabeth D. Bayer, et al, to George W. Silfies by deed dated 11/11/1914 recorded in Deed Book Vol. 170 page 291, McKean County Records, bounded as follows, to wit: **BEGINNING** at a post the northeast corner of Subdivision 79; thence west 74.4 rods to post, the northeast corner of land of E.L. Keenan; thence by east line of same and of the Woodruff lot south 167.7 rods to a post in the north line of subdivision 78; thence by said line and part of no. 77, east 89.4 rods to an iron post at the southwest corner of Decker land; thence by west line of same north 87.6 rods to the center of the public road; thence by center of same southwesterly to the west line of lands deed by Jones to L. Bayer; thence by said line north 87.4 rods to the place of beginning.

One-half acre of the above described premises was conveyed by Lawrence Bayer, et al to D. A. Easterbrooke, Jr., et al, Trustees by deed dated 4/23/1873, Deed Book S, page 289, granted and conveyed by L. Bayer to L. Bayer et al Trustees by deed dated 12/17/1888 Deed Book 47 page 464.

TRACT 3, SERGEANT TOWNSHIP containing 120 acres, more or less, part of lot 79 of J. Colegrove Survey. **ALL THAT CERTAIN** 120 acres of land, more or less, in Sergeant Township, being part of Subdivision no. 79 of the Colegrove Survey and being the same tract of land conveyed by S. Gilles to J. F. Mills 3/26/1839 and recorded in Deed Book E, page 263, described as follows: **ALL THAT** tract or portion of land containing 120 acres of land to be taken off the southeast corner of the Woodruff lot (so known) to run just far enough on the south and east lines of the said lot equal distance on each of said lines from the said southeast corner (having the north line parallel with the said south line and the west line parallel with the said east line: to make the said 120 acres, more or less.

EXCEPTING 369.3 acres, more or less, part of Subdivision 79 in J. Colegrove Survey, bounded as follows, to wit: **BEGINNING** at a post the northeast corner of land deeded by L. Rogers to L. Bayer and known as the Woodruff lot; thence by north line west 75 rods to post; thence south 148 rods to post in the north line of Subdivision 78; thence by said line east 75 rods to post, the southeast corner of the Woodruff lot; thence by east line north 148 rods to the place of beginning. Containing 69.3 acres, more or less, and being part of subdivisions 79 in J. Colegrove's Survey, Sergeant Township. Reserving the right of way for a road over above described lands, which is known as the old Corduroy Road.

TRACT 4, SERGEANT TOWNSHIP, 133 acres, Part of Lot 59, J. Colegrove Survey, part Lot 19, Wilson Survey, Warrant 2699.

BEGINNING at the center of the east and west road running past D. Easterbrook's at a point in the south side of said road, being the northeast corner of the Wernag Tract; thence South on the east line of said tract one hundred fifty-two (152) rods to a post corner; thence East one hundred forty (140) rods to a post corner; thence North one hundred fifty-two (152) rods to the center of said road to a post corner on the side; thence West along the center of same to the place of beginning.

TRACT 5, SERGEANT TOWNSHIP, 746.7 acres, Subdivision 93 and parts of Lots 80-81-82 and 92 in J. Colegrove Survey.

BEGINNING at a post the southeast corner of Subdivision No. 97; thence by east line North two hundred twenty-nine and four-tenths (229.4) rods to a post in the southwest corner of No. 92; thence by south line East one hundred seventy-seven and five-tenths (177.5) rods to a post; thence North one hundred sixty-four (164) rods to center of road a post in the south side; thence East twenty-six and five-tenths (26.5) rods to post in the west line of No. 81; thence by said line and No. 82 North eighty (80) rods to a stone the southeast corner of fifty (50) acres contracted to F. Seigert; thence East one hundred three and eight-tenths (103.8) rods to post; thence South two hundred seventy-nine and six-tenths (279.6) rods to post the southwest corner of two (200) acres deeded to Adam Martin; thence by south line East Ninety-nine and two-tenths (99.2) rods to post in west line of No. 75; thence by said line South one hundred ninety-three and eight-tenths (193.8) rods to post, southwest corner of said lot; thence by north line of No. 79 and 94 West four hundred seven (407) rods to the place of beginning.

TRACT 6, SERGEANT TOWNSHIP, 29.8 acres, part of Subdivision 91 and 92 in J. Colegrove Survey:

BEGINNING at a point in the center of the road, the northwest corner of the above described tract of land; thence along the center of said road North thirty degrees West (N.30° W) twenty-nine (29) rods; North fifty degrees West (N. 50° W.) twenty (20) rods; West twelve (12) rods; North sixty-seven degrees West (N. 67° W) eleven and two-tenths (11.2) rods; North thirty degrees West (N. 30° W.) Eight (8) rods; North eight degrees East (N.8° E.) Thirty (30) rods to post in said Seigert's south line; thence by said line East seventy-eight and six-tenths (78.6) rods to a stone northwest corner of the above described tract; thence by west line South eighty (80) rods to post; thence by north line West twenty-six and five-tenths (26.5) rods to the place of beginning.

TRACT 7, SERGEANT TOWNSHIP, 1058.3 acres, part of Subdivision 69-70-82-83-84-85-86-88-89 and 90 in J. Colegrove Survey, part of Warrants 2488, 2885, 2405, 2988, 2408 and 2407:

BEGINNING at a post in the north line of Sergeant Township the northwest corner of Subdivision No. 68; thence by west line South one hundred twenty (120) rods to a post; thence South thirty-five degrees West (S. 35° W.) Four hundred seven (407) rods to a beech; thence South three hundred eleven (311) rods to post northeast corner of said Bayer's previous purchase; thence by north line West one hundred three and eight-tenths (103.8) rods to stone southeast corner of fifty (50) acres contracted to F. Seigert; thence by said Seigert's east line and that of G. Schlieff North one hundred sixty (160) rods to a post the northeast corner of said Schlieff's lot; thence by north line West one hundred (100) rods to post southeast corner of sixty-two and five-tenths (62.5) acres deeded to J. Perry; thence by east line North one hundred (100) rods to post in south line of Subdivision No. 89, southwest corner of fifty (50) acres contracted to J. Bloomster; thence by south line East one hundred (100) rods to post southeast corner of same; thence by East line North eighty (80) rods to post northeast corner of same; thence by North line West one hundred (100) rods to post southeast corner one hundred (100) acres deeded to Swanson and Shelander; thence by east line North seventy-six (76) rods to post; thence North thirty-six degrees East (N. 36° E) two hundred twenty-five (225) rods to post in south line of Subdivision No. 86; thence North forty-eight(48) rods to post; thence West twenty (20) rods to post; thence North one hundred sixteen (116) rods to hemlock corner in said Township line; thence by said line East three hundred forty-three and six-tenths (343.6) rods to place of beginning.

Excepting from Tract 7 the following described premises, conveyed by J.L. Bayer; et al., to Claude Slade by deed dated May 3, 1912, and recorded in Deed Book Vol. 168, page 222, containing 76 acres, part of Warrant No. 2405:

BEGINNING at a post in the center of the old State road in the line dividing the Township of Sergeant and Keating; thence by said line West one hundred sixteen (116) rods to post and stones; thence South one hundred twenty-two (122) rods to post and stones; thence East one hundred five

(105) rods to the center of said State road; thence by center of same North fifty-four degrees fifteen minutes West (N. 54° 15' W) fifteen (15) rods; North forty-three degrees thirty minutes West (N. 43° 30' W) twenty-four (24) rods; North nineteen degrees thirty minutes West (N. 19° 30' W) six (6) rods; North thirty degrees thirty minutes East (N. 30° 30' E) twenty-six (26) rods; North forty-five degrees East (N. 45° E.) ten (10) rods; North fifty-five degrees thirty minutes east (N. 55° 30' E) forty-six and seven-tenths (46.7) rods; North twenty-seven degrees thirty minutes West (N. 27° 30' W) twenty-four (24) rods, and North thirty-three degrees thirty minutes West (N. 33° 30' W) thirteen and one-tenth (13.1) rods to place of beginning.

Also excepting from Tract 7 the interest conveyed by J.L. Bayer and wife, and Annabelle Sigmann and Husband to Merle E. Dickinson by deed dated January 21, 1946, and recorded in Deed Book Vol. 279, page 437, bounded as follows: .

BEGINNING at an iron pipe corner on the wire fence line being in the west boundary of the Olds Rod and Gun Club lands, and the same being North thirty-five degrees East (N. 35° E) a distance of six hundred ten (610) lineal feet from the southwest corner of a 25-acre lot heretofore purchased by the grantee from the said Olds Rod and Gun Club; thence West a distance of seventeen hundred forty-six and four-tenths (1746.4) lineal feet to a post corner; thence South a distance of twenty-four hundred ninety-four and three-tenths (2494.3) lineal feet to a post corner on the west fence line of the Olds Rod and Gun Club; thence North thirty-five degrees East (N. 35° E) along the said west boundary a distance of three thousand forty-four and nine-tenths (3044.9) lineal feet to the place of beginning.

TRACT 8. SERGEANT and NORWICH TOWNSHIPS, 363.5 acres, more or less, part of Subdivisions 40-45-57-62 and 75, J. Colegrove Survey:

BEGINNING at the southeast corner of Subdivision No. 39 as deeded to J. Colegrove; thence West on south line of lands deeded to J. Colegrove, W.F. Kittredge and G.A. Bradbrock in Nos. 39,46,56, and 63, six hundred sixty (660) rods, more or less, to said Bradbrock's southwest corner, being post and stones on A. Martin's east line; thence South on said line thirty-four (34) rods to a post, it being said Martin's southeast corner; thence West on south line of same one hundred thirty-four and four-tenths (134.4) rods to post corner in east line of No. 80; thence South on east line of same one hundred ninety-two (192) rods to post corner, being the southeast corner of same in north line of lands deeded to J.M. Bayer; thence East on said north line seventy-eight and six-tenths (78.6) rods to post corner; thence North on west line of same fifty-eight and five-tenths (58.5) rods to post, it being the extreme northwest corner of the same; thence East on north line fifty-five and eight-tenths (55.8) rods to post corner in west line of 62; thence North on same fifty-seven and five-tenths (57.5) rods to old road, it being the south line of lands deeded to G.B. Backus; thence Westerly along center of the same fifty-three and four-tenths (53.4) rods to a post, being the extreme west corner of said Backus lot; thence East on north line of same one hundred ninety (190) rods to post corner of same; thence North on same thirty-two (32) rods to post, it being the northwest corner of same; thence East on said north line one hundred sixty (160) rods to post, it being the northeast corner of same; thence South on same east line sixty-one (61) rods to center of the road; thence Easterly along the said road sixteen and five-tenths (16.5) rods to post in west line of No. 45; thence North on said line seventy-nine (79) rods to post corner; thence East three hundred thirty-seven (337) rods to post corner in west line of No. 29; thence North on same forty-three (43) rods to place of beginning.

Premises Twenty-Eight 1-28-1

ALL THAT CERTAIN piece, parcel or tract of land situate, lying and being in the Township of Sergeant, County of McKean, and State of Pennsylvania, bounded and described as follow, to wit:

BEGINNING at an iron pipe corner marking the northwest corner of the Bunker Hill farm, now owned by the Heineman Estate, and also marking the northeast corner of the farm of H. Axberg; thence north 2376 feet to an iron pipe corner; thence east 2597.2 feet to an iron pipe corner; thence south 2376 feet to an iron pipe corner on the north line of said Bunker Hill farm; thence by the north line of said Bunker Hill farm; thence by the north line of said Bunker Hill farm west 2597.2 feet to the place of beginning.. Containing 141.67 acres, more or less, said premises being laid out in accordance with survey made by C. L. Lorah, Registered Engineer, in February, 1942.

TOGETHER WITH the right of way over and across the above described tract of land to the same extent and as fully as said right of way was conveyed to Willard R. Merrell by the deed above recited.

Premises Twenty-Four 10-24-1

ALL THAT CERTAIN piece, parcel, or tract of land situate, lying and being in the Township of Keating, County of McKean, State of Pennsylvania, bounded and described as follow:

BEGINNING at an iron pipe, the northwest corner of lot 33 of the Bingham Estate allotment in said Township and County; thence along the east line of that portion of Bingham lot 27 conveyed to Walter E. Perry by deed recorded in McKean County Deed Book 281 page 410, north 43 degrees west 14.8 rods to an iron pin; thence south 82 .5 degrees west 50.6 rods to an iron pipe; thence south 67.75 degrees west 11.7 rods to an iron pin in the south line of said lot 27; thence along said line north 89 and 3/8 degrees east 70.9 rods to the place of beginning. Containing 3.0 acres, more or less.

Premises Twenty-Six 10-26-1

ALL THAT CERTAIN piece, parcel or tract of land situate, lying and being in the Township of Keating, County of McKean and Commonwealth of Pennsylvania, bounded and described as follows, to wit:

BEGINNING at a point in the southwest corner of a lot contracted to be sold to William Ripley by the Trustees of the Bingham Estate; thence south 89.5 degrees east along the south line of said Ripley lot 101.2 perches; thence along the west line of lot 194 conveyed to Isaac Brown by the said Bingham Trustees south 4 degrees west 79.84 perches; thence along the south line of Keating Township north 85.25 degrees west 101.2 perches to a point; thence north 4 degrees east on a line parallel with the east line of the land hereby conveyed 79.84 perches, more or less, to the place of beginning. Containing 50 acres, be the same, more or less.

ALSO, a 50 foot wide right of way described as follows: **BEGINNING** at a point which is the intersection of the western right of way line of Township Road #347, commonly known as Irons Hollow Road, and the south boundary line of lot Nº 25, now or formerly the property of Otis Carl; thence a distance of 245 feet, more or less in a southeasterly direction along the western right of way line of Township Road 347, commonly know as the Irons Hollow Road, to the point of beginning of this conveyance; thence south 60 degrees 15 minutes west a distance of 810 feet to a point; thence southwesterly from said point to the northeastern corner of the parcel conveyed above.

Premises Forty-Seven 10-44-1

All that piece or parcel of land in Keating Township, McKean County, Pennsylvania, described as follows:

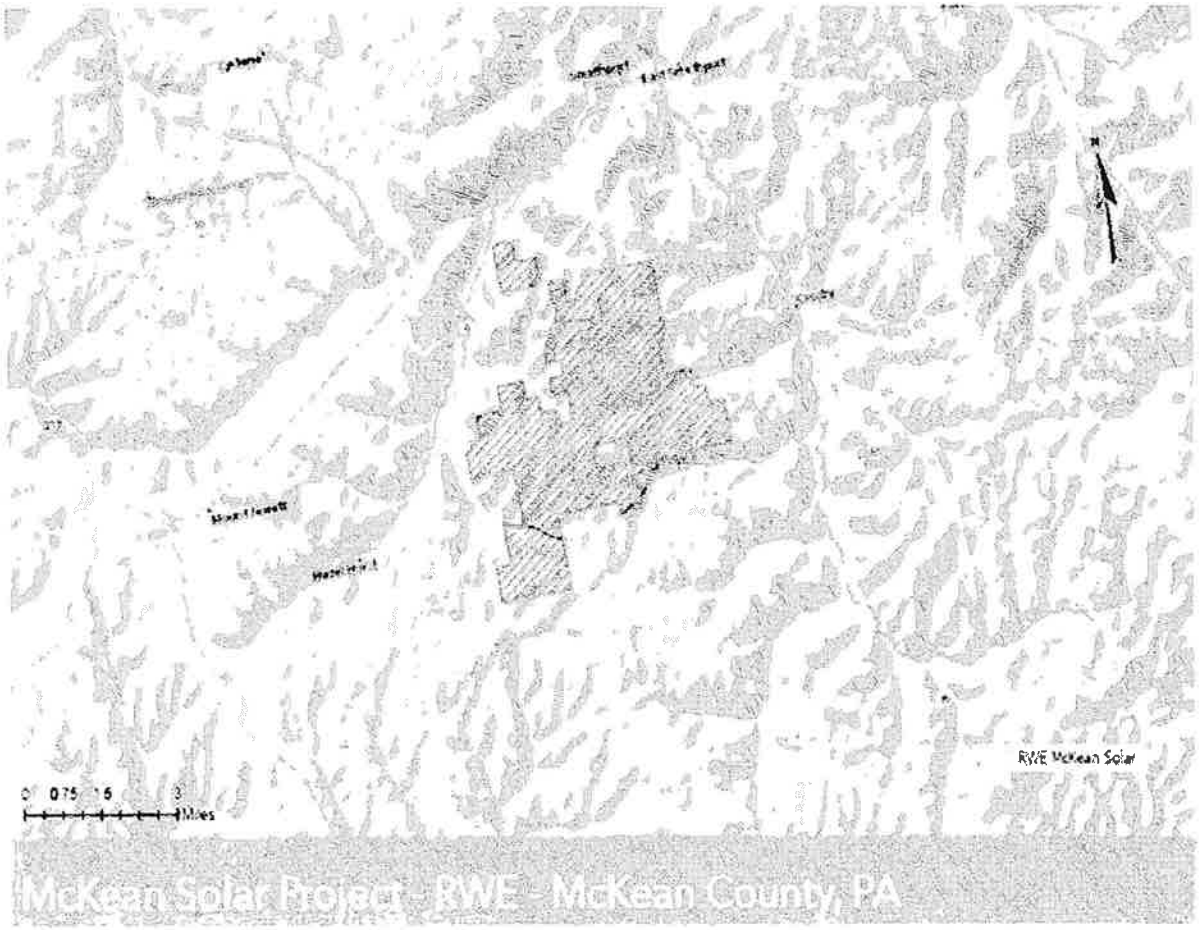
BEGINNING at the southwest corner of Lot 27 of the Bingham Estate allotment in said Township and County, thence along the south line of said lot south 86 and 7/8 degrees east 118.5 rods, thence South 2 ½ degrees west 99.6 rods, thence south 87.4 degrees east, 24.5 rods; thence south 1 ½ degrees west, 81.1 rods; thence south 4 degrees west 79.84 rods; thence 85.25 degrees west, 149 rods; thence north 2.63 degrees east 90.51 rods; thence north 4.75 degrees east 158.8 rods to the place of beginning, containing 214.8 acres and being part of Warrant 2239.

And also hereby conveying to the grantee herein a right of way over other lands of former grantor south of the iron pipe at the northwest corner of said property, and following the following courses and distances and being 25 feet wide; north 69 degrees west, 6.64 rods, thence north 76 degrees west 8.80 rods; thence north 84 ¼ degrees west 64 rod; thence north 2 ¼ degrees east 23.44 rods, thence north 5 ¼ degrees west 8 rods, thence 13 ½ degrees west 9 rods to Route 6, at a point in Route 6, one mile southwest of the junction of said Route 6 and township road T 347.

Former grantors reserved the right to develop and use a certain spring on the land herein conveyed, said spring being 400-500 feet southeasterly from the northwest corner of said land, it being understood that any pipes from said spring shall be laid at a sufficient depth so as not to hinder any future timber management. No large trees shall be cut in such water operation without consent of grantee herein.

Also excepting thereout and therefrom (Premises Forty-Seventh) the premises conveyed in Deed from Hammermill Paper Company to Walter E. Perry and Ruby I. Perry, husband and wife, dated November 11, 1957 and recorded November 19, 1957 in Volume 371, Page 125.

EXHIBIT A-1 to Amendment
Site Plan depicting the
"Property"



Tracts SU0801 and SU0805

Exhibit 3

Stormwater Management Report

Stargazer Solar

Hamlin, Sargeant, and Norwich Townships

McKean County, PA

Prepared for:

RWE Solar Development, LLC
1401 E 6th Street, Suite 400
Austin, TX 78702

112647000
Original – 1-20-2026
50 S 16th Street, Suite 3300
Philadelphia, PA 19102
267-687-0150

Thomas Katelhon, P.E.

Kimley»Horn

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1.0 EXECUTIVE SUMMARY

1.1 PROJECT OVERVIEW

The following report will provide details on how the proposed stormwater management design will be utilized to achieve compliance with the McKean County Stormwater Management Plan Phase II, PADEP FAQ for Chapter 102 Permitting for Solar Panel Farms (dated 01/02/19 last revised 04/30/2021) and all the standard design criteria from 25 Pa. Code Chapter 102.8(g)(2) and (3).

The subject properties are situated in Hamlin, Sargeant, and Norwich Townships across eight (8) parcels totaling approximately +/- 3,515 acres of disturbed land. The existing development property consists of open land, woodlands, and delineated stream and wetland areas that have been field verified by a wetlands specialist.

The Stargazer Solar project consists of installation of solar array fields within Hamlin, Sargeant, and Norwich Townships, McKean County, Pennsylvania. The solar fields will have an interconnection point in addition to various other equipment and appurtenances (e.g. battery energy storage system (BESS), switchgear, inverters, substation, and overhead and underground electrical conveyance). The solar array fields are serviced by crushed aggregate access roads. Minor earth disturbance is associated with solar panel installation and the focus of this report will be to mitigate stormwater runoff from all access roads and equipment pad areas servicing the project.

1.2 GENERAL SITE DESCRIPTION AND CONSIDERATIONS

The site contains multiple points of analysis. Existing structures and other existing impervious features are generally outside of the proposed development areas designated for installation of the solar arrays. Drainage areas feeding existing streams are intended to maintain current hydrologic patterns and preserve the water sources.

The proposed site improvements consist of ground mounted solar panel on steel racks with driven beams as the preferred foundation support with crushed aggregate access roads and operation/maintenance staging areas. The proposed gravel access road/pad area stormwater runoff will be directed to adjacent Stormwater BMPs (infiltration basins) placed downslope of proposed impervious areas throughout the site. The elevated ground-mounted solar arrays will provide grass/meadow conditions underneath, thus mimicking the pre-existing hydrology. The proposed infiltration basins will achieve groundwater recharge requirements in accordance with McKean County Stormwater Management Plan Phase II.

2.0 METHODOLOGY AND PARAMETER DEVELOPMENT

A hydrologic analysis of the subject property was performed for both existing and proposed conditions to determine flow patterns, peak flows rates, and stormwater management requirements. The 2023 HydroCAD® (HydroCAD Software Solutions LLC) computer program was used to perform the hydrologic analysis for this project for the peak flow mitigation for the 2-, 10-, 25-, 50- and 100-year, 24-hour design storms. The Curve Number (SCS) Method was utilized to estimate peak discharges for the associated drainage areas. All calculations utilized the rainfall intensities obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14.

The following groundcover assumptions were made for regulated activities involving development sites:

- Existing, non-forested, pervious areas are considered meadow.

- Conventional BMP stormwater management facilities (i.e. infiltration basins) must empty over a period of time not less than 24 hours and not more than 72 hours from the end of the facility's inflow hydrograph. Infiltration tests performed at the facility locations and proposed basin bottom depths, in accordance with the BMP Manual, must support time-to-empty calculations if infiltration is a factor in the sizing of the stormwater management facility.

Pre- and post-development time-of-concentrations paths shall be delineated on topographic mapping with the end and beginning clearly identified. Times of concentration shall be based on the following:

- The maximum length of overland sheet flow shall be one hundred (100) feet before shallow concentrated or open channel flow develops and shall be justified using the methodology presented in Chapter 3 of the NRCS technical Release 55 (TR-55) to include the following. For pre- and post-development conditions, the sheet flow Manning's n value of 0.24 (dense grasses) shall be utilized for meadow type conditions, a Manning's n value of 0.40 (woods, light underbrush) for wooded conditions, and a Manning's n value 0.011 (smooth surfaces) for paved conditions.

The following Post Construction Stormwater Management specifications were utilized to meet the requirements of the PA DEP Chapter 102 Permitting for Solar Panel Farms, FAQ dated January 2, 2019, revised April 30, 2021, version 1.1. Refer to the stand-alone document that goes into details on how the project design meets applicable Sections of the Department's FAQ Chapter 102 Permitting for Solar Panel Farms. This section specifically references how stormwater from the dripline of the solar panels will not create a scour condition when panels are aligned north to south with existing and/or proposed contours running perpendicular to the panels.

- First and foremost, the array areas are proposed to be seeded with ERNST Mix 186-1 (Ernst Solar Farm Seed Mix) which is a mix of native grasses that grow up to 3 feet in height while still providing 2 feet of clearance from solar panels. The densely planted natural vegetative seed area is required to provide a minimum 90% vegetative cover that will retain more water than traditional turf grasses while reducing soil erosion and improving soil health for future land uses. In order to help achieve the 90% vegetative cover the seed mix will be installed with cover crops to provide multiple benefits such as controlling erosion, suppressing weeds, reducing soil compaction, increasing moisture and nutrient content of soil to allow the main seed mix to flourish.

3.0 PRE-DEVELOPMENT CONDITIONS

The pre-development condition of the eight (8) parcels will consist of twenty-six (26) points of analysis (POA).

The 26 POAs ultimately convey to the following receiving waters: Marvin Creek, Jet Brook, Warner Brook, Bloomster Hollow, Shelander Hollow, Stone Dock Hollow, Trib. 57785 to Warner Brook, Martin Run, Trib. 50849 to Martin Run, Irons Hollow, Trib. 57756 to Irons Hollow, Trib. 57768 to Bloomster Hollow, Boyer Brook, Donley Fork, Robbins Brook, Wernwag Hollow, Browns Mill Hollow, Trib. 57887 to Red Mill Brook, Trib. 57886 to Red Mill Brook, Trib. 57885 to Red Mill Brook, and Trib. 57884 to Red Mill Brook.

4.0 POST-DEVELOPMENT CONDITIONS

The post development conditions of the site maintain the same Points of Analysis and relative drainage patterns. There is an increase in impervious coverage in the post development conditions that will generate additional runoff volume and higher peak rates. The proposed improvements have been designed to implement proposed infiltration basins to act as a multi-purpose BMPs (i.e. peak rate reduction and volume control) to mitigate the effects of added impervious coverage.

Tributary area to the points of interest has been delineated and hydrographs have been generated for the 2-, 10-, 25-, 50- and 100-year design storms. These hydrographs have implemented the BMP's and determine the total post development discharge rates.

5.0 STORMWATER MANAGEMENT ORDINANCE COMPLIANCE

5.1 VOLUME CONTROL REQUIREMENTS

Per Section VII of the McKean County Stormwater Management Plan, volume control BMPs shall be used to not increase the post-development total runoff volume for all storms equal to or less than the 2-year 24-hour duration precipitation compared to the pre-development condition.

The low impact development practices provided in the Pennsylvania Stormwater BMP Manual shall be utilized for all regulated activities to the maximum extent practicable. Water Volume controls shall be implemented using the Design Storm Method (Volume Control Guideline 1 in the PA BMP Manual).

The site meets the required volume control reductions through the usage of infiltration basin BMPs.

5.2 STORMWATER PEAK RATE CONTROL AND MANAGEMENT DISTRICTS

Per Section VII of the McKean County Stormwater Management Plan, for areas not covered by a Release Rate Map: Post-development discharge rates shall not exceed the pre-development discharge rates for the 2-, 10-, 25-, 50-, and 100-year storms.

The site meets the required rate control reductions through the usage of infiltration basin BMPs.

5.3 WATER QUALITY REQUIREMENTS

The site meets the required water quality reductions through the usage of infiltration basin BMPs.

6.0 CONCLUSIONS

The results of the analysis indicated that the stormwater management program, described within this report, has been designed to meet the requirements of the McKean County Stormwater Management Plan Phase II, PADEP FAQ for Chapter 102 Permitting for Solar Panel Farms (dated 01/02/19 last revised 04/30/2021) and all the standard design criteria from 25 Pa. Code Chapter 102.8(g)(2) and (3). for groundwater recharge and stormwater peak rate standards through the implementation of infiltration basin BMPs.

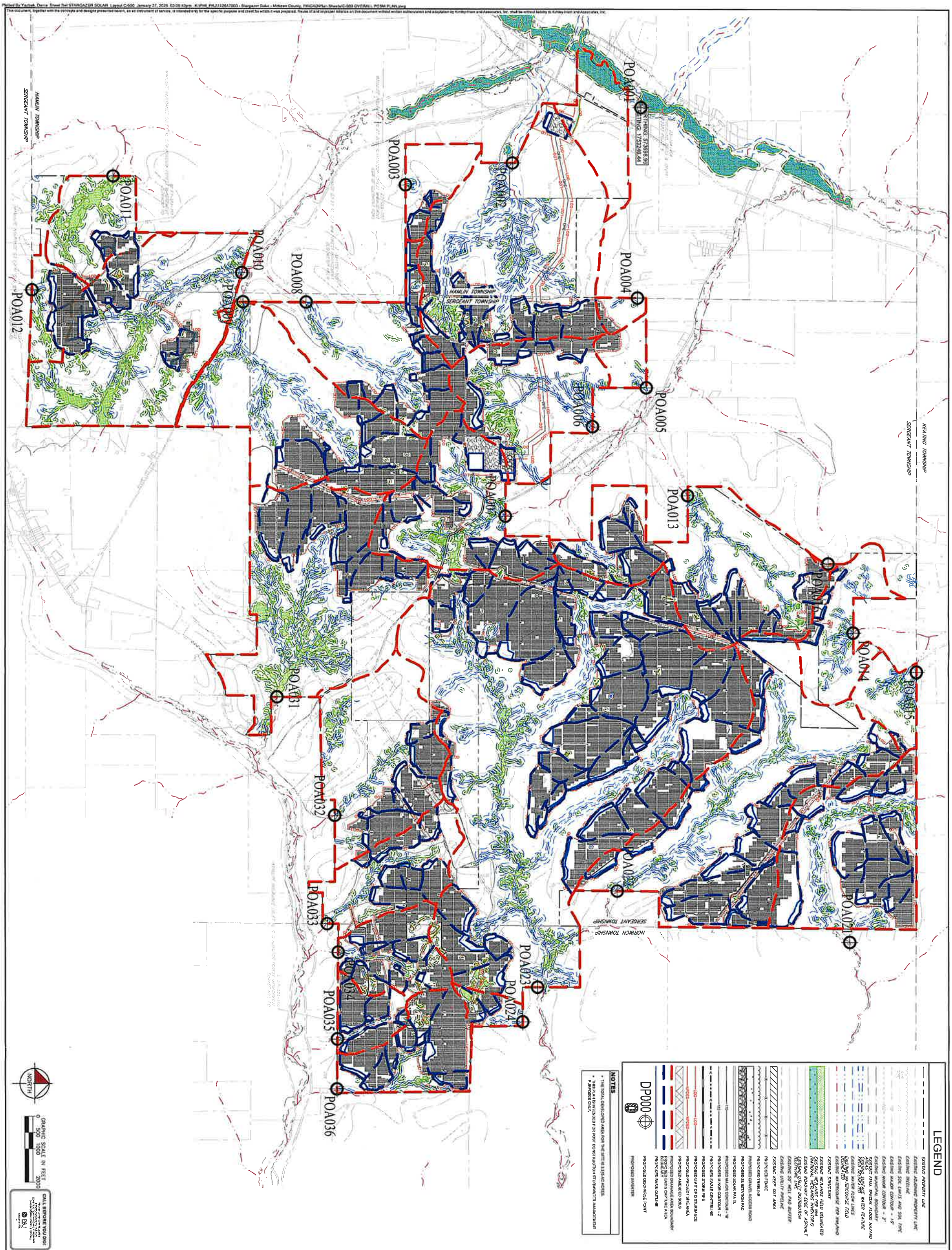


Exhibit 4

Solar Glare and Glint Analysis Report

for

Stargazer Solar

McKean County, Pennsylvania

January 2026

Kimley»Horn

Introduction

The Stargazer Solar Project (Project) is a proposed solar panel project, represented in **Figure 1** as the shaded blue areas, located south of Smethport in McKean County, Pennsylvania. The use of the data is up to the client, including the determination if any glare is allowed for this development and if further steps should mitigation be required for any glare identified. See **Figure 1** for vicinity map with receptors and Project location. Observation points are indicated with yellow pins and routes are indicated with red paths.

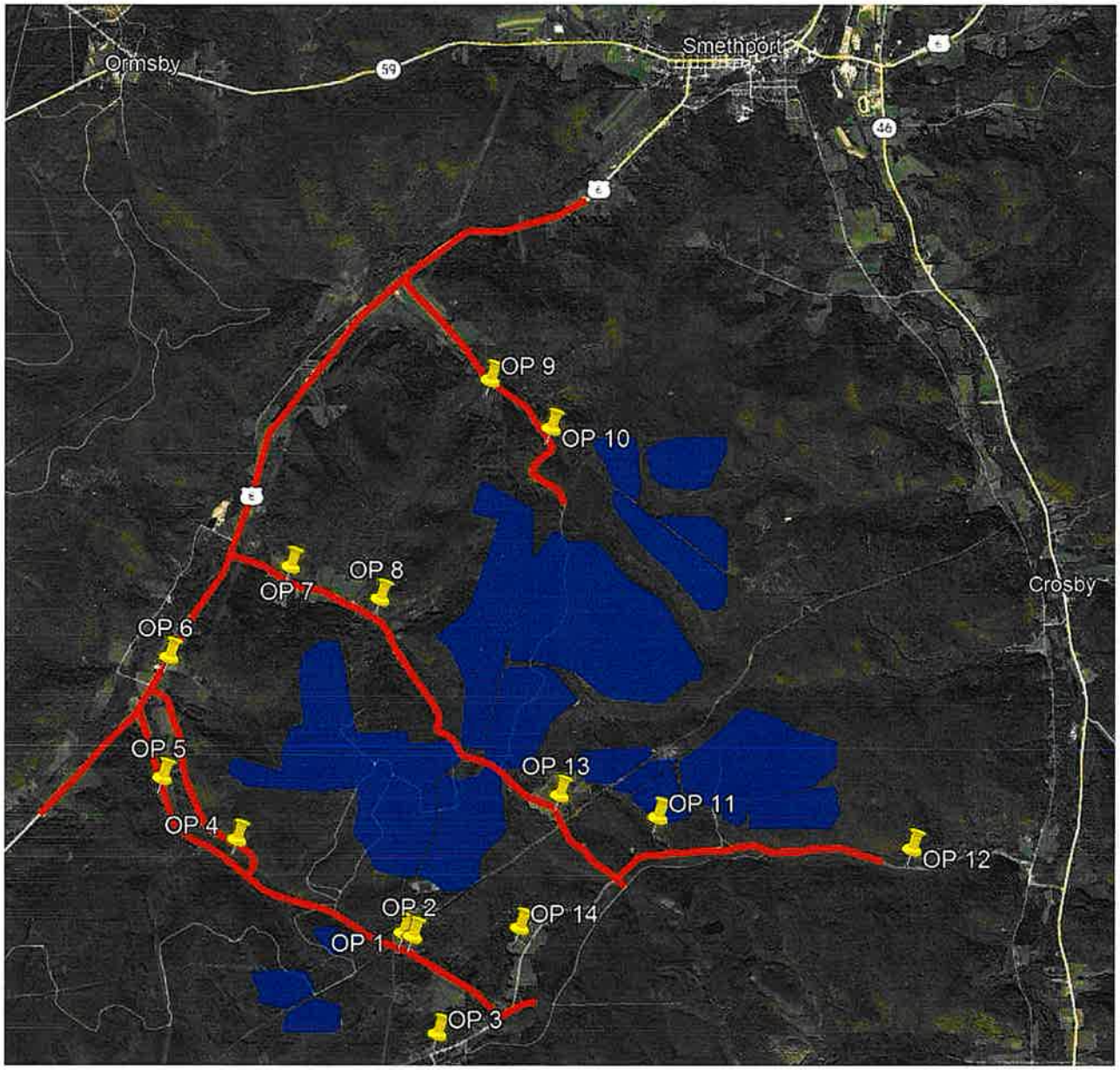


Figure 1: Project Location

Kimley Horn completed a glare analysis using the Solar Glare Hazard Analysis Tool (SGHAT) software, developed by Sandia Laboratories, now hosted by ForgeSolar. The SGHAT software is considered an industry-best practice and conservative model that effectively models the potential for glare at defined receptors from defined solar energy generating facilities.

Receptors & Methodology

Kimley Horn included as part of the analysis 14 observation points within one mile of the Project and six roadways adjacent or near the Project site. The observation points (OP) and roadway receptors used in the analysis were considered representative of other viewpoints of the proposed Project and were selected due to their similarity to other potential receptor locations throughout the site. The receptors for roadways were limited to a 50-degree field of view to the left and right simulating the extent of peripheral vision. Glare that is beyond 50 degrees to the left or right from the driver's line-of-sight is not considered a safety hazard. All receptors analyzed are listed below including route receptors, and observation points, see **Table 1**. The PV array was modeled with single axis tracking, smooth glass with anti-reflective coating, and shade backtracking. Due to the irregular layout of the panel arrays, the panels in the model were drawn to cover any cavities or extremities which generate more conservative glare results. See **Table 2** for more panel specifications. The panel, roadway and observation point specifications be found in **Appendix A**.

Receptors	Location	Description
Bloomster Hollow Road	Roadway passes through Project site	Analyzed northwest and southeast
Clermont Road	Roadway passes through Project site	Analyzed northwest and southeast
Irons Hollow Road	Roadway northwest of Project site	Analyzed northwest and southeast
Red Mill Brook Road	Roadway east of Project site	Analyzed east and west
US Route 6	Roadway west of Project site	Analyzed north and south
Warner Brook Road	Roadway west of Project site	Analyzed northwest and southeast
Observation Point 1	0.28 miles from nearest panel array	Single-family home
Observation Point 2	0.36 miles from nearest panel array	Single-family home
Observation Point 3	0.80 miles from nearest panel array	Single-family home
Observation Point 4	0.61 miles from nearest panel array	Single-family home
Observation Point 5	0.63 miles from nearest panel array	Single-family home
Observation Point 6	0.93 miles from nearest panel array	Single-family home
Observation Point 7	0.58 miles from nearest panel array	Single-family home
Observation Point 8	0.39 miles from nearest panel array	Single-family home
Observation Point 9	0.72 miles from nearest panel array	Single-family home
Observation Point 10	0.43 miles from nearest panel array	Single-family home
Observation Point 11	0.12 miles from nearest panel array	Single-family home
Observation Point 12	0.72 miles from nearest panel array	Single-family home
Observation Point 13	0.39 miles from nearest panel array	Single-family home
Observation Point 14	0.63 miles from nearest panel array	Single-family home

Table 1: Receptor Descriptions

Parameter	Value
Rotation Axis Height	12'
Axis Tracking	Single-axis rotation
Tracking Axis Orientation	180°
Max Tracking Angle	60°
Backtracking Strategy	Shade
Ground Coverage Ratio	0.35
Panel Material	Smooth glass with Anti-Reflective Coating
Resting Angle	60°

Table 2: Panel Specifications

Kimley Horn utilized the ForgeSolar Glare Gauge software tool to perform the glare analysis. If any receptor showed signs of glare, the tool calculated the retinal irradiance (brightness) and subtended angle (size divided by distance) of the glare source. By considering retinal irradiance and subtended angle, the analysis could predict ocular hazards ranging from low potential for temporary after-image to retinal burn. Based on the predicted retinal irradiance (intensity) and the subtended angle (size/distance) of the glare source to the receptor, the software categories glare into three levels shown by colors. The three glare levels are: "green" grade indicating a low potential for temporary after-image, "yellow" grade indicating the potential for temporary after-image, and "red" grade indicating the potential for retinal damage. For comparison, viewing the unfiltered sun is in the upper region of yellow glare near the red border, while solar panel glare tends to be on the border of green and yellow, approximately three orders of magnitude less than direct viewing of the sun. The three levels of glare were determined in "Ho, 2011". The different levels are displayed in **Figure 2**, with viewing unfiltered sun shown as a reference point. Green and yellow glare is common from bodies of water, glass facades, and solar panel arrays. Red glare is extremely rare for PV arrays because solar panels do not concentrate glare.

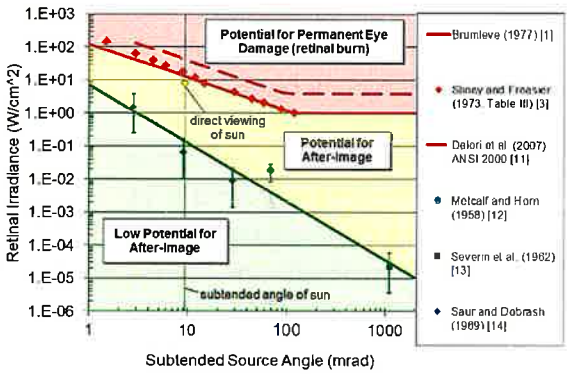


Figure 2: Glare Level Determined from "Ho, 2011"

According to the Federal Aviation Administration's (FAA) 2021 Final Policy, in previous years, pilots have reported glare from bodies of water and glass façades, resembling the glare produced by solar panels. The software analyzes pilot's similarly to motorists; therefore, results are like those found when analyzing pilots near bodies of water or existing building facades. Mitigating glare remains the focus, but it is not as significant an issue as initially thought in 2013 when the initial policy was formulated. The amount of light reflected by a surface, increases as the sunlight's angle of incidence from the surface increases as illustrated in **Figure 3**. The red angle of incidence yields 50% light reflected while the blue angle of incidence yields only two percent of light reflected.

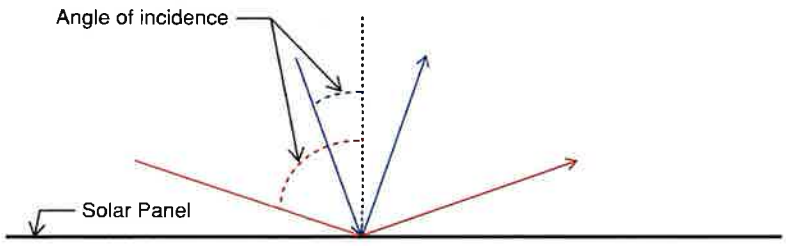


Figure 3: Reflected Light and Angle of Incidence (illustration only) on a panel

Analysis Results

The Project is not anticipated to produce any green, yellow or red glare. The tables below summarize the results for the observation points and routes. Glare is reflected in hours per year (8,760 in a regular, non-leap year) with time of day in standard time assuming clear skies, no existing topography, or manmade objects to block line of sight.

Observation Points

The observation points were modeled at a height of six feet to simulate an individual in a single-story building within one mile of the Project. All observation points observed no glare, see **Table 3.**

Receptor	Hazard Level	Hours (per year)
OP 1-14	Green	0
	Yellow	0
	Red	0

Table 3: Total Yearly Glare Hazard per Observation Point Receptors

Routes

The routes were modeled with a driver's height of five feet to simulate an individual in a sedan vehicle. All routes observed no glare, see **Table 4.**

Receptor	Hazard Level	Hours (per year)
Bloomster Hollow Road	Green	0
	Yellow	0
	Red	0
Clermont Road	Green	0
	Yellow	0
	Red	0
Irons Hollow Road	Green	0
	Yellow	0
	Red	0
Red Mill Brook Road	Green	0
	Yellow	0
	Red	0
US Route 6	Green	0
	Yellow	0
	Red	0
Warner Brook Road	Green	0
	Yellow	0
	Red	0

Table 4: Total Yearly Glare Hazard per Drive Path Receptors

Conclusion

In summary, there was no glare identified. The model is shown in the most conservative scenario assuming there is no terrain or man-made objects blocking the line of sight from the PV arrays and receptors. The panel specifications should resemble those shown in **Appendix A** to aim for the same results shown in this report.

APPENDIX A

ForgeSolar Glare Analysis Report

FORGESOLAR GLARE ANALYSIS

Project: **Stargazer Solar**
Site configuration: **Configuration 1**

Created 16 Dec, 2025
Updated 17 Dec, 2025
Time-step 1 minute
Timezone offset UTC-5
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 1 MW to 5 MW
Site ID 167251.27910

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV1	SA tracking	SA tracking	0	0.0	0	0.0	-
PV10	SA tracking	SA tracking	0	0.0	0	0.0	-
PV11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV14	SA tracking	SA tracking	0	0.0	0	0.0	-
PV15	SA tracking	SA tracking	0	0.0	0	0.0	-
PV16	SA tracking	SA tracking	0	0.0	0	0.0	-
PV17	SA tracking	SA tracking	0	0.0	0	0.0	-
PV18	SA tracking	SA tracking	0	0.0	0	0.0	-
PV19	SA tracking	SA tracking	0	0.0	0	0.0	-
PV2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV3	SA tracking	SA tracking	0	0.0	0	0.0	-
PV4	SA tracking	SA tracking	0	0.0	0	0.0	-
PV5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV6	SA tracking	SA tracking	0	0.0	0	0.0	-
PV7	SA tracking	SA tracking	0	0.0	0	0.0	-
PV8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV9	SA tracking	SA tracking	0	0.0	0	0.0	-

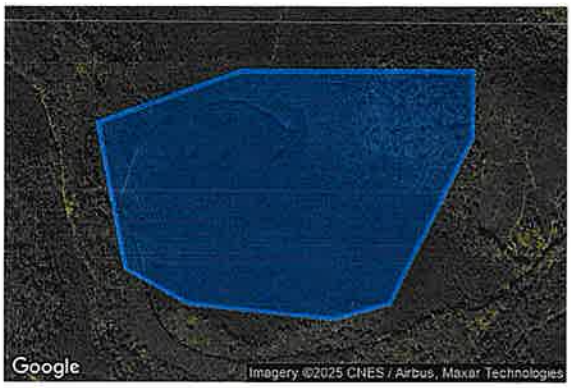
Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

Component Data

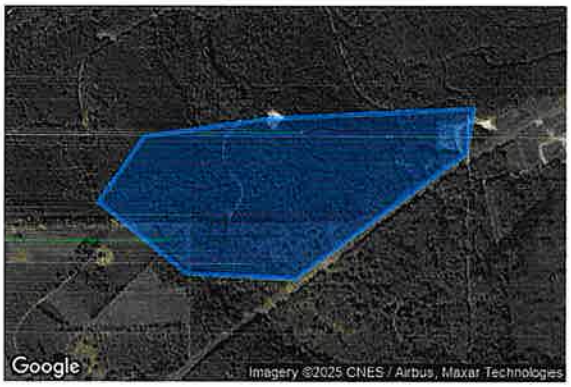
PV Arrays

Name: PV1
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.763080	-78.445665	2263.30	12.00	2275.30
2	41.763080	-78.453628	2314.00	12.00	2326.00
3	41.761765	-78.458539	2215.10	12.00	2227.10
4	41.758030	-78.457586	2183.50	12.00	2195.50
5	41.757141	-78.455393	2251.70	12.00	2263.70
6	41.756749	-78.450435	2215.20	12.00	2227.20
7	41.757140	-78.448528	2187.30	12.00	2199.30
8	41.761372	-78.445713	2220.90	12.00	2232.90
9	41.763080	-78.445665	2263.30	12.00	2275.30

Name: PV10
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.720872	-78.467798	2041.20	12.00	2053.20
2	41.720732	-78.464081	2011.10	12.00	2023.10
3	41.723938	-78.458208	2062.70	12.00	2074.70
4	41.725075	-78.457957	2056.70	12.00	2068.70
5	41.724823	-78.465012	2080.00	12.00	2092.00
6	41.724361	-78.469264	2089.40	12.00	2101.40
7	41.722689	-78.470819	2083.30	12.00	2095.30
8	41.720872	-78.467798	2041.20	12.00	2053.20

Name: PV11
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.719570	-78.460918	2021.30	12.00	2033.30
2	41.722608	-78.455172	2029.29	12.00	2041.29
3	41.723388	-78.455852	2019.00	12.00	2031.00
4	41.723265	-78.458098	2058.46	12.00	2070.46
5	41.719917	-78.464141	1987.86	12.00	1999.86
6	41.719570	-78.460918	2021.30	12.00	2033.30

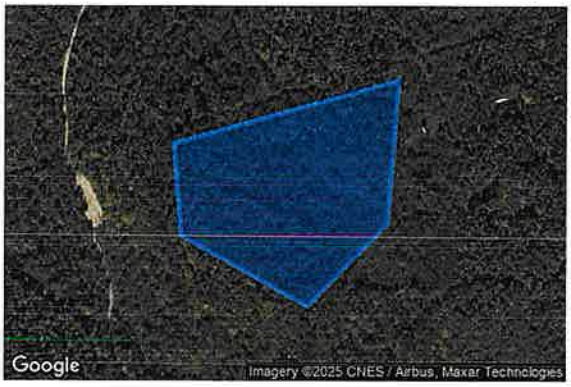
Name: PV12
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.718549	-78.460731	1970.20	12.00	1982.20
2	41.715627	-78.455985	1982.50	12.00	1994.50
3	41.716679	-78.451414	1947.30	12.00	1959.30
4	41.718569	-78.452877	1955.10	12.00	1967.10
5	41.720961	-78.453923	2014.00	12.00	2026.00
6	41.722539	-78.454363	2019.70	12.00	2031.70
7	41.719253	-78.460655	2004.70	12.00	2016.70
8	41.718549	-78.460731	1970.20	12.00	1982.20

Name: PV13
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

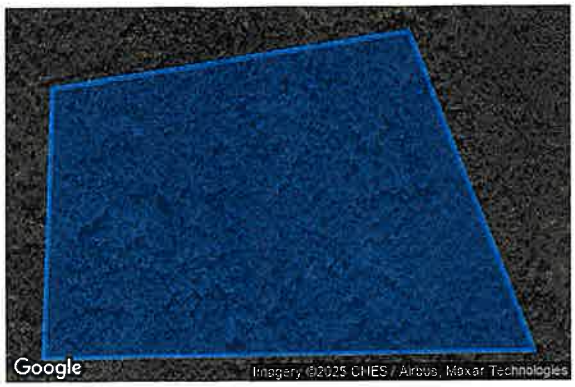
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.719770	-78.452361	1958.10	12.00	1970.10
2	41.719165	-78.451473	1976.00	12.00	1988.00
3	41.717618	-78.447345	1954.00	12.00	1966.00
4	41.720275	-78.431514	1943.80	12.00	1955.80
5	41.722622	-78.427544	1941.10	12.00	1953.10
6	41.725739	-78.427413	1972.20	12.00	1984.20
7	41.727196	-78.434497	1971.90	12.00	1983.90
8	41.728613	-78.436886	1976.90	12.00	1988.90
9	41.729802	-78.442423	1979.60	12.00	1991.60
10	41.726589	-78.447010	1977.80	12.00	1989.80
11	41.723243	-78.453074	1995.90	12.00	2007.90
12	41.719770	-78.452361	1958.10	12.00	1970.10

Name: PV14
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.716337	-78.445809	1950.00	12.00	1962.00
2	41.715441	-78.443644	1938.60	12.00	1950.60
3	41.716491	-78.442277	1922.80	12.00	1934.80
4	41.718327	-78.442083	1955.90	12.00	1967.90
5	41.717520	-78.445936	1967.20	12.00	1979.20
6	41.716337	-78.445809	1950.00	12.00	1962.00

Name: PV15
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

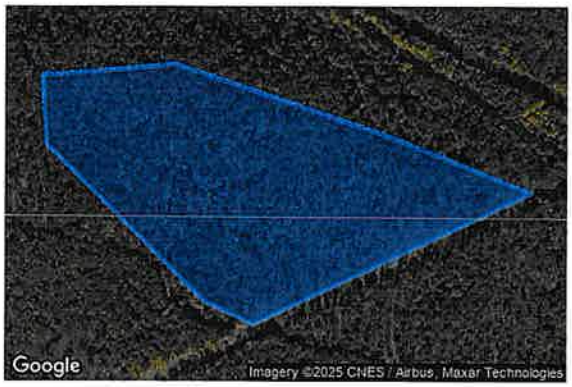


Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.715195	-78.441484	1906.20	12.00	1918.20
2	41.715268	-78.433102	1900.70	12.00	1912.70
3	41.719364	-78.435229	1959.60	12.00	1971.60
4	41.718644	-78.441322	1952.40	12.00	1964.40
5	41.715195	-78.441484	1906.20	12.00	1918.20

Name: PV16
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.715193	-78.432927	1891.90	12.00	1903.90
2	41.715211	-78.428411	1864.40	12.00	1876.40
3	41.717009	-78.426909	1853.30	12.00	1865.30
4	41.720152	-78.427704	1919.60	12.00	1931.60
5	41.719485	-78.434733	1959.70	12.00	1971.70
6	41.715193	-78.432927	1891.90	12.00	1903.90

Name: PV17
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

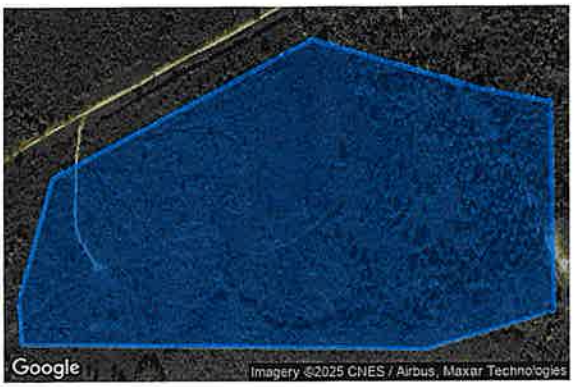


Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.702796	-78.512966	2111.70	12.00	2123.70
2	41.701907	-78.512883	2096.40	12.00	2108.40
3	41.699902	-78.510170	2096.80	12.00	2108.80
4	41.699613	-78.509339	2102.30	12.00	2114.30
5	41.701287	-78.504578	2088.60	12.00	2100.60
6	41.701990	-78.506931	2100.70	12.00	2112.70
7	41.702941	-78.510668	2114.80	12.00	2126.80
8	41.702796	-78.512966	2111.70	12.00	2123.70

Name: PV18
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.694944	-78.521907	2131.20	12.00	2143.20
2	41.693975	-78.522444	2108.60	12.00	2120.60
3	41.693710	-78.521695	2112.70	12.00	2124.70
4	41.693050	-78.517623	2132.30	12.00	2144.30
5	41.694659	-78.513702	2082.20	12.00	2094.20
6	41.696052	-78.513398	2054.90	12.00	2066.90
7	41.697611	-78.514694	2066.60	12.00	2078.60
8	41.697669	-78.520973	2149.60	12.00	2161.60
9	41.697263	-78.523260	2131.60	12.00	2143.60
10	41.697012	-78.523252	2125.80	12.00	2137.80
11	41.694944	-78.521907	2131.20	12.00	2143.20

Name: PV19
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

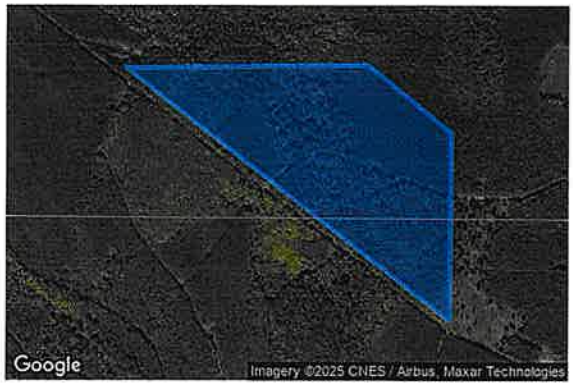


Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.690822	-78.518021	2115.90	12.00	2127.90
2	41.690265	-78.517961	2115.80	12.00	2127.80
3	41.690192	-78.511056	2089.20	12.00	2101.20
4	41.690674	-78.508901	2103.40	12.00	2115.40
5	41.693352	-78.508950	2091.50	12.00	2103.50
6	41.693503	-78.510047	2087.70	12.00	2099.70
7	41.694165	-78.513010	2077.10	12.00	2089.10
8	41.692392	-78.517435	2125.40	12.00	2137.40
9	41.690822	-78.518021	2115.90	12.00	2127.90

Name: PV2
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.762938	-78.466692	2288.90	12.00	2300.90
2	41.761836	-78.466978	2291.50	12.00	2303.50
3	41.759809	-78.465071	2278.50	12.00	2290.50
4	41.757248	-78.463879	2236.10	12.00	2248.10
5	41.755434	-78.460351	2252.00	12.00	2264.00
6	41.756572	-78.459779	2250.60	12.00	2262.60
7	41.763009	-78.460399	2227.00	12.00	2239.00
8	41.762938	-78.466692	2288.90	12.00	2300.90

Name: PV3
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.753336	-78.456824	2224.20	12.00	2236.20
2	41.746862	-78.445717	2174.20	12.00	2186.20
3	41.751663	-78.445668	2210.70	12.00	2222.70
4	41.753406	-78.448528	2174.30	12.00	2186.30
5	41.753336	-78.456824	2224.20	12.00	2236.20

Name: PV4
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.755647	-78.464070	2201.10	12.00	2213.10
2	41.754509	-78.463784	2185.40	12.00	2197.40
3	41.749175	-78.458302	2175.20	12.00	2187.20
4	41.746614	-78.454393	2077.90	12.00	2089.90
5	41.742096	-78.449484	2053.70	12.00	2065.70
6	41.742025	-78.447053	1999.00	12.00	2011.00
7	41.742594	-78.445909	2018.70	12.00	2030.70
8	41.744479	-78.445670	2115.40	12.00	2127.40
9	41.746257	-78.445765	2158.20	12.00	2170.20
10	41.756572	-78.463498	2229.70	12.00	2241.70
11	41.755647	-78.464070	2201.10	12.00	2213.10

Name: PV5
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.735754	-78.480632	2150.40	12.00	2162.40
2	41.735901	-78.477300	2120.40	12.00	2132.40
3	41.734489	-78.470389	2050.60	12.00	2062.60
4	41.731586	-78.465793	2009.30	12.00	2021.30
5	41.731147	-78.463698	1991.10	12.00	2003.10
6	41.730591	-78.456192	1978.50	12.00	1990.50
7	41.731234	-78.455198	1980.30	12.00	1992.30
8	41.733429	-78.451690	1946.90	12.00	1958.90
9	41.733370	-78.449710	1987.50	12.00	1999.50
10	41.735162	-78.449605	2004.90	12.00	2016.90
11	41.739564	-78.453522	2066.20	12.00	2078.20
12	41.743102	-78.456117	2092.60	12.00	2104.60
13	41.745822	-78.462056	2138.80	12.00	2150.80
14	41.750182	-78.466659	2230.20	12.00	2242.20
15	41.750303	-78.471078	2243.10	12.00	2255.10
16	41.751541	-78.473738	2245.60	12.00	2257.60
17	41.748254	-78.476928	2338.10	12.00	2350.10
18	41.738174	-78.480661	2184.00	12.00	2196.00
19	41.735754	-78.480632	2150.40	12.00	2162.40

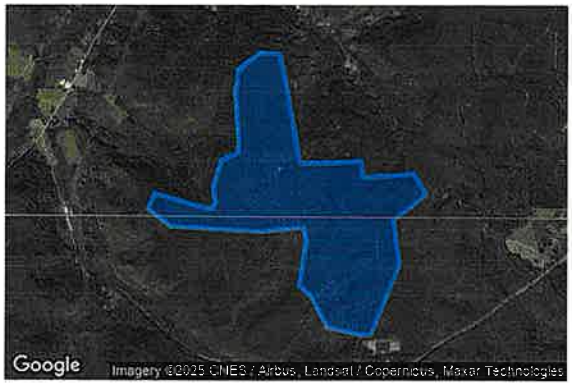
Name: PV6
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.725390	-78.488917	2058.60	12.00	2070.60
2	41.724820	-78.485975	2107.60	12.00	2119.60
3	41.734141	-78.482620	2164.40	12.00	2176.40
4	41.748017	-78.477457	2337.90	12.00	2349.90
5	41.754443	-78.477650	2288.70	12.00	2300.70
6	41.757668	-78.485650	2285.10	12.00	2297.10
7	41.753817	-78.487038	2304.10	12.00	2316.10
8	41.753143	-78.482586	2278.60	12.00	2290.60
9	41.747705	-78.485005	2252.50	12.00	2264.50
10	41.741881	-78.487779	2242.20	12.00	2254.20
11	41.738702	-78.493165	2215.30	12.00	2227.30
12	41.737093	-78.490681	2189.40	12.00	2201.40
13	41.732713	-78.488036	2142.90	12.00	2154.90
14	41.725390	-78.488917	2058.60	12.00	2070.60

Name: PV7
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.725372	-78.485184	2116.90	12.00	2128.90
2	41.723540	-78.484849	2120.30	12.00	2132.30
3	41.722568	-78.482659	2127.30	12.00	2139.30
4	41.722657	-78.477937	2032.20	12.00	2044.20
5	41.726676	-78.475241	1981.60	12.00	1993.60
6	41.728220	-78.474525	2031.80	12.00	2043.80
7	41.730604	-78.470490	2013.90	12.00	2025.90
8	41.730902	-78.470209	2018.40	12.00	2030.40
9	41.733716	-78.473123	2109.70	12.00	2121.70
10	41.734737	-78.474444	2122.20	12.00	2134.20
11	41.734978	-78.475928	2116.90	12.00	2128.90
12	41.734647	-78.481740	2154.30	12.00	2166.30
13	41.725372	-78.485184	2116.90	12.00	2128.90

Name: PV8
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.720319	-78.524179	2195.80	12.00	2207.80
2	41.719730	-78.511907	2228.60	12.00	2240.60
3	41.720208	-78.505945	2161.00	12.00	2173.00
4	41.718780	-78.505607	2140.70	12.00	2152.70
5	41.714155	-78.506534	2166.90	12.00	2178.90
6	41.713289	-78.505052	2162.70	12.00	2174.70
7	41.709998	-78.502697	2129.90	12.00	2141.90
8	41.709166	-78.498057	2105.00	12.00	2117.00
9	41.709232	-78.496729	2121.00	12.00	2133.00
10	41.716333	-78.492815	2166.80	12.00	2178.80
11	41.720910	-78.493652	2208.90	12.00	2220.90
12	41.722030	-78.491724	2162.90	12.00	2174.90
13	41.723559	-78.489252	2084.00	12.00	2096.00
14	41.725699	-78.490822	2098.60	12.00	2110.60
15	41.725474	-78.493923	2108.60	12.00	2120.60
16	41.725282	-78.497826	2165.50	12.00	2177.50
17	41.726965	-78.498110	2210.10	12.00	2222.10
18	41.726835	-78.500914	2247.10	12.00	2259.10
19	41.726706	-78.506505	2228.10	12.00	2240.10
20	41.735483	-78.508572	2222.00	12.00	2234.00
21	41.737957	-78.509387	2230.20	12.00	2242.20
22	41.738040	-78.512035	2277.90	12.00	2289.90
23	41.736347	-78.514968	2248.80	12.00	2260.80
24	41.733935	-78.515399	2173.80	12.00	2185.80
25	41.729018	-78.514900	2161.60	12.00	2173.60
26	41.727752	-78.514999	2183.60	12.00	2195.60
27	41.727137	-78.517200	2187.60	12.00	2199.60
28	41.724185	-78.518386	2167.30	12.00	2179.30
29	41.722759	-78.518092	2186.50	12.00	2198.50
30	41.722110	-78.518453	2210.80	12.00	2222.80
31	41.722110	-78.519248	2210.00	12.00	2222.00
32	41.723634	-78.526438	2222.30	12.00	2234.30
33	41.722038	-78.527385	2219.10	12.00	2231.10
34	41.720319	-78.524179	2195.80	12.00	2207.80

Name: PV9
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.35
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.716397	-78.492151	2164.50	12.00	2176.50
2	41.709297	-78.495902	2126.30	12.00	2138.30
3	41.709124	-78.494587	2141.70	12.00	2153.70
4	41.707478	-78.491881	2112.40	12.00	2124.40
5	41.707594	-78.488517	2076.90	12.00	2088.90
6	41.709037	-78.486197	2058.50	12.00	2070.50
7	41.711606	-78.486081	2070.90	12.00	2082.90
8	41.714607	-78.481905	2065.90	12.00	2077.90
9	41.721303	-78.482755	2117.90	12.00	2129.90
10	41.721707	-78.482677	2124.30	12.00	2136.30
11	41.722660	-78.484804	2141.90	12.00	2153.90
12	41.721419	-78.486196	2151.80	12.00	2163.80
13	41.720900	-78.489870	2119.00	12.00	2131.00
14	41.721650	-78.491223	2160.10	12.00	2172.10
15	41.720755	-78.493079	2201.60	12.00	2213.60
16	41.716397	-78.492151	2164.50	12.00	2176.50

Route Receptors

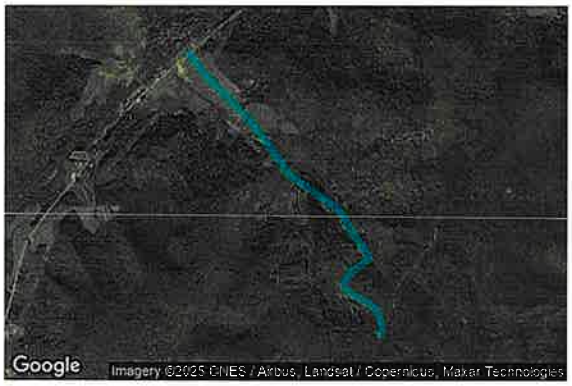
Name: Bloomster Hollow Road
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 0.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.748722	-78.526968	1592.97	5.00	1597.97
2	41.746857	-78.520595	1620.42	5.00	1625.42
3	41.745506	-78.518103	1629.97	5.00	1634.97
4	41.745138	-78.517148	1635.27	5.00	1640.27
5	41.744625	-78.515013	1642.82	5.00	1647.82
6	41.744289	-78.512159	1657.23	5.00	1662.23
7	41.743320	-78.509617	1683.46	5.00	1688.46
8	41.742784	-78.508672	1683.40	5.00	1688.40
9	41.741992	-78.505754	1700.04	5.00	1705.04
10	41.741423	-78.504456	1702.54	5.00	1707.54
11	41.740262	-78.502128	1727.56	5.00	1732.56
12	41.739854	-78.501570	1729.94	5.00	1734.94
13	41.738485	-78.500561	1739.82	5.00	1744.82
14	41.737076	-78.499789	1767.07	5.00	1772.07
15	41.735040	-78.498044	1826.25	5.00	1831.25
16	41.728944	-78.492740	1999.70	5.00	2004.70
17	41.727158	-78.492994	2036.08	5.00	2041.08
18	41.726846	-78.492844	2036.89	5.00	2041.89
19	41.726630	-78.491427	2059.59	5.00	2064.59
20	41.726053	-78.490419	2060.69	5.00	2065.69
21	41.724050	-78.488802	2071.74	5.00	2076.74
22	41.723313	-78.485297	2118.96	5.00	2123.96
23	41.722704	-78.483523	2131.37	5.00	2136.37
24	41.722271	-78.482886	2126.82	5.00	2131.82
25	41.719051	-78.478194	2106.44	5.00	2111.44
26	41.717718	-78.473693	2066.15	5.00	2071.15
27	41.716269	-78.473146	2037.36	5.00	2042.36
28	41.713410	-78.470818	2036.92	5.00	2041.92
29	41.710804	-78.467004	1970.65	5.00	1975.65
30	41.708021	-78.462010	1852.88	5.00	1857.88

Name: Clermont Road
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 0.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.729595	-78.542033	1621.08	5.00	1626.08
2	41.723830	-78.539652	1664.37	5.00	1669.37
3	41.716419	-78.536625	1709.83	5.00	1714.83
4	41.715122	-78.535681	1727.23	5.00	1732.23
5	41.714625	-78.534930	1723.53	5.00	1728.53
6	41.714061	-78.533933	1711.66	5.00	1716.66
7	41.713084	-78.531572	1713.44	5.00	1718.44
8	41.711882	-78.528397	1741.46	5.00	1746.46
9	41.708143	-78.522729	1820.66	5.00	1825.66
10	41.707278	-78.521119	1832.90	5.00	1837.90
11	41.706894	-78.519939	1828.90	5.00	1833.90
12	41.705900	-78.515047	1864.06	5.00	1869.06
13	41.704827	-78.510133	1957.14	5.00	1962.14
14	41.703794	-78.507944	1981.80	5.00	1986.80
15	41.702736	-78.506142	2010.53	5.00	2015.53
16	41.701855	-78.504254	2049.03	5.00	2054.03
17	41.701214	-78.502022	2092.84	5.00	2097.84
18	41.700862	-78.500348	2109.24	5.00	2114.24
19	41.700365	-78.498803	2105.67	5.00	2110.67
20	41.698106	-78.493589	2083.47	5.00	2088.47
21	41.695142	-78.486873	2118.91	5.00	2123.91
22	41.693652	-78.484749	2103.40	5.00	2108.40
23	41.691842	-78.482345	2041.32	5.00	2046.32

Name: Irons Hollow Road
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 0.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.782581	-78.498523	1547.15	5.00	1552.15
2	41.780933	-78.497063	1571.70	5.00	1576.70
3	41.779524	-78.495197	1597.85	5.00	1602.85
4	41.777244	-78.492150	1631.71	5.00	1636.71
5	41.775676	-78.490283	1635.71	5.00	1640.71
6	41.773932	-78.488373	1653.40	5.00	1658.40
7	41.771387	-78.485948	1654.40	5.00	1659.40
8	41.770250	-78.484927	1675.81	5.00	1680.81
9	41.769122	-78.482706	1692.75	5.00	1697.75
10	41.767457	-78.479552	1722.63	5.00	1727.63
11	41.766449	-78.477857	1740.03	5.00	1745.03
12	41.765897	-78.477288	1753.13	5.00	1758.13
13	41.764888	-78.476762	1781.77	5.00	1786.77
14	41.763800	-78.475657	1827.83	5.00	1832.83
15	41.762105	-78.474178	1885.04	5.00	1890.04
16	41.761673	-78.473867	1907.39	5.00	1912.39
17	41.761329	-78.474511	1917.40	5.00	1922.40
18	41.760304	-78.476388	1977.95	5.00	1982.95
19	41.759535	-78.477078	2007.11	5.00	2012.11
20	41.759103	-78.477357	2025.85	5.00	2030.85
21	41.758774	-78.477282	2027.44	5.00	2032.44
22	41.758222	-78.476574	2053.49	5.00	2058.49
23	41.757622	-78.475308	2096.81	5.00	2101.81
24	41.757037	-78.473818	2141.83	5.00	2146.83
25	41.756621	-78.473078	2166.64	5.00	2171.64
26	41.755483	-78.472327	2207.68	5.00	2212.68
27	41.754811	-78.472199	2231.84	5.00	2236.84
28	41.754419	-78.472091	2242.40	5.00	2247.40
29	41.754050	-78.472317	2257.70	5.00	2262.70

Name: Red Mill Brook Road
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 0.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.708941	-78.463473	1878.69	5.00	1883.69
2	41.711208	-78.460212	1849.52	5.00	1854.52
3	41.711721	-78.459139	1862.95	5.00	1867.95
4	41.711813	-78.458381	1862.38	5.00	1867.38
5	41.711757	-78.456214	1843.92	5.00	1848.92
6	41.712093	-78.455237	1837.79	5.00	1842.79
7	41.712083	-78.451945	1858.68	5.00	1863.68
8	41.712348	-78.450014	1846.49	5.00	1851.49
9	41.712364	-78.445197	1812.64	5.00	1817.64
10	41.712772	-78.444231	1793.60	5.00	1798.60
11	41.712948	-78.443019	1783.27	5.00	1788.27
12	41.712940	-78.440465	1781.28	5.00	1786.28
13	41.712039	-78.437735	1746.01	5.00	1751.01
14	41.712188	-78.436801	1741.32	5.00	1746.32
15	41.712240	-78.434816	1731.91	5.00	1736.91
16	41.712212	-78.434060	1734.08	5.00	1739.08
17	41.712256	-78.432708	1737.52	5.00	1742.52
18	41.712588	-78.431292	1750.00	5.00	1755.00
19	41.712625	-78.429893	1745.82	5.00	1750.82
20	41.712695	-78.428710	1736.51	5.00	1741.51
21	41.712733	-78.426748	1689.97	5.00	1694.97
22	41.712182	-78.424536	1677.37	5.00	1682.37
23	41.711730	-78.422621	1668.63	5.00	1673.63
24	41.710322	-78.417164	1654.47	5.00	1659.47

Name: US Route 6
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 0.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.720068	-78.553938	1665.88	5.00	1670.88
2	41.722823	-78.550354	1654.33	5.00	1659.33
3	41.724264	-78.548831	1653.22	5.00	1658.22
4	41.728627	-78.543018	1625.23	5.00	1630.23
5	41.732979	-78.539148	1629.97	5.00	1634.97
6	41.734819	-78.537771	1637.54	5.00	1642.54
7	41.739958	-78.534080	1656.62	5.00	1661.62
8	41.744869	-78.529623	1621.72	5.00	1626.72
9	41.746578	-78.528018	1596.19	5.00	1601.19
10	41.750564	-78.526108	1589.37	5.00	1594.37
11	41.755669	-78.523665	1628.42	5.00	1633.42
12	41.762840	-78.521026	1618.34	5.00	1623.34
13	41.763928	-78.520275	1617.48	5.00	1622.48
14	41.765305	-78.519031	1628.89	5.00	1633.89
15	41.770640	-78.513249	1575.66	5.00	1580.66
16	41.771818	-78.512035	1565.69	5.00	1570.69
17	41.774378	-78.509674	1549.99	5.00	1554.99
18	41.777931	-78.505748	1543.97	5.00	1548.97
19	41.784203	-78.495984	1562.32	5.00	1567.32
20	41.786811	-78.491779	1555.99	5.00	1560.99
21	41.788283	-78.488517	1537.19	5.00	1542.19
22	41.788315	-78.482488	1527.46	5.00	1532.46
23	41.788532	-78.481301	1533.71	5.00	1538.71
24	41.789657	-78.476413	1520.61	5.00	1525.61

Name: Warner Brook Road
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 0.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	41.732122	-78.539930	1626.37	5.00	1631.37
2	41.731214	-78.537817	1644.14	5.00	1649.14
3	41.731046	-78.537463	1650.62	5.00	1655.62
4	41.730561	-78.536985	1684.79	5.00	1689.79
5	41.730089	-78.536953	1682.78	5.00	1687.78
6	41.729304	-78.536819	1687.03	5.00	1692.03
7	41.728159	-78.536251	1690.24	5.00	1695.24
8	41.726971	-78.535629	1698.16	5.00	1703.16
9	41.726479	-78.535387	1702.18	5.00	1707.18
10	41.725618	-78.535178	1705.30	5.00	1710.30
11	41.723872	-78.534852	1715.43	5.00	1720.43
12	41.721835	-78.534530	1725.52	5.00	1730.52
13	41.720554	-78.534133	1733.27	5.00	1738.27
14	41.719272	-78.533286	1739.27	5.00	1744.27
15	41.718132	-78.532556	1744.85	5.00	1749.85
16	41.716378	-78.531805	1757.93	5.00	1762.93
17	41.715561	-78.531161	1759.66	5.00	1764.66
18	41.714744	-78.530046	1766.93	5.00	1771.93
19	41.712349	-78.524188	1794.61	5.00	1799.61
20	41.711965	-78.523479	1800.76	5.00	1805.76
21	41.711460	-78.523072	1806.82	5.00	1811.82
22	41.710748	-78.522975	1801.57	5.00	1806.57
23	41.710035	-78.523319	1802.45	5.00	1807.45
24	41.709306	-78.524456	1795.33	5.00	1800.33

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	41.700221	-78.499408	2106.76	6.00
OP 2	2	41.699779	-78.497866	2101.37	6.00
OP 3	3	41.687867	-78.493738	2101.22	6.00
OP 4	4	41.711690	-78.526775	1742.06	6.00
OP 5	5	41.719216	-78.539075	1744.74	6.00
OP 6	6	41.734038	-78.537920	1645.32	6.00
OP 7	7	41.745220	-78.517961	1637.36	6.00
OP 8	8	41.741224	-78.503297	1719.11	6.00
OP 9	9	41.768122	-78.485205	1725.80	6.00
OP 10	10	41.762189	-78.475081	1865.98	6.00
OP 11	11	41.714368	-78.457577	1887.47	6.00
OP 12	12	41.710565	-78.415795	1654.94	6.00
OP 13	13	41.717154	-78.473669	2053.60	6.00
OP 14	14	41.700936	-78.480224	2062.05	6.00

Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV1	SA tracking	SA tracking	0	0.0	0	0.0	-
PV10	SA tracking	SA tracking	0	0.0	0	0.0	-
PV11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV14	SA tracking	SA tracking	0	0.0	0	0.0	-
PV15	SA tracking	SA tracking	0	0.0	0	0.0	-
PV16	SA tracking	SA tracking	0	0.0	0	0.0	-
PV17	SA tracking	SA tracking	0	0.0	0	0.0	-
PV18	SA tracking	SA tracking	0	0.0	0	0.0	-
PV19	SA tracking	SA tracking	0	0.0	0	0.0	-
PV2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV3	SA tracking	SA tracking	0	0.0	0	0.0	-
PV4	SA tracking	SA tracking	0	0.0	0	0.0	-
PV5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV6	SA tracking	SA tracking	0	0.0	0	0.0	-
PV7	SA tracking	SA tracking	0	0.0	0	0.0	-
PV8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV9	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Bloomster Hollow Road	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV: PV1 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV1 and Route: Bloomster Hollow Road

No glare found

PV1 and Route: Clermont Road

No glare found

PV1 and Route: Irons Hollow Road

No glare found

PV1 and Route: Red Mill Brook Road

No glare found

PV1 and Route: US Route 6

No glare found

PV1 and Route: Warner Brook Road

No glare found

PV1 and OP 1

No glare found

PV1 and OP 2

No glare found

PV1 and OP 3

No glare found

PV1 and OP 4

No glare found

PV1 and OP 5

No glare found

PV1 and OP 6

No glare found

PV1 and OP 7

No glare found

PV1 and OP 8

No glare found

PV1 and OP 9

No glare found

PV1 and OP 10

No glare found

PV1 and OP 11

No glare found

PV1 and OP 12

No glare found

PV1 and OP 13

No glare found

PV1 and OP 14

No glare found

PV: PV10 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV10 and Route: Bloomster Hollow Road

No glare found

PV10 and Route: Clermont Road

No glare found

PV10 and Route: Irons Hollow Road

No glare found

PV10 and Route: Red Mill Brook Road

No glare found

PV10 and Route: US Route 6

No glare found

PV10 and Route: Warner Brook Road

No glare found

PV10 and OP 1

No glare found

PV10 and OP 2

No glare found

PV10 and OP 3

No glare found

PV10 and OP 4

No glare found

PV10 and OP 5

No glare found

PV10 and OP 6

No glare found

PV10 and OP 7

No glare found

PV10 and OP 8

No glare found

PV10 and OP 9

No glare found

PV10 and OP 10

No glare found

PV10 and OP 11

No glare found

PV10 and OP 12

No glare found

PV10 and OP 13

No glare found

PV10 and OP 14

No glare found

PV: PV11 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV11 and Route: Bloomster Hollow Road

No glare found

PV11 and Route: Clermont Road

No glare found

PV11 and Route: Irons Hollow Road

No glare found

PV11 and Route: Red Mill Brook Road

No glare found

PV11 and Route: US Route 6

No glare found

PV11 and Route: Warner Brook Road

No glare found

PV11 and OP 1

No glare found

PV11 and OP 2

No glare found

PV11 and OP 3

No glare found

PV11 and OP 4

No glare found

PV11 and OP 5

No glare found

PV11 and OP 6

No glare found

PV11 and OP 7

No glare found

PV11 and OP 8

No glare found

PV11 and OP 9

No glare found

PV11 and OP 10

No glare found

PV11 and OP 11

No glare found

PV11 and OP 12

No glare found

PV11 and OP 13

No glare found

PV11 and OP 14

No glare found

PV: PV12 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV12 and Route: Bloomster Hollow Road

No glare found

PV12 and Route: Clermont Road

No glare found

PV12 and Route: Irons Hollow Road

No glare found

PV12 and Route: Red Mill Brook Road

No glare found

PV12 and Route: US Route 6

No glare found

PV12 and Route: Warner Brook Road

No glare found

PV12 and OP 1

No glare found

PV12 and OP 2

No glare found

PV12 and OP 3

No glare found

PV12 and OP 4

No glare found

PV12 and OP 5

No glare found

PV12 and OP 6

No glare found

PV12 and OP 7

No glare found

PV12 and OP 8

No glare found

PV12 and OP 9

No glare found

PV12 and OP 10

No glare found

PV12 and OP 11

No glare found

PV12 and OP 12

No glare found

PV12 and OP 13

No glare found

PV12 and OP 14

No glare found

PV: PV13 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV13 and Route: Bloomster Hollow Road

No glare found

PV13 and Route: Clermont Road

No glare found

PV13 and Route: Irons Hollow Road

No glare found

PV13 and Route: Red Mill Brook Road

No glare found

PV13 and Route: US Route 6

No glare found

PV13 and Route: Warner Brook Road

No glare found

PV13 and OP 1

No glare found

PV13 and OP 2

No glare found

PV13 and OP 3

No glare found

PV13 and OP 4

No glare found

PV13 and OP 5

No glare found

PV13 and OP 6

No glare found

PV13 and OP 7

No glare found

PV13 and OP 8

No glare found

PV13 and OP 9

No glare found

PV13 and OP 10

No glare found

PV13 and OP 11

No glare found

PV13 and OP 12

No glare found

PV13 and OP 13

No glare found

PV13 and OP 14

No glare found

PV: PV14 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV14 and Route: Bloomster Hollow Road

No glare found

PV14 and Route: Clermont Road

No glare found

PV14 and Route: Irons Hollow Road

No glare found

PV14 and Route: Red Mill Brook Road

No glare found

PV14 and Route: US Route 6

No glare found

PV14 and Route: Warner Brook Road

No glare found

PV14 and OP 1

No glare found

PV14 and OP 2

No glare found

PV14 and OP 3

No glare found

PV14 and OP 4

No glare found

PV14 and OP 5

No glare found

PV14 and OP 6

No glare found

PV14 and OP 7

No glare found

PV14 and OP 8

No glare found

PV14 and OP 9

No glare found

PV14 and OP 10

No glare found

PV14 and OP 11

No glare found

PV14 and OP 12

No glare found

PV14 and OP 13

No glare found

PV14 and OP 14

No glare found

PV: PV15 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV15 and Route: Bloomster Hollow Road

No glare found

PV15 and Route: Clermont Road

No glare found

PV15 and Route: Irons Hollow Road

No glare found

PV15 and Route: Red Mill Brook Road

No glare found

PV15 and Route: US Route 6

No glare found

PV15 and Route: Warner Brook Road

No glare found

PV15 and OP 1

No glare found

PV15 and OP 2

No glare found

PV15 and OP 3

No glare found

PV15 and OP 4

No glare found

PV15 and OP 5

No glare found

PV15 and OP 6

No glare found

PV15 and OP 7

No glare found

PV15 and OP 8

No glare found

PV15 and OP 9

No glare found

PV15 and OP 10

No glare found

PV15 and OP 11

No glare found

PV15 and OP 12

No glare found

PV15 and OP 13

No glare found

PV15 and OP 14

No glare found

PV: PV16 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV16 and Route: Bloomster Hollow Road

No glare found

PV16 and Route: Clermont Road

No glare found

PV16 and Route: Irons Hollow Road

No glare found

PV16 and Route: Red Mill Brook Road

No glare found

PV16 and Route: US Route 6

No glare found

PV16 and Route: Warner Brook Road

No glare found

PV16 and OP 1

No glare found

PV16 and OP 2

No glare found

PV16 and OP 3

No glare found

PV16 and OP 4

No glare found

PV16 and OP 5

No glare found

PV16 and OP 6

No glare found

PV16 and OP 7

No glare found

PV16 and OP 8

No glare found

PV16 and OP 9

No glare found

PV16 and OP 10

No glare found

PV16 and OP 11

No glare found

PV16 and OP 12

No glare found

PV16 and OP 13

No glare found

PV16 and OP 14

No glare found

PV: PV17 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV17 and Route: Bloomster Hollow Road

No glare found

PV17 and Route: Clermont Road

No glare found

PV17 and Route: Irons Hollow Road

No glare found

PV17 and Route: Red Mill Brook Road

No glare found

PV17 and Route: US Route 6

No glare found

PV17 and Route: Warner Brook Road

No glare found

PV17 and OP 1

No glare found

PV17 and OP 2

No glare found

PV17 and OP 3

No glare found

PV17 and OP 4

No glare found

PV17 and OP 5

No glare found

PV17 and OP 6

No glare found

PV17 and OP 7

No glare found

PV17 and OP 8

No glare found

PV17 and OP 9

No glare found

PV17 and OP 10

No glare found

PV17 and OP 11

No glare found

PV17 and OP 12

No glare found

PV17 and OP 13

No glare found

PV17 and OP 14

No glare found

PV: PV18 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV18 and Route: Bloomster Hollow Road

No glare found

PV18 and Route: Clermont Road

No glare found

PV18 and Route: Irons Hollow Road

No glare found

PV18 and Route: Red Mill Brook Road

No glare found

PV18 and Route: US Route 6

No glare found

PV18 and Route: Warner Brook Road

No glare found

PV18 and OP 1

No glare found

PV18 and OP 2

No glare found

PV18 and OP 3

No glare found

PV18 and OP 4

No glare found

PV18 and OP 5

No glare found

PV18 and OP 6

No glare found

PV18 and OP 7

No glare found

PV18 and OP 8

No glare found

PV18 and OP 9

No glare found

PV18 and OP 10

No glare found

PV18 and OP 11

No glare found

PV18 and OP 12

No glare found

PV18 and OP 13

No glare found

PV18 and OP 14

No glare found

PV: PV19 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV19 and Route: Bloomster Hollow Road

No glare found

PV19 and Route: Clermont Road

No glare found

PV19 and Route: Irons Hollow Road

No glare found

PV19 and Route: Red Mill Brook Road

No glare found

PV19 and Route: US Route 6

No glare found

PV19 and Route: Warner Brook Road

No glare found

PV19 and OP 1

No glare found

PV19 and OP 2

No glare found

PV19 and OP 3

No glare found

PV19 and OP 4

No glare found

PV19 and OP 5

No glare found

PV19 and OP 6

No glare found

PV19 and OP 7

No glare found

PV19 and OP 8

No glare found

PV19 and OP 9

No glare found

PV19 and OP 10

No glare found

PV19 and OP 11

No glare found

PV19 and OP 12

No glare found

PV19 and OP 13

No glare found

PV19 and OP 14

No glare found

PV: PV2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV2 and Route: Bloomster Hollow Road

No glare found

PV2 and Route: Clermont Road

No glare found

PV2 and Route: Irons Hollow Road

No glare found

PV2 and Route: Red Mill Brook Road

No glare found

PV2 and Route: US Route 6

No glare found

PV2 and Route: Warner Brook Road

No glare found

PV2 and OP 1

No glare found

PV2 and OP 2

No glare found

PV2 and OP 3

No glare found

PV2 and OP 4

No glare found

PV2 and OP 5

No glare found

PV2 and OP 6

No glare found

PV2 and OP 7

No glare found

PV2 and OP 8

No glare found

PV2 and OP 9

No glare found

PV2 and OP 10

No glare found

PV2 and OP 11

No glare found

PV2 and OP 12

No glare found

PV2 and OP 13

No glare found

PV2 and OP 14

No glare found

PV: PV3 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV3 and Route: Bloomster Hollow Road

No glare found

PV3 and Route: Clermont Road

No glare found

PV3 and Route: Irons Hollow Road

No glare found

PV3 and Route: Red Mill Brook Road

No glare found

PV3 and Route: US Route 6

No glare found

PV3 and Route: Warner Brook Road

No glare found

PV3 and OP 1

No glare found

PV3 and OP 2

No glare found

PV3 and OP 3

No glare found

PV3 and OP 4

No glare found

PV3 and OP 5

No glare found

PV3 and OP 6

No glare found

PV3 and OP 7

No glare found

PV3 and OP 8

No glare found

PV3 and OP 9

No glare found

PV3 and OP 10

No glare found

PV3 and OP 11

No glare found

PV3 and OP 12

No glare found

PV3 and OP 13

No glare found

PV3 and OP 14

No glare found

PV: PV4 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV4 and Route: Bloomster Hollow Road

No glare found

PV4 and Route: Clermont Road

No glare found

PV4 and Route: Irons Hollow Road

No glare found

PV4 and Route: Red Mill Brook Road

No glare found

PV4 and Route: US Route 6

No glare found

PV4 and Route: Warner Brook Road

No glare found

PV4 and OP 1

No glare found

PV4 and OP 2

No glare found

PV4 and OP 3

No glare found

PV4 and OP 4

No glare found

PV4 and OP 5

No glare found

PV4 and OP 6

No glare found

PV4 and OP 7

No glare found

PV4 and OP 8

No glare found

PV4 and OP 9

No glare found

PV4 and OP 10

No glare found

PV4 and OP 11

No glare found

PV4 and OP 12

No glare found

PV4 and OP 13

No glare found

PV4 and OP 14

No glare found

PV: PV5 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV5 and Route: Bloomster Hollow Road

No glare found

PV5 and Route: Clermont Road

No glare found

PV5 and Route: Irons Hollow Road

No glare found

PV5 and Route: Red Mill Brook Road

No glare found

PV5 and Route: US Route 6

No glare found

PV5 and Route: Warner Brook Road

No glare found

PV5 and OP 1

No glare found

PV5 and OP 2

No glare found

PV5 and OP 3

No glare found

PV5 and OP 4

No glare found

PV5 and OP 5

No glare found

PV5 and OP 6

No glare found

PV5 and OP 7

No glare found

PV5 and OP 8

No glare found

PV5 and OP 9

No glare found

PV5 and OP 10

No glare found

PV5 and OP 11

No glare found

PV5 and OP 12

No glare found

PV5 and OP 13

No glare found

PV5 and OP 14

No glare found

PV: PV6 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV6 and Route: Bloomster Hollow Road

No glare found

PV6 and Route: Clermont Road

No glare found

PV6 and Route: Irons Hollow Road

No glare found

PV6 and Route: Red Mill Brook Road

No glare found

PV6 and Route: US Route 6

No glare found

PV6 and Route: Warner Brook Road

No glare found

PV6 and OP 1

No glare found

PV6 and OP 2

No glare found

PV6 and OP 3

No glare found

PV6 and OP 4

No glare found

PV6 and OP 5

No glare found

PV6 and OP 6

No glare found

PV6 and OP 7

No glare found

PV6 and OP 8

No glare found

PV6 and OP 9

No glare found

PV6 and OP 10

No glare found

PV6 and OP 11

No glare found

PV6 and OP 12

No glare found

PV6 and OP 13

No glare found

PV6 and OP 14

No glare found

PV: PV7 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV7 and Route: Bloomster Hollow Road

No glare found

PV7 and Route: Clermont Road

No glare found

PV7 and Route: Irons Hollow Road

No glare found

PV7 and Route: Red Mill Brook Road

No glare found

PV7 and Route: US Route 6

No glare found

PV7 and Route: Warner Brook Road

No glare found

PV7 and OP 1

No glare found

PV7 and OP 2

No glare found

PV7 and OP 3

No glare found

PV7 and OP 4

No glare found

PV7 and OP 5

No glare found

PV7 and OP 6

No glare found

PV7 and OP 7

No glare found

PV7 and OP 8

No glare found

PV7 and OP 9

No glare found

PV7 and OP 10

No glare found

PV7 and OP 11

No glare found

PV7 and OP 12

No glare found

PV7 and OP 13

No glare found

PV7 and OP 14

No glare found

PV: PV8 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV8 and Route: Bloomster Hollow Road

No glare found

PV8 and Route: Clermont Road

No glare found

PV8 and Route: Irons Hollow Road

No glare found

PV8 and Route: Red Mill Brook Road

No glare found

PV8 and Route: US Route 6

No glare found

PV8 and Route: Warner Brook Road

No glare found

PV8 and OP 1

No glare found

PV8 and OP 2

No glare found

PV8 and OP 3

No glare found

PV8 and OP 4

No glare found

PV8 and OP 5

No glare found

PV8 and OP 6

No glare found

PV8 and OP 7

No glare found

PV8 and OP 8

No glare found

PV8 and OP 9

No glare found

PV8 and OP 10

No glare found

PV8 and OP 11

No glare found

PV8 and OP 12

No glare found

PV8 and OP 13

No glare found

PV8 and OP 14

No glare found

PV: PV9 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Bloomster Hollow Road	0	0.0	0	0.0
Clermont Road	0	0.0	0	0.0
Irons Hollow Road	0	0.0	0	0.0
Red Mill Brook Road	0	0.0	0	0.0
US Route 6	0	0.0	0	0.0
Warner Brook Road	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0

PV9 and Route: Bloomster Hollow Road

No glare found

PV9 and Route: Clermont Road

No glare found

PV9 and Route: Irons Hollow Road

No glare found

PV9 and Route: Red Mill Brook Road

No glare found

PV9 and Route: US Route 6

No glare found

PV9 and Route: Warner Brook Road

No glare found

PV9 and OP 1

No glare found

PV9 and OP 2

No glare found

PV9 and OP 3

No glare found

PV9 and OP 4

No glare found

PV9 and OP 5

No glare found

PV9 and OP 6

No glare found

PV9 and OP 7

No glare found

PV9 and OP 8

No glare found

PV9 and OP 9

No glare found

PV9 and OP 10

No glare found

PV9 and OP 11

No glare found

PV9 and OP 12

No glare found

PV9 and OP 13

No glare found

PV9 and OP 14

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

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

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

Exhibit 5

VSUN
Innovative & Smart

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30 YEAR
POWER OUTPUT GUARANTEE

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635W
Highest power output

23.51%
Module efficiency

1.0%
First-year degradation warranty

0.40%
Annual degradation over 30 years

KEY FEATURES

- TOPcon — TOPcon technology
- Higher output power
- MBB technology with Circular Ribbon
- Positive tolerance offer
- Bifacial cells, converting more sunlight into electricity
- Better shading tolerance
- Better temperature coefficient
- Excellent PID Resistance
- Lower LCOE
- UL 61730 & CSA 61730 IEC 61215 & IEC 61730

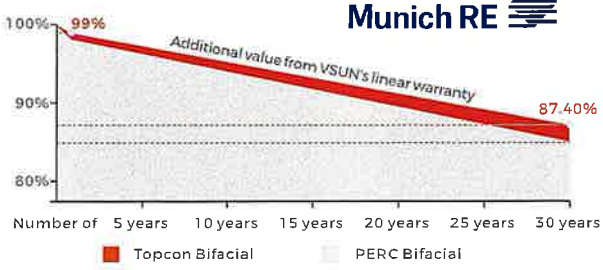
ABOUT VSUN

Invested by Fuji Solar, VSUN SOLAR is a solar solution provider with headquartered in Tokyo, Japan that offers reliability, high efficiency solar products and technology globally. VSUN is rated as BNEF Tier 1 PV module manufacturer, PVEL Lab "Best performer" and EcoVadis "Bronze Award".

PRODUCT CERTIFICATION

WARRANTY

Warranty partner Munich RE



Update Time: 2025.01.14
Version: 1.0

Electrical Characteristics at Standard Test Conditions(STC)

Module Type	VSUN635N-132BMHR-DG	VSUN630N-132BMHR-DG	VSUN625N-132BMHR-DG	VSUN620N-132BMHR-DG	VSUN615N-132BMHR-DG	VSUN610N-132BMHR-DG
Maximum Power - Pmax (W)	635	630	625	620	615	610
Open Circuit Voltage - Voc (V)	49.3	49.1	48.9	48.7	48.5	48.3
Short Circuit Current - Isc (A)	16.1	16.05	16	15.95	15.9	15.85
Maximum Power Voltage - Vmpp (V)	41.89	41.67	41.45	41.23	41.03	40.83
Maximum Power Current - Impp (A)	15.16	15.12	15.08	15.04	14.99	14.94
Module Efficiency	23.51%	23.32%	23.14%	22.95%	22.77%	22.58%

Standard Test Conditions (STC): irradiance 1,000 W/m²; AM 1,5; module temperature 25°C. Pmax Sorting : 0~5W. Measuring Tolerance: ±3%.
Remark: Electrical data do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

Electrical Characteristics with different rear side power gain(reference to 635 front)

Pmax (W)	Voc (V)	Isc (A)	Vmpp (V)	Impp (A)	Pmax gain
667	49.30	16.91	41.89	15.92	5%
699	49.30	17.71	41.89	16.68	10%
762	49.34	19.32	41.85	18.19	20%
794	49.34	20.13	41.85	18.95	25%

Material Characteristics

Dimensions	2382×1134×35mm (L×W×H) 93.78*44.65*1.38 inches (L×W×H)
Weight	41.6kg / 74.08lbs
Frame	Silver anodized aluminum profile
Front Glass	AR-coating Semi-toughened glass, 3.2mm
Back Glass	Glazed & Semi-toughened glass, 2.0mm
Cells	12×11 pcs mono solar cells series strings
Junction Box	IP68, 3 diodes
Cable	Potrait: +300mm/-400mm (cable length can be customized) , 1×4mm2 or 12AWG

System Design

Maximum System Voltage [V]	1500
Series Fuse Rating [A]	30
Bifaciality	80%±10%
Fire Rating	Class C for IEC and TYPE 29 for US
Protection Class	Class II
Temperature Range	-40 °C to + 85 °C
Maximum Surface Load	+5400/-2400 Pa +113/-50 psf
Application class	class A
Withstanding Hail	Maximum diameter of 25 mm with impact speed of 23 m/s

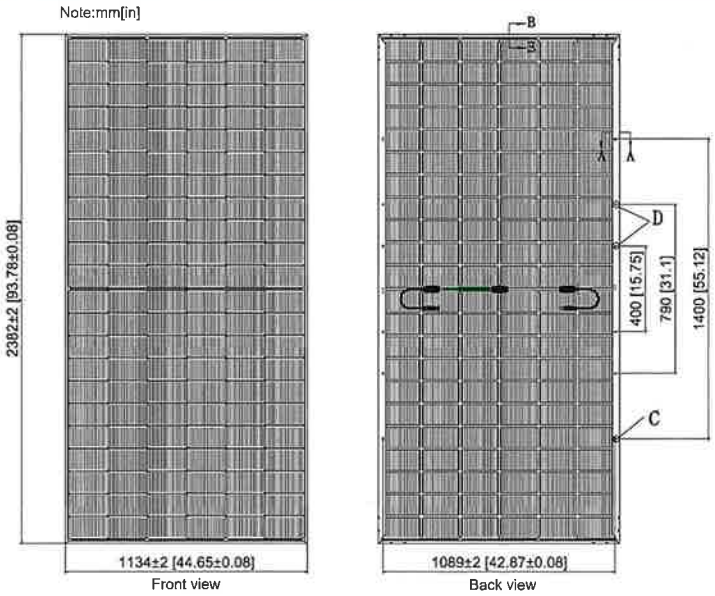
Packaging

Dimensions(L×W×H)	2395×1125×1253mm / 929*44.29*49.33inches
Quantity per pallet	31 pcs
Container 20'	/
Container 40'	/
Container 40'HC	434 for US special project

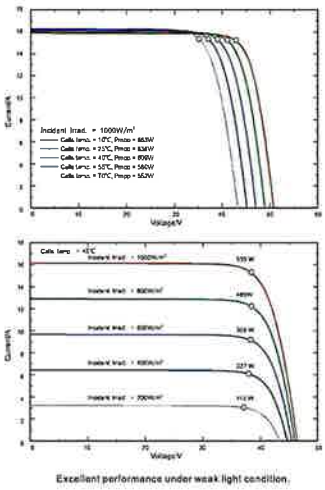
Temperature Characteristics

NOCT	45°C(±2°C)
Voltage Temperature Coefficient	-0.24%/°C
Current Temperature Coefficient	+0.04%/°C
Power Temperature Coefficient	-0.29%/°C

Dimensions



IV-Curves



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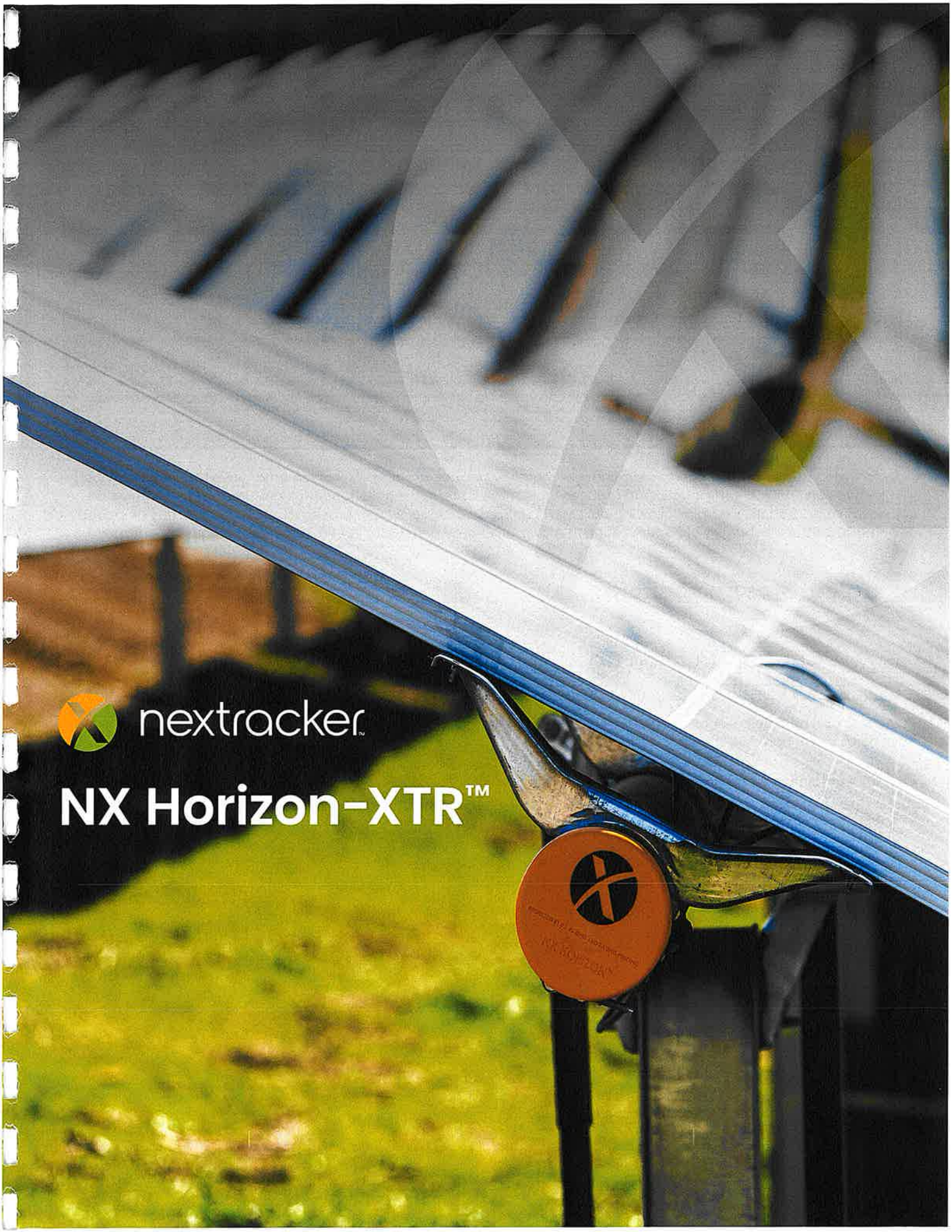
nextracker
NX Horizon-XTR™

By following native land contours to eliminate or massively reduce grading, NX Horizon-XTR™ saves construction cost, minimizes environmental impacts, and reduces project risk for terrain-challenged projects. Horizon-XTR features an innovative approach to terrain-following built on NX Horizon™ existing, 90 GW-proven technology, and may be paired with TrueCapture™ energy yield optimization to maximize energy generation for each project's unique topography.

Key Features and Benefits

Cut Construction Costs & Timeline

Grading can be time consuming and expensive.
NX Horizon-XTR can deliver up to:

- 100% grading reduction, cutting 1,000-3,000 cubic yards / MW of cut & fill
- 36" pile length reduction, saving 5,000-9,000 lbs / MW steel consumption
- 100% re-vegetation reduction, cutting 5 acres / MW of re-seeding

Minimize Environmental Impacts

Grading can be damaging to the local ecosystem.
NX Horizon-XTR helps protect the land by:

- Avoiding destruction of native topsoil and vegetation
- Preventing habitat disruption from non-native re-vegetation
- Preventing long-term soil erosion and storm runoff

We are seeing more and more projects these days having undulating terrain, and Horizon-XTR allows us to build up and over a hill, without having to flatten it out.

– Donny Gallagher
VP Engineering,
SOLV Energy

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Mitigate Project Risk

Grading introduces risks throughout the project lifecycle. NX Horizon-XTR helps mitigate by:

- Simplifying permitting, improving community acceptance, and mitigating topographic study inaccuracies during the development phase
- Avoiding grading related delays and cost overruns due to unforeseen conditions, inclement weather, and remediations during the construction phase
- Preventing escalating land maintenance and project remediations due to soil erosion during operations phase

Horizon-XTR allows us to decouple some of the earthwork that used to be mandatory and allows us to build the best structure for the land as it is now.

– Nick de Vries
SVP of Technology and Asset Management, Silicon Ranch

Based on Proven Technology

NX Horizon-XTR is based on NX Horizon's 90 GW-proven core architecture, uniquely suited for grade-following applications without the use of complex joints. Risks associated with other tracker technology may include:

- Loss of tracker row torsional stiffness
- Friction or binding of bearing components, wearing of articulating joints
- Complex drive mechanisms
- Limited track record

GENERAL AND MECHANICAL

Architecture	Horizontal single-axis, independent row, mechanically balanced
Configuration	1 x module in portrait
Tracking range of motion	±60° or ±50°
Row Size	Configurable per module type, string length and site layout
Drive type	High accuracy slew gear
Modules supported	All utility-scale crystalline and thin-film modules
Bifacial optimized design	High-rise mounting rails, bearing & driveline gaps, round torque tube
Materials	Galvanized steel; other coatings available
Structural connections	Engineered fastening system, vibration-proof
Wind protection	Intelligent wind stowing with symmetric damping system

ELECTRONICS AND CONTROLS

Solar tracking method	Astronomical algorithm with backtracking standard. TrueCapture™ available for enhanced energy yield
Tracker controller	Self-Powered Controller (SPC) with integrated inclinometer and UPS
Motor	Brushless DC
Power supply	Self-Powered: Standalone smart solar panel AC Powered Option: Customer-provided 120-277 VAC circuit
Site-level control & communications	Network control units (NCUs) at inverter pads/skids Self-powered weather stations Centralized data hub Encrypted Zigbee wireless mesh communications
Defensive stowing functions	Wind, hail, hurricane, snow, flood, loss of grid power
Operator interface	NX Navigator™ advanced HMI available, with SCADA integration

SITE CONDITIONS

N-S site slope	Up to 15%
N-S terrain following	Conformance to native land contours Angular tolerance configured to site conditions
E-W site slope	Up to 15%
Ground coverage ratio (GCR)	No specific limit. Typical range 25-45%
Operating temperature range	Self-Powered: -30°C to 55°C (-22°F to 131°F) AC Powered: -40°C to 55°C (-40°F to 131°F)
Wind speed	Configurable up to 240 kph (150 mph) 10m, 3-second gust
Snow load	Configurable up to 4800 Pa (100 psf) ground load
Flooding	Standard module elevation 1.3 to 1.8 m (4'3" to 5'10"). All drive & control components at torque tube elevation. Increased elevation available with additional engineering
Soils	Complete range of foundation solutions available

SERVICE, WARRANTY AND STANDARDS

Tracker engineering & PE stamped design package	Standard
Foundation engineering & PE stamped design package	Available
Onsite construction support & commissioning service	Available
Warranty	10-year structural, 5-year drive & controls standard Extended warranty available
Certifications	UL 2703, UL 3703, IEC 62817, CSA
Warranty	10-year structural, 5-year drive and control components
Codes and standards	UL 3703 / UL 2703 / IEC 62817

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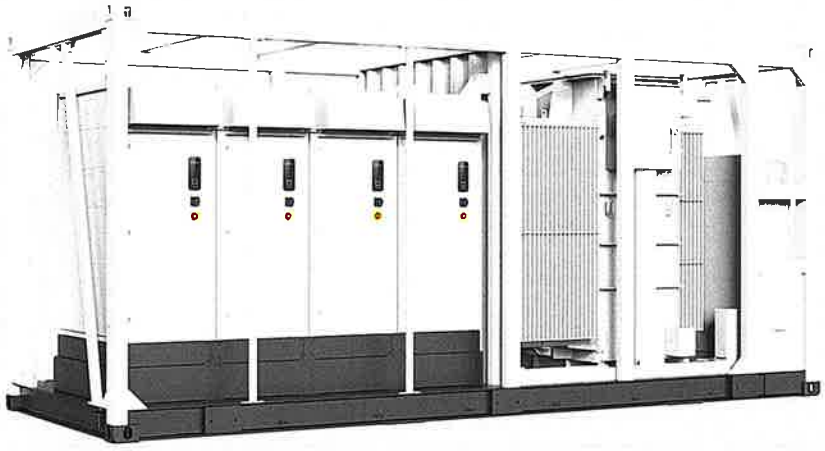
SG4400UD-MV-US

MV Grid-connected PV Inverter for 1500Vdc System



HIGH YIELD

- Advanced three-level technology
- Full power operation at 40 ℃ (104 ℉)
- Effective cooling, wide operation temperature

EASY O&M

- Integrated current, voltage and MV parameters monitoring function for online analysis and trouble shooting
- Modular design, easy for maintenance

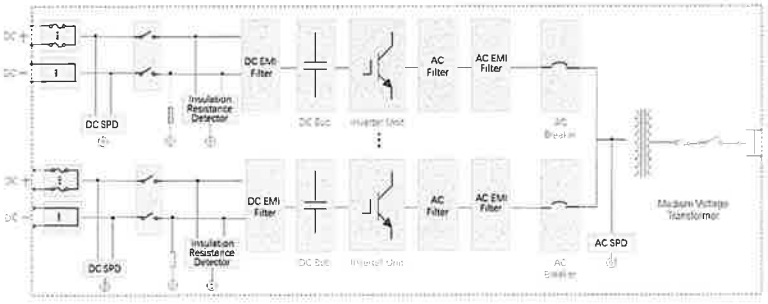
SAVED INVESTMENT

- Low transportation and installation cost due to 20-foot container size design
- DC 1500V system, low system cost
- Q at night

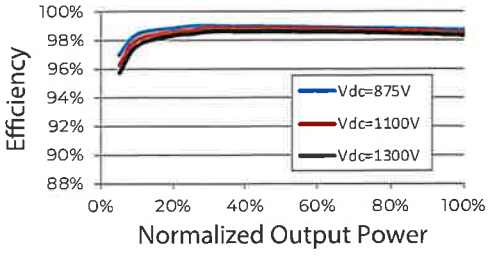
GRID SUPPORT

- Compliance with standards:UL 1741,UL 1741 SA/SB, IEEE 1547, Rule 21 and NEC code
- Low / High voltage ride through (L/HVRT), L/HFRT, soft start / stop
- Active & reactive power control and power ramp rate control

CIRCUIT DIAGRAM



EFFICIENCY CURVE



SUNGROW
Clean power for all

Type designation	SG4400UD-MV-US
Input (DC)	
Max. PV input voltage	1500 V
Min. PV input voltage / Start-up input voltage	915 V / 955 V
Available DC fuse sizes	250 A – 630 A
MPP voltage range	915 V – 1500 V
Full power MPP voltage range @ 40 ℃ [1]	915 V – 1337 V
No. of independent MPP inputs	4
No. of DC inputs	28 inputs negative grounding (optional: 24 inputs floating)
Max. PV input current	4 * 1226 A
Max. DC short-circuit current	4 * 3528 A
PV array configuration	Negative grounding or floating
Output (AC)	
AC output power	4400 kVA @ 40 ℃ (104 ℉) (Optional: 4400 kVA @ 45 ℃(113 ℉))
Max. AC output current	73 A
Nominal grid frequency / Grid frequency range	60 Hz / 57 Hz – 63 Hz
THD	< 3 % (at nominal power)
Power factor at nominal power / Ajustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Nominal AC voltage	34.5 kV
Efficiency	
Max. inverter unit efficiency	98.9 %
CEC inverter unit efficiency	98.5 %
Max. efficiency (including transformer)	98.2 %
CEC efficiency (including transformer)	97.5 %
Protection	
DC protection	DC load switch + fuse
AC protection	MV load switch + fuse
Surge protection	DC Type II / AC Type II
Grid monitoring / Ground fault monitoring	Yes / Yes
Insulation monitoring	Yes
Overheat protection	Yes
General data	
Dimensions (W * H * D)	6058 mm * 2896 mm * 2438 mm 238.5'' * 114.0'' * 96.0''
Weight	≤ 36376 lbs
Transformer vector	Dy1 (Optional: Dy11, Yny0, YNd1)
Degree of protection	NEMA 4X (Electronic enclosure) / NEMA 3R (Others)
Auxiliary power supply	5 kVA, 120 Vac ; Optional : 35 kVA 480 Vac + 5 kVA 120 Vac
Operating ambient temperature range [2]	-35 ℃ – 60 ℃ / optional: -40 ℃ – 60 ℃ -31 ℉ – 140 ℉ / optional: -40 ℉ – 140 ℉
Allowable relative humidity range	0 % - 100 %
Cooling method	Forced air cooling + KNAN (Optional: ONAN)
Max. Operating altitude	1000 m (Standard) / > 1000 m (Customized) (3280.8 ft (Standard) / > 3280.8 ft (Customized))
Display	LED Indicators , Ethernet + WebHMI
Night reactive power function	Yes
DC-Coupled storage interface	Optional
Charging power from the grid	Optional
Communication	Standard: RS485, Ethernet
Compliance	UL1741, UL62109-1, CSA C22.2 No.107.1-16, IEEE1547-2018, IEEE1547.1-2020, UL1741 SA/SB, California Rule21, HECO SRD V2.0, NEC 2023,PRC-024

1) Full power MPP range is temperature dependent, check the characteristic curve of the inverter for more information.
2) The ambient temperature is determined as the average temperature obtained from at least four evenly distributed temperature monitoring points located at a distance of 1 meter from the equipment, at a height halfway up the machine. The temperature sensors must be shielded from airflow, thermal radiation, and rapid temperature fluctuations to prevent display inaccuracies.

Exhibit 6

Decommissioning Plan

Stargazer Solar

Hamlin, Sargeant, and Norwich Townships

McKean County, PA

Prepared for:

RWE Clean Energy

1401 E 6th St, Suite 400

Austin, TX 78702

112647000
Original – 01/20/2026
50 S 16th Street, Suite 3300
Philadelphia, PA 19102
267-687-0150

Tom Katelhon, P.E.

Kimley»Horn

Kimley»Horn

January 20, 2026

Stargazer Solar: Decommissioning Plan
Kimley-Horn #112647000

This document entitled Stargazer Solar: Decommissioning Plan, was prepared by Kimley-Horn and Associates, Inc. ("Consultant") for the use of RWE Clean Energy ("RWE"), its successors and assigns, and the applicable regulatory agencies. Any reliance on this document by any other third party is strictly prohibited. The material in this document reflects Kimley-Horn's professional judgment of the scope, schedule, and other limitations stated in the document and in the contract between Consultant and RWE. Quantities for the estimate of decommissioning cost were estimated using the Electrical and Civil CAD files dated 12/08/2025. The opinions in this document are based on conditions and information existing at the time this document was published and do not consider any subsequent changes. The Consultant has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Consultant at this time and represent only the Consultant's judgment as a design professional familiar with the construction industry. The Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Kimley»Horn

Table of Contents

Kimley»Horn

1.0 Purpose

This decommissioning plan is provided by Kimley-Horn and Associates, Inc. (the "Project Company") and will detail the projected decommissioning demands associated with the proposed project.

The purpose of this decommissioning plan is to provide procedures and an opinion of probable construction cost for partial or full closure of the solar facility. Hamlin Township and Sargeant Township Solar Ordinances require an estimate of the total cost of decommissioning to supplement plans submitted as part of a solar permit application. This Decommissioning Plan ("Plan") details provisions for facility deconstruction and site restoration and shall take effect upon facility abandonment, discontinuation of operation, or expiration of the use permit.

When properly maintained and operated, community solar projects are expected to have a useful life of 25 to 40 years or more with equipment replacement and repowering. At the end of the Project's useful life, the decommissioning contractor shall take reasonable measures to ensure that all Project components that have a recycle value are recycled. Components of the Project that have resale value may be sold. As a last resort, metals and components that have no resale value should be recycled, sold as scrap, or disposed of at an approved licensed solid waste disposal facility.

2.0 Site Location

RWE proposes to build a photovoltaic (PV) power generation and BESS facility ("Solar Facility") with a nameplate capacity of approximately 480 MW_{AC} in Hamlin, Sargeant, and Norwich Townships, McKean County, PA ("Project"). The Project consists of eight (8) parcels identified by tax parcel numbers 23-005-103, 23-012-100, 23-012-101, 27-006-100, 29-001-104, 29-002-100, 29-002-300, and 29-003-100 ("Property") whose land is traversed by State Route 146 and Township Road 321. The Project is expected to use approximately 3,515 acres of the Property.

3.0 Project Components

Unless the system is purchased by another entity, the Solar Facility shall be decommissioned in accordance with this Plan. Decommissioning responsibilities involves removal of the Solar Facility and restoring the site as stated within the ordinance requirements. Other Plan activities include the management of materials and waste and projected costs. Based on the preliminary site plan at the time of the preparation of this Plan, the Project will consist of:

- Solar modules, trackers, and tracker motors
- Horizontal racking system on structural steel piles
- Inverters and transformers on concrete footings or pads
- Project owned substation
- Battery storage units and associated shells
- Combiner boxes, control system apparatuses, and weather monitoring systems
- Perimeter fencing
- Gravel access drive sections and foundations to a depth of thirty-six (36) inches
- Underground and overhead cables and lines

Kimley»Horn

Solar Facility equipment buried more than thirty-six (36) inches below grade does not require removal. Estimated quantities of materials for decommissioning and restoration are shown in Exhibits A and B.

4.0 Commencement of Decommissioning

This Plan assumes that the Solar Facility will be decommissioned under any of the following conditions:

1. Abandonment or discontinuation of operation such that the system does not produce power for sale for a consecutive twelve (12) month period, except in the instance of a force majeure event in which the Project is being repaired and/or restored.
2. The land lease (including the exercise of any extension options) ends and will either not be renewed or a new lease will not be entered for the Project within twelve (12) months.
3. The Project is damaged and will not be repaired or replaced.

5.0 Decommissioning Sequence

To decommission the Solar Facility, the Plan will include at a minimum:

- Acquisition of all necessary permits from applicable regulatory agencies.
- Disconnection from the utility power grid and de-energization of the Project.
- Preparation of laydown areas.
- Installation of perimeter erosion control.
- Removal of all Solar Facility components: panels, inverters, wire, cable, combiner boxes, transformers, racks, trackers, tracker motors, weather monitoring, security fencing, landscape buffers, control system apparatuses, battery storage units, BESS shells, buildings, etc.
- Removal of all foundations (to a depth of thirty-six (36) inches), concrete pads, conduit, and cabling.
- Removal of the access drive section and geogrid, de-compaction of soils (if applicable), and tilling and rough grading of soil, unless otherwise specified by the landowner.
- Restoration and revegetation of disturbed areas per the ordinance requirements to the extent practicable.

A significant number of components of the system will include recyclable and/or re-sellable components, and any materials to be disposed of will be handled and disposed of in accordance with all applicable laws and regulations. The decommissioning process will maximize the recycling, reuse and salvage of applicable Solar Facility components, which are outlined in the opinion of probable construction costs. If required, prior to beginning deconstruction activities, the decommissioning contractor will submit applicable demolition and construction plans and permit applications outlining the schedule, decommissioning sequencing, and any other details requested by applicable regulatory agencies. Decommissioning activities shall not begin prior to the issuance of approved permits by applicable regulatory agencies with appropriate jurisdiction.

This Plan is based on current best management practices and procedures. At the discretion of the Owner at the time of decommissioning, this Plan may be subject to revision based on new standards

and emergent best management practices at the time of decommissioning. Permits will be obtained as required and notification will be distributed to relevant stakeholders prior to decommissioning.

6.0 Restoration of Property

At the time of decommissioning, the Owner or operator will restore the Solar Facility to a grassed or meadow-like condition, active timberland, or another form that is acceptable to the property owners. All waste and excess materials will be disposed of in accordance with municipal, state, county, and federal regulations. Waste that can be recycled under municipal programs will be recycled accordingly. The Owner or operator shall not be required to replace any structures or infrastructure that were removed to construct the project.

The restoration will consist of de-compaction of the topsoil by disking or tilling and re-vegetation of the Property. The Project area will be seeded and fertilized with native or naturalized vegetation as needed to return the site to as close as practicable per the ordinance requirements. The future use of the land will be determined at the time of decommissioning, and deciding factors will be influenced by property owners, Township and County lrand use, and comprehensive plans and regulations pertinent at the time of decommissioning.

The Owner or operator will coordinate with the applicable regulatory agency to monitor vegetation and drainage following restoration until permanent vegetation is established. Erosion and sediment control, re-seeding, soil stabilization, weed control, and fertilization will be provided by the Owner or operator as needed until the site is approved to be stabilized by applicable regulatory agencies.

7.0 Party Responsible for Decommissioning

The Owner or operator is responsible for this decommissioning, provided however that they may contract with a third-party to perform the decommissioning on its behalf.

If neither the Facility Owner or Operator, nor the landowner complete decommissioning within the periods prescribed in section 8.0, then Sergeant Township may take such measures as necessary to complete decommissioning.

8.0 Time Period to Complete Decommissioning

The Owner or operator will have 12 months from the date decommissioning commences to complete decommissioning, provided, however, the Owner or operator shall be able to request an extension if it is in good faith diligently decommissioning and is delayed due to weather conditions or other items beyond its control.

Per the Sargeant Township Solar Ordinance, the owner of the Property shall have six (6) months to complete decommissioning if the Owner or operator fails to does so within the initial twelve (12) month allotment.

9.0 Decommissioning Cost Estimate

Kimley»Horn

An engineer's opinion of probable decommissioning cost and analysis of material salvage value were prepared as part of this Plan. Exhibit A summarizes the probable costs and salvage values associated with decommissioning. Exhibit B summarizes probable costs associated with decommissioning exclusive of salvage values.

Hamlin Township and Sargeant Township Solar Ordinances require the Project applicant to provide a performance bond based on estimated decommissioning costs as financial security for proper decommissioning. An independent and certified Professional Engineer shall be retained to estimate the total cost of decommissioning without regard to salvage value of the equipment, and the cost of decommissioning net salvage of the equipment. Said estimates shall be submitted to the Townships after the first year of operation. The opinion of probable decommissioning cost shall be updated every five (5) years to ensure the estimate is accurate and the performance bond is adequate.

Expenses associated with decommissioning the Project are dependent on labor costs at the time of decommissioning. For the purposes of this report, current RSMeans data was used to estimate labor, material, and equipment expenses.

The total probable cost of decommissioning in Year 40 is estimated to be **$100,766,741.38**.

10.0 Resale/Salvage Value Estimate

There is a robust secondary market for resale of solar PV panels worldwide and a network of facilities available for recycling panels. Solar PV panels are estimated to degrade by less than 0.5% per year, meaning they are expected to operate at 90% of capacity after 20 years. Panel manufacturers will guarantee the performance for each individual module and replace defective modules per the terms of warranty. Panels can therefore be sold for a price higher than their scrap value.

In general, the highest component value would be expected at the time of construction with declining value over the life of the Project. Over most of the Project's life, components such as the solar panels could be sold in the wholesale market for reuse or refurbishment. As panel efficiency and power production decrease due to aging and/or weathering, the resale value will decline accordingly. Secondary markets for used solar components include other utility scale solar facilities with similar designs that may require replacement equipment due to damage or normal wear over time; other buyers (e.g., developers, consumers) that are willing to accept slightly lower power output in return for a significantly lower price point compared to new equipment. The Solar Facility's additional supporting components, such as inverters, transformers, racking and piles, can be dismantled and resold for scrap value. Inverters and transformers are comprised of salvageable materials such as copper, aluminum, and silver. Piles and other steel components can likewise be recovered and salvaged. Resale values at the end of Year 5 for equipment of significant value were calculated with straight-line depreciation after an instant depreciation of the original material cost.

A current sampling of reused solar panels indicates a wide range of pricing depending on age and condition ($0.01 to $0.50 per watt). Future pricing of solar panels is difficult to predict currently, due to the relatively young age of the market, changes to solar panel technology, and the ever-increasing product demand. A conservative estimate of the value of solar panels in Year 40 at $0.01 per watt

would yield approximately $5,819,619.91. Increased costs of removal, for resale versus salvage, would be expected to preserve the integrity of the panels; however, the net revenue would still be substantially higher than the estimated salvage value.

The resale value of components such as trackers may decline more quickly; however, the salvage value of the steel that makes up a larger portion of the racking is expected to stay at or above the value used in this report. Salvage values of the various metal components were estimated using current scrap metal prices for steel, copper, and aluminum obtained from current local salvage rates.

The price used to value steel in this report is $147.86 per ton. The price used to value copper in this report is $2.80 per lb.

No salvage value was included in this Plan for the battery energy storage system components, however, may be contemplated in future versions of this report.

The total probable value of decommissioning including salvage value in Year 1 is estimated to be **$43,939,098.70.**

11.0 Decommissioning Bonding Procedure

Decommissioning Bond shall be posted with the appropriate or superseding authority, whether that be the Township, County, or other governmental or municipal authority or agency. The Facility Owner and Operator shall post and maintain Decommissioning Funds in an amount equal to Net Decommissioning Costs; provided, that at no point shall Decommissioning Funds be less than seventy-five percent (75%) of Decommissioning Costs. The Decommissioning Funds shall be posted and maintained with a bonding company or Federal or Commonwealth chartered lending institution chosen by the Facility Owner or Operator and participating landowner posting the financial security, provided that the bonding company or lending institution is authorized to conduct such business within the Commonwealth and is approved by the Authority Having Jurisdiction.

Decommissioning Funds may be in the form of a performance bond, surety bond, letter of credit, corporate guarantee or other form of financial assurance as may be acceptable to the Authority Having Jurisdiction.

The escrow agent shall release the Decommissioning Funds when the Facility Owner and Operator has demonstrated and the municipality concurs that decommissioning has been satisfactorily completed, or upon written approval of the municipality in order to implement the decommissioning plan.

Kimley»Horn

EXHIBIT A – DECOMMISSIONING ESTIMATE WITH SALVAGE

Stargazer Solar
Hamlin, Sargeant, and Norwich Townships, McKean County, PA
Decommissioning Estimate Pro Forma w/ Salvage

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs. LS = Lump Sum, HR = Hours, EA = Each, LF = Linear Feet.

Item	Quantity	Unit	Unit Price	Total Salvage	Total Price (incl. markups)	Total Price
Mobilization	1	LS		$ -	$1,194,600.00	$ (1,194,600.00)
Supervision	200	HR	$112.00	$ -	$22,400.00	$ (22,400.00)
Temporary Facilities	1	LS		$ -	$147,470.00	$ (147,470.00)
Safety	1	LS		$ -	$99,900.00	$ (99,900.00)
Legal Expenses	1	LS		$ -	$26,170.00	$ (26,170.00)
General Liability Insurance	1	LS		$ -	$107,030.00	$ (107,030.00)
Contractor's G&A	1	LS		$ -	$202,170.00	$ (202,170.00)
SWPPP, Erosion Control Measures (Disturbed Area)	4,200	Ac	$800.00	$ -	$3,360,000.00	$ (3,360,000.00)
Seeding	285	Ac	$2,023.33	$ -	$576,648.48	$ (576,648.48)
Tilling 6" topsoil/scarifying access road and rough grading existing soil	285	Ac	$919.47	$ -	$262,048.95	$ (262,048.95)
Remove and Recycle Chainlink Fence	321,000	LF	$4.88	$ 132,896.57	$1,565,603.03	$ (1,432,706.46)
Disconnection and Demolition of Switchyard/Substation Equipment	2	EA	$162,239.82	$ 64,895.93	$324,479.64	$ (259,583.71)
Remove and Recycle AC Cables	50,000	LF	$0.79	$ 7,000.00	$39,474.31	$ (32,474.31)
Remove and Recycle DC Cables	23,567,528	LF	$0.16	$ 3,299,453.85	$3,839,772.68	$ (540,318.83)
Backfill AC and DC trenches	18,904,022	LF	$0.25	$ -	$4,752,195.26	$ (4,752,195.26)
Remove and Recycle Inverters/Transformers	127	EA	$319.12	$ 685,800.00	$40,528.24	$ 645,271.76
Remove and Recycle Photovoltaic Modules	1,134,162	EA	$5.25	$ 5,050,166.49	$5,954,350.50	$ (904,184.01)
Remove and Recycle Piles	160,086	EA	$5.15	$ 1,325,537.69	$824,442.90	$ 501,094.79
Remove and Recycle Support Assemblies	50,155,170	LB	$0.04	$ 3,707,971.72	$2,244,802.77	$ 1,463,168.95
Remove and Recycle BESS Batteries	130	EA	$674.13	$ -	$87,637.24	$ 87,637.24
Remove and Recycle BESS Shells	33	EA	$604.20	$ -	$19,938.67	$ 19,938.67
			Subtotal:	$ 14,273,722.25	$25,691,662.66	$ (11,202,788.60)
					CUP Contigency (25%)	$ (2,800,697.15)
					Inflation (2.9%/year):	$ (29,935,612.95)
					Total:	$ (43,939,098.70)

Notes:

1. A 10% civil and electrical layout was used to derive potential quantities for erosion and sediment control.
2. Labor productivity and unit rates were derived from RSMeans Online (Heavy Construction, 2025 data). The current Consumer Price Index was utilized to determine the inflation rate.
3. Labor, material, and equipment rates are based on the RSMeans City Cost Index (CCI) for Bradford, PA.
4. Material salvage values were based off of current US salvage exchange rates.
5. Equipment rental rates determined from RSMeans and/or local rental facilities.
6. Photovoltaic Module material salvage rate is based on straight-line depreciation of modules (-0.5% per year).
7. For PV Module Removal/Recycle labor and equipment costs are computed at present values, while salvage value is computed at depreciated values.
8. Material salvage values were determined using the most prevalent salvageable metal in each component. Copper Wire @ $0.14/LF (AC and DC Cables) and Steel @ $0.41/LF of fence, @ $0.52/pile, and @ $0.07/LB.
9. Inverter resale value is dependent on the assumption that all inverters will be decommissioned and resold half way through their useful life (every 5 years).

Kimley»Horn

EXHIBIT B – DECOMMISSIONING ESTIMATE WITHOUT SALVAGE

Stargazer Solar
Hamlin, Sargeant, and Norwich Townships, McKean County, PA
Decommissioning Estimate Pro Forma w/o Salvage

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs. LS = Lump Sum, HR = Hours, EA = Each, LF = Linear Feet.

Item	Quantity	Unit	Unit Price	Total Price
Mobilization	1	LS		$1,194,600.00
Supervision	200	HR	$112.00	$22,400.00
Temporary Facilities	1	LS		$147,470.00
Safety	1	LS		$99,900.00
Legal Expenses	1	LS		$26,170.00
General Liability Insurance	1	LS		$107,030.00
Contractor's G&A	1	LS		$202,170.00
SWPPP, Erosion Control Measures (Disturbed Area)	4,200	Ac	$800.00	$3,360,000.00
Seeding	285	Ac	$2,023.33	$576,648.48
Tilling 6" topsoil/scarifying access road and rough grading existing soil	285	Ac	$919.47	$262,048.95
Remove and Recycle Chainlink Fence	321,000	LF	$4.88	$1,565,603.03
Disconnection and Demolition of Switchyard/Substation Equipment	2	EA	$162,239.82	$324,479.64
Remove and Recycle AC Cables	50,000	LF	$0.79	$39,474.31
Remove and Recycle DC Cables	23,567,528	LF	$0.16	$3,839,772.68
Backfill AC and DC trenches	18,904,022	LF	$0.25	$4,752,195.26
Remove and Recycle Inverters/Transformers	127	EA	$319.12	$40,528.24
Remove and Recycle Photovoltaic Modules	1,134,162	EA	$5.25	$5,954,350.50
Remove and Recycle Piles	160,086	EA	$5.15	$824,442.90
Remove and Recycle Support Assemblies	50,155,170	LB	$0.04	$2,244,802.77
Remove and Recycle BESS Batteries	130	EA	$674.13	$87,637.24
Remove and Recycle BESS Shells	33	EA	$604.20	$19,938.67
			Subtotal:	$25,691,662.66
			CUP Contigency (25%)	$6,422,915.67
			Inflation (2.9%/year):	$68,652,163.06
			Total:	$100,766,741.38

Notes:
1. A 10% civil and electrical layout was used to derive potential quantities for erosion and sediment control.
2. Labor productivity and unit rates were derived from RSMeans Online (Heavy Construction, 2025 data). The current Consumer Price Index was utilized to determine the inflation rate.
3. Labor, material, and equipment rates are based on the RSMeans City Cost Index (CCI) for Bradford, PA.
4. Equipment rental rates determined from RSMeans and/or local rental facilities.

Exhibit 7

RWE

Stargazer Solar Project

A 480 MW solar project that will power over **77,000 homes** and strengthen McKean County's economy.

McKean County, Pennsylvania

The Potential of Solar Energy in McKean County

Solar projects deliver cost-effective energy and impactful economic growth for communities. Solar is a critical component of an all-of-the-above energy strategy that creates a stronger, more reliable energy grid for Pennsylvanians with less reliance on foreign sources.

Support for the Community

Millions of dollars are invested in local communities, including property tax payments, land payments, spending at local businesses, and other direct and indirect economic benefits.

Jobs for Pennsylvanians

Hundreds of construction jobs and multiple permanent full-time direct and indirect operations jobs will remain in McKean County through the life of the project.

Upgraded Services & Infrastructure

Solar projects provide revenue for local governments to improve infrastructure and public services such as roads, bridges, schools, and emergency services without increasing taxes.

Estimated Economic Benefits

$45 million

in new local tax revenue and township donations over the life of the project

>1,000 jobs

during construction and approximately 15-20 jobs in full-time operation

$20 million

in Smethport Area School District tax revenue

$28 million

in economic growth during construction in McKean County

Stargazer Solar Project Snapshot

Location: McKean County, Pennsylvania

The Stargazer Solar Project is expected to be constructed several miles south of Smethport, Pennsylvania. The project will be built on privately owned land.

Solar Energy Partner: RWE is the solar project developer, owner, and operator, meaning that it will maintain responsibility and ownership of solar projects over the course of their entire lifespan. From construction to decommission, RWE is committed to being a community partner.

Environmental Stewardship: As a renewable energy provider, RWE prides itself in harmonious development of energy projects that are as productive as they are protective of our natural environment. This means that RWE abides by all local, state, and federal environmental guidelines to ensure the safety and well-being of the natural environment in the surrounding area.

RWE is engaging community members to learn how to best serve the community and create the greatest possible benefits for McKean County.

Solar is a Great Neighbor

Low Visibility
Panels have a low visual impact, standing at most ~12 feet tall and hidden behind McKean County's natural ridges and hills.

No Noise
Solar panels don't produce any noise, ensuring local hunters, fishermen, and campers will not be disturbed.

Minimal Traffic
Upon project completion, solar projects require minimal maintenance and upkeep, keeping traffic to a minimum

Who We Are

RWE is the third-largest renewable energy company in the United States and operates over 70 MW across three projects in Pennsylvania. RWE's homegrown resources support American energy dominance and independence, while investing in rural communities. RWE focuses on providing high- quality jobs while strengthening domestic manufacturing and supporting the renaissance of American industry.

Scan QR code to learn more.

RWE

STARGAZER

ECONOMIC AND FISCAL CONTRIBUTION TO MCKEAN COUNTY AND THE STATE OF PENNSYLVANIA

Prepared for

RWE

MANGUM economics®

SEPTEMBER 2025

REVISED DECEMBER 2025

804-322-7777

MANGUMECONOMICS.COM

About Mangum Economics, LLC

Mangum Economics was founded in 2003 and since then, we have become known as a leader in industry analysis, economic impact assessment, policy and program evaluation, and economic and workforce strategy development. The Mangum Team specializes in producing objective and actionable quantitative economic research that our clients use for strategic decision making in a variety of industries and environments. We know that our clients are unique, and that one size does not fit all. As a result, we have a well-earned reputation for tailoring our analyses to meet the specific needs of specific clients, with a specific audience.

Most of our research falls into four general categories:

- **Energy:** The Mangum Team has produced analyses of the economic and fiscal impact of over 50 GW of proposed solar, wind, battery energy storage, and hydro projects spanning more than thirty states ranging from 1 MW to over 800 MW in capacity, including small-scale distributed facilities. Among those projects was Dominion's 2.6 GW Coastal Virginia Offshore Wind project off of Virginia Beach. In addition, the Mangum Team has also performed economic and fiscal impact analyses for the natural gas, nuclear, oil, and pipeline industries.
- **Economic Development and Special Projects:** The Mangum Team has performed hundreds of analyses of proposed economic development projects and existing entities including museums and tourist attractions, hospital systems, industrial development and mixed-use projects, and economic development regions. The Mangum Team has also authored multiple economic development plans and assessed the impacts of international trade and an overseas trade office.
- **Advanced Applied Technology:** The Mangum Team specializes in analyzing how advanced technology developments (like data centers, fiber networks, and advanced manufacturing plants) contribute to the state and local economies. We have worked with local governments, trade associations, developers, and operating firms across the country to show how investments in advanced critical infrastructure transform local economies across the country.
- **Policy Analysis:** The Mangum Team also has extensive experience in identifying and quantifying the intended and unintended economic consequences of proposed legislative and regulatory initiatives.

The Project Team

Martina Arel, M.B.A.
Director – Economic Development & Energy Research

Kai Amado
Research Analyst

A. Fletcher Mangum, Ph.D.
Founder and CEO

Table of Contents

Executive Summary

This report assesses the economic and fiscal contribution that the proposed Stargazer project would make to McKean County and to the state of Pennsylvania.

Stargazer is a proposed 480-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The project would be located east of US-6 and west of US-46 in McKean County, Pennsylvania. The actively used, fenced-in site would be approximately 3,225 acres.

The primary findings from the assessment are as follows:

Economic Contribution – Construction[1,2]

- Stargazer would support approximately 1,500 local and non-local construction jobs during a representative 12-month period.
- Stargazer would provide an estimated pulse of economic activity to McKean County during its construction phase supporting approximately:
  - 70 direct and 206 indirect and induced local jobs,
  - $16.3 million in associated local wages and benefits,
  - $41.4 million in local economic output, and
  - $0.9 million in local tax revenue (in 2025 dollars).
- Stargazer would provide an estimated pulse of economic activity to the state of Pennsylvania (including McKean County) during its construction phase supporting approximately:
  - 737 direct and 1,068 indirect and induced jobs,
  - $183.6 million in associated wages and benefits,
  - $439.0 million in economic output,
  - $6.8 million in local tax revenue[3], and
  - $10.0 million in state tax revenue (in 2025 dollars).

Economic Contribution – Ongoing Operations

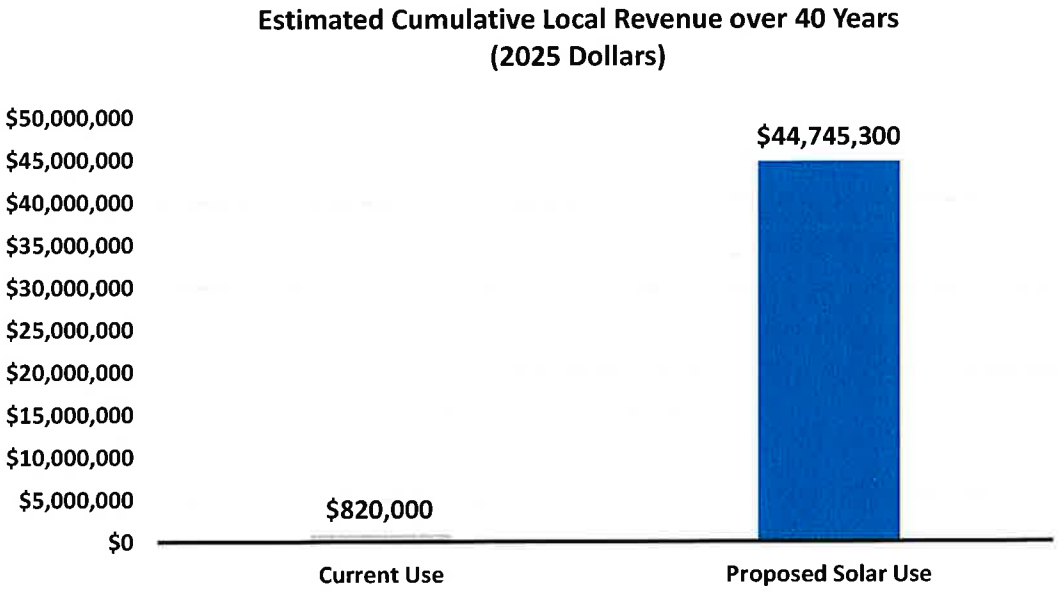
- Stargazer would provide an estimated annual economic impact to McKean County during its ongoing operational phase supporting approximately:
  - 10 direct and 9 indirect and induced local jobs,
  - $1.6 million in associated local wages and benefits, and
  - $5.2 million in local economic output (in 2025 dollars).

[1] Construction sector jobs are not necessarily new jobs, but the investments made can also support a job during the construction of the project. Please note it is not possible to know with certainty what proportion of jobs would go to county or state construction contractors or be filled by county or state residents.
[2] One construction job equals one person working full-time for one year. Since construction schedules and daily on-site employment vary, the analysis converts these variations into a consistent, full-time job.
[3] Local tax revenue includes collections from all local taxing jurisdictions within the state benefiting from the project.

- Stargazer would provide an estimated annual economic impact to the state of Pennsylvania (including McKean County) during its ongoing operational phase supporting approximately:
  - 10 direct and 17 indirect and induced jobs,
  - $2.3 million in associated wages and benefits, and
  - $6.9 million in economic output (in 2025 dollars).

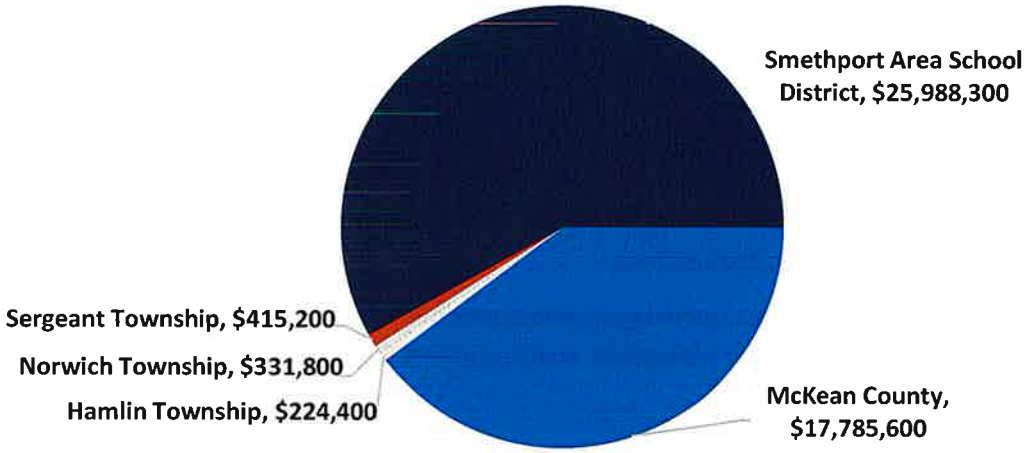
Fiscal Contribution

- Assuming revenues are generated from real estate taxes including rollback taxes, Stargazer would generate approximately $44.7 million in cumulative local revenue over the facility's anticipated 40-year operational life (in 2025 dollars).
- In its current use, the property would generate approximately $0.8 million in cumulative local revenue over a 40-year period – Stargazer would provide a 55-fold increase over current revenues respectively (in 2025 dollars).



- The estimated $44.7 million in cumulative local revenue consists of approximately:
  - $17.8 million in McKean County tax revenue,
  - $0.2 million in Hamlin Township tax revenue,
  - $0.3 million in Norwich Township tax revenue,
  - $0.4 million in Sergeant Township tax revenue, and
  - $26.0 million in Smethport Area School District (SD) tax revenue (in 2025 dollars).

Estimated Cumulative Local Revenue over 40 Years from Stargazer by Source (2025 Dollars)



Total: $44,745,300

Relative Comparisons

- The estimated annual McKean County tax revenue of approximately $435,400 would make Stargazer the highest property taxpayer in McKean County (in 2025 dollars).[4]
- Stargazer would provide more than twice as much revenue as the county currently collects annually from its highest taxpayer, Zippo Manufacturing Company, and more than three times as much revenue as the county's remaining taxpayers.[5]

Stargazer would provide a boost to McKean County's construction sector:

- At 567 jobs, construction is McKean County's sixth largest major industry sector.[6]
- Additionally, the construction sector experienced a gain of approximately 27 jobs between 2023 and 2024.[7]
- Stargazer would directly support approximately 70 jobs and $9.3 million in wages and benefits in McKean County's construction sector (in 2025 dollars).

[4] Please note the comparison is based on the estimated tax revenue collected by the McKean County taxing jurisdiction only. It excludes revenue generated by the other taxing jurisdictions.
[5] Derived from data provided by McKean County's GIS property record database. Current estimated tax revenues account for all parcels owned by the associated businesses. Totals may vary if parcel ownership is recorded under other entity names.
[6] Data Source: U.S. Bureau of Labor Statistics.
[7] Data Source: U.S. Bureau of Labor Statistics.

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The estimates provided in this report are based on the best information available and all reasonable care has been taken in assessing the quality of that information. However, because these estimates attempt to foresee the consequences of circumstances that have not yet occurred, it is not possible to be certain that they will be representative of actual events. These estimates are intended to provide a good indication of likely future outcomes and should not be construed to represent a precise measure of those outcomes.

Introduction

This report assesses the economic and fiscal contribution that the proposed Stargazer project would make to McKean County and to the state of Pennsylvania. This report was commissioned by RWE Clean Energy (RWE) and produced by Mangum Economics.

The Project

Stargazer is a proposed 480-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The project would be located east of US-6 and west of US-46 in McKean County, Pennsylvania. The actively used, fenced-in site would be approximately 3,225 acres.

Electricity Production in Pennsylvania

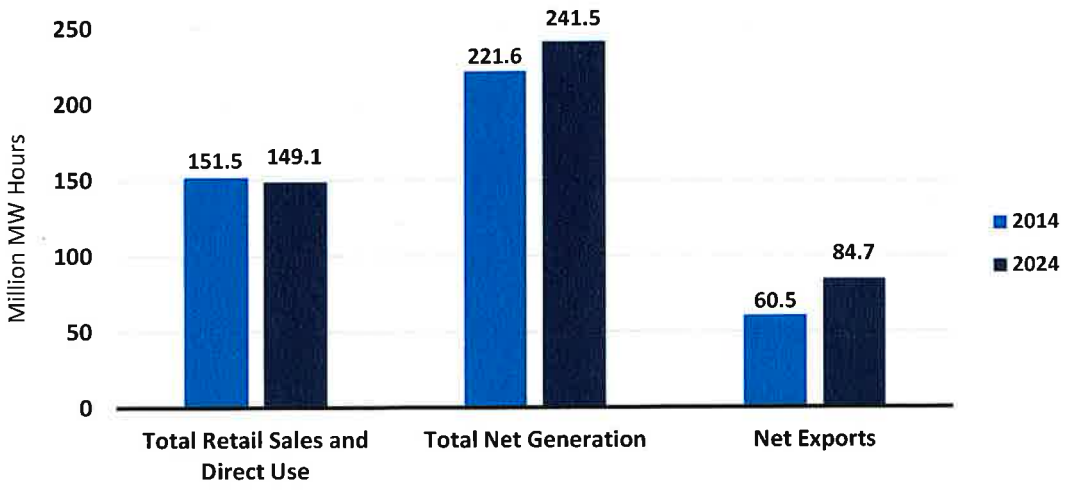
This section provides a backdrop for the proposed Stargazer project by profiling Pennsylvania's electricity production sector and the role that solar energy could play in that sector.

Overall Market

As shown in Figure 1, in 2024, electricity sales and direct use in Pennsylvania totaled 149.1 million megawatt hours. All of that demand was met by in-state utilities, independent producers, and other sources. As a result, Pennsylvania exported the remaining electricity it produced to other states. As with all exports, this means that the jobs, wages, and economic output created by that production occurred in Pennsylvania localities.

Between 2014 and 2024, the total amount of electricity produced in Pennsylvania increased from 221.6 to 241.5 million megawatt hours, while retail and direct consumption of electricity decreased from 151.5 to 149.1 million megawatt hours. Exports of electricity increased by 24.2 million megawatt hours (or 40 percent) during this time.

Figure 1: Demand and Supply of Electricity in Pennsylvania in 2014 and 2024 (in millions of megawatt-hours)[8]



Sources of Production

Figure 2 provides a comparison of the energy sources that were used to produce electricity in Pennsylvania in 2014 and 2024. As these data show, the most significant change between 2014 and 2024 was a decrease in the use of coal and an increase in the use of cleaner-burning natural gas.

While coal was the state's largest source of electricity in 2014, accounting for 79.0 million megawatt hours (or 36 percent) of production, by 2024 production had fallen to 13.0 million megawatt hours (or 5 percent) of production. In contrast, while natural gas accounted for 53.0 million megawatt hours (or 24 percent) of Pennsylvania's electricity production in 2014, that proportion had more than doubled to 143.9 million megawatt hours (or 60 percent) of production by 2024, making natural gas the state's largest source of electricity. In addition, solar, which entered the Pennsylvania electricity production market in 2008, increased its share to 1.1 million megawatt hours in 2024.

[8] Data Source: U.S. Energy Information Administration. In this chart, "Net Exports" also takes into account losses during transmission. As a result, it does not directly equal the residual of "Total Net Generation" minus "Total Retail Sales and Direct Use."

Figure 2: Electricity Generation in Pennsylvania by Energy Source in 2014 and 2024 (in millions of megawatt-hours)[9]

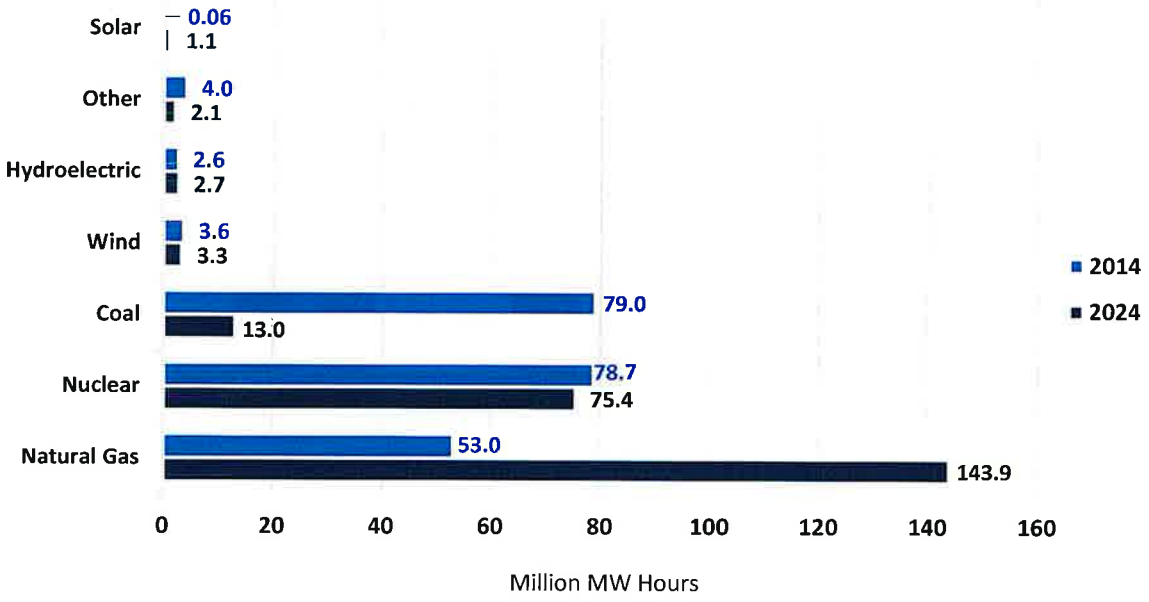
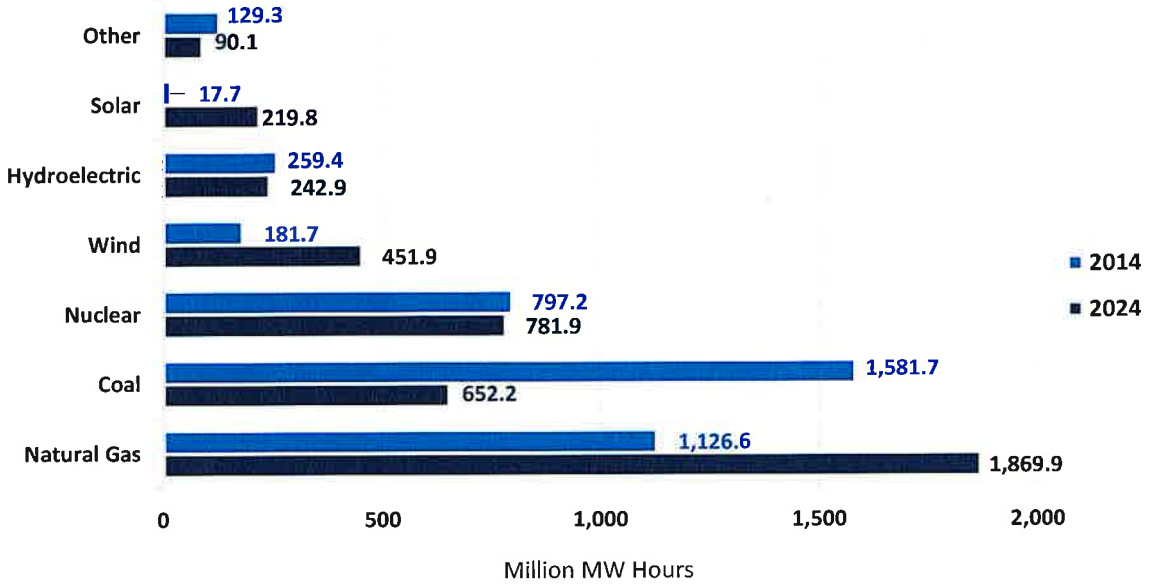


Figure 3 provides similar data for the U.S. as a whole. A quick comparison of Figures 2 and 3 shows that although the degree of reliance on specific energy sources for electricity production is quite different between the U.S. and Pennsylvania, the trend toward lower-emissions energy sources is the same. Nationally, between 2014 and 2024, the amount of electricity produced using coal declined by 929.6 million megawatt hours from 39 to 15 percent of production. In contrast, the amount of electricity produced using natural gas increased by 743.3 million megawatt hours from 28 to 43 percent of production.

Nationwide, as in Pennsylvania, the reliance on renewable energy sources such as solar increased during this time but at a faster pace than in Pennsylvania. Between 2014 and 2024, the amount of electricity produced using solar increased by 202.1 million megawatt hours to 5 percent of total electricity production in the nation as compared to 0.5 percent of total electricity production in Pennsylvania.

[9] Data Source: U.S. Energy Information Administration. The "Other" category includes battery, wood, petroleum, other biomass, "other", other gas, and pumped storage.

Figure 3: Electricity Generation in the United States by Energy Source in 2014 and 2024 (in millions of megawatt-hours)[10]

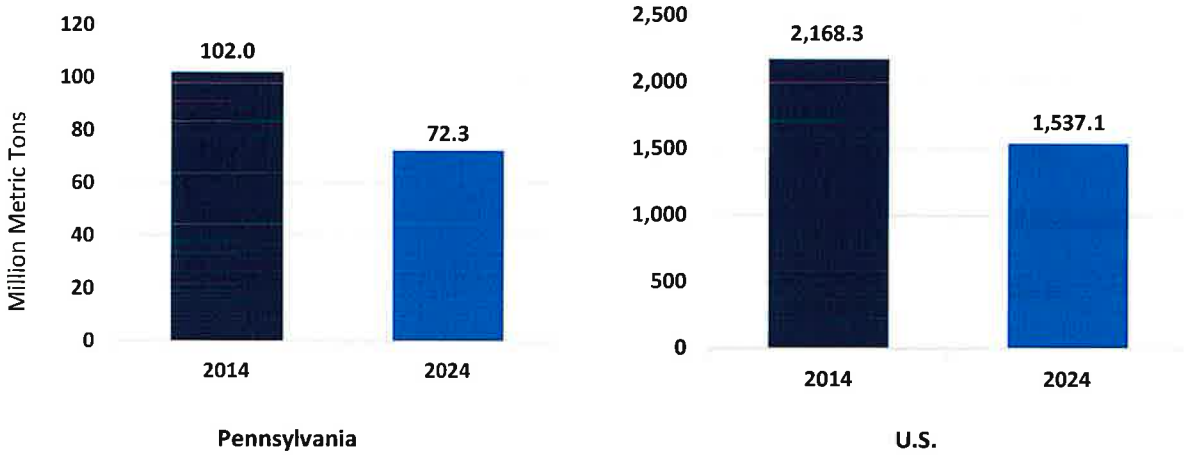


Impact on the Environment

In discussing the impact of these trends on the environment, it is important to realize that electricity production is one of the U.S.'s largest sources of greenhouse gas emissions. Figure 4 depicts carbon dioxide emissions from electricity production in 2014 and 2024 for both Pennsylvania and the U.S. As these data indicate, between 2014 and 2024, as the share of electricity produced in Pennsylvania by coal fell from 36 to 5 percent, carbon dioxide emissions from electricity production fell from 102.0 to 72.3 million metric tons (a 29 percent decrease). Where at the national level, as the share of electricity produced by coal fell from 39 to 15 percent, carbon dioxide emissions from electricity production fell from 2,168.3 to 1,537.1 million metric tons (a 29 percent decrease).

[10] Data Source: U.S. Energy Information Administration. "Other" includes battery, geothermal, other, other biomass, other gas, petroleum, pumped storage, and wood.

Figure 4: Carbon Dioxide Emissions from Electricity Production (millions of metric tons)[11]

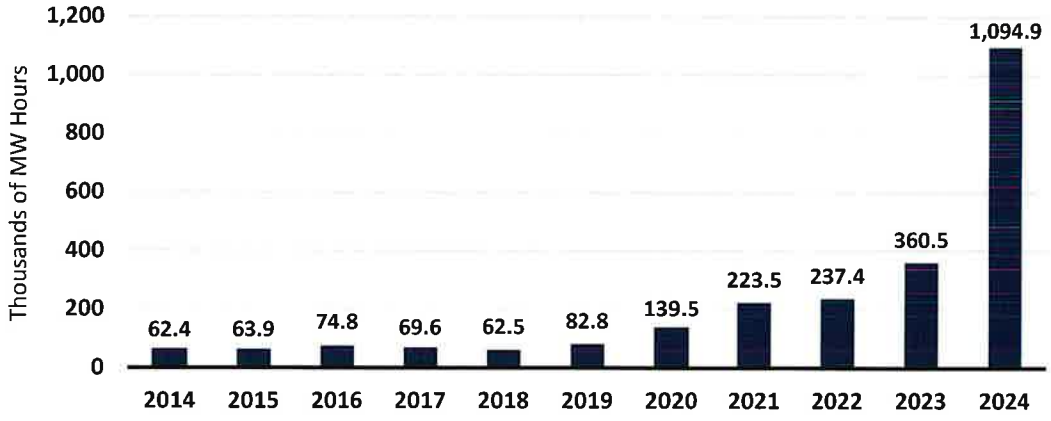


Pennsylvania Solar Industry Trends

Pennsylvania ranks 16th in the nation in terms of proposed solar capacity. With a total of 26 projects in the pipeline totaling a combined 2,447 megawatts of capacity, these proposed projects would add a significant amount of renewable energy to the state's grid.[12] Total investment into the solar industry in Pennsylvania as of the second quarter of 2025 amounts to $6.3 billion.[13]

Figure 5 depicts the progression of solar energy generation in Pennsylvania from 2014 to 2024 expressed in thousands of megawatt-hours. Solar entered the electricity market in Pennsylvania in 2008 with 175 megawatt-hours. Generation has continued to grow throughout the period, reaching its peak, so far, in 2024, with solar generation totaling 1,094.9 thousand megawatt-hours.

Figure 5: Solar Generation in Pennsylvania (in thousands of megawatt-hours) – 2014 to 2024[14]



[11] Data Source: U.S. Energy Information Administration.
[12] Data Source: U.S. Energy Information Administration.
[13] Data Source: Solar Energy Industries Association. Includes residential, community, commercial, and utility solar.
[14] Data Source: U.S. Energy Information Administration.

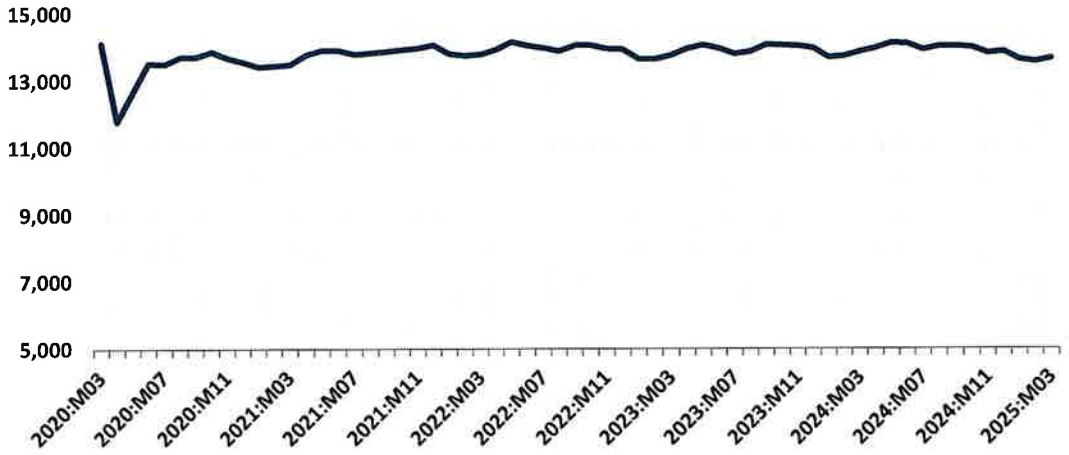
Local Economic Profile

This section provides context for the economic and fiscal impact assessments to follow by profiling the local economy of McKean County.

Total Employment

Figure 6 depicts the trend in total employment in McKean County during the five-year period from March 2020 through March 2025. As these data show, total employment in the county experienced a decline at the beginning of the period due to a decrease in economic activity associated with the COVID-19 pandemic. Total employment has since rebounded and remained generally stable but has not yet recovered from pre-pandemic levels. As of March 2025, total employment in the county stood at 13,655 jobs, which represents an overall decrease in employment of 3.4 percent (or 478 jobs) over the five-year period. To put this number in perspective, over this same period, total statewide employment in Pennsylvania increased by 2.7 percent.[15]

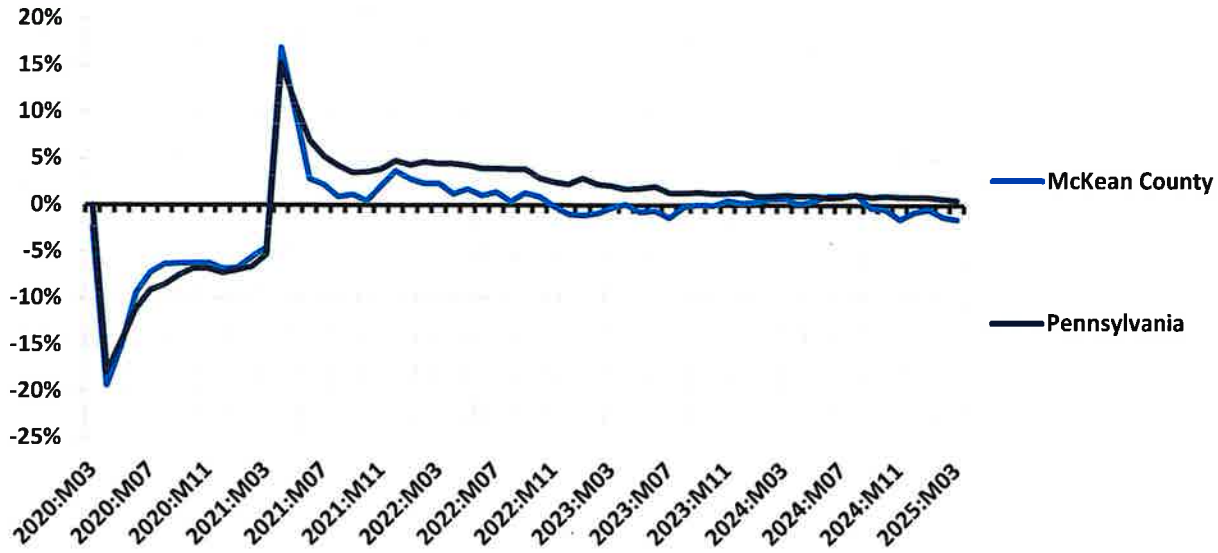
Figure 6: Total Employment in McKean County – March 2020 to March 2025[16]



To control for seasonality and provide a point of reference, Figure 7 compares the year-over-year change in total employment in McKean County to that of the state of Pennsylvania over the same five-year period. Any point above the zero line in this graph indicates an increase in employment, while any point below the zero line indicates a decline in employment. As these data show, McKean County tracked slightly below the statewide average during most of the period. As of March 2025, the year-over-year change in total employment in McKean County was minus 1.5 percent as compared to 0.6 percent statewide in Pennsylvania.

[15] Data Source: U.S. Bureau of Labor Statistics.
[16] Data Source: U.S. Bureau of Labor Statistics.

Figure 7: Year-Over-Year Change in Total Employment – March 2020 to March 2025[17]



Employment and Wages by Industry Supersector

To provide a better understanding of the underlying factors motivating the total employment trends depicted in Figures 6 and 7, Figures 8 through 10 provide data on private employment and wages in McKean County by industry supersector.[18]

Figure 8 provides an indication of the distribution of private sector employment across industry supersectors in McKean County in 2024. As these data indicate, the county's largest industry sectors that year were Manufacturing (2,884 jobs), followed by Education and Health Services (2,533 jobs), and Trade, Transportation and Utilities (2,412 jobs).

Figure 9 provides a similar ranking for average private sector weekly wages by industry supersector in McKean County in 2024. As these data show, the highest paying industry sectors that year were Natural Resources and Mining ($1,578 per week), Manufacturing ($1,275 per week), and Information ($1,196 per week). To provide a point of reference, the average private sector weekly wage across all industry sectors in McKean County that year was $948 per week.

[17] Data Source: U.S. Bureau of Labor Statistics.
[18] A "supersector" is the highest level of aggregation in the coding system that the Bureau of Labor Statistics uses to classify industries.

Figure 8: Private Employment by Industry Supersector in McKean County – 2024[19]

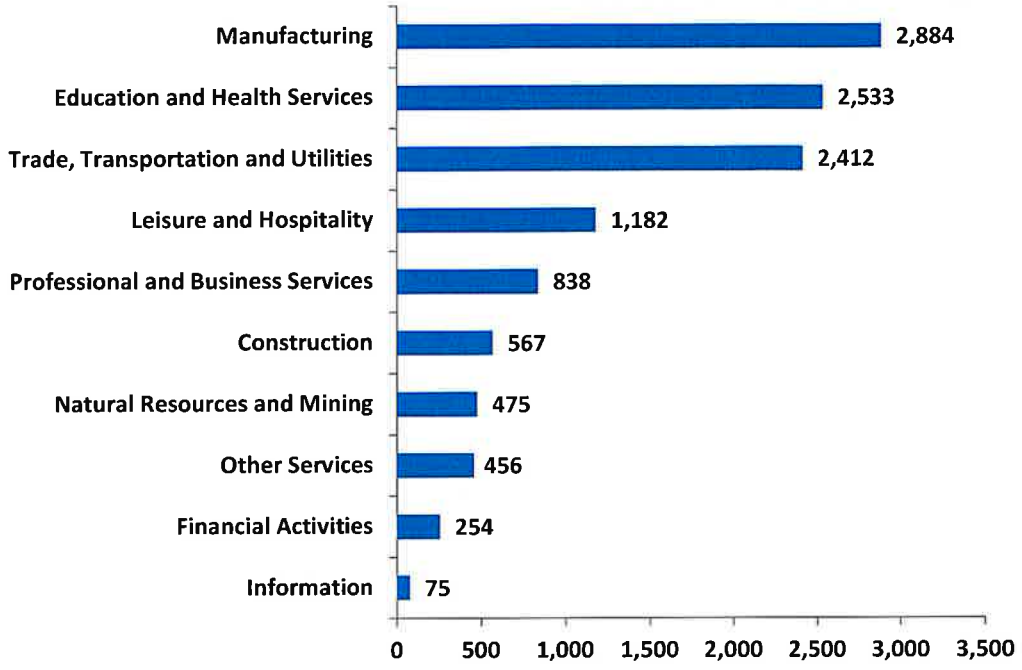
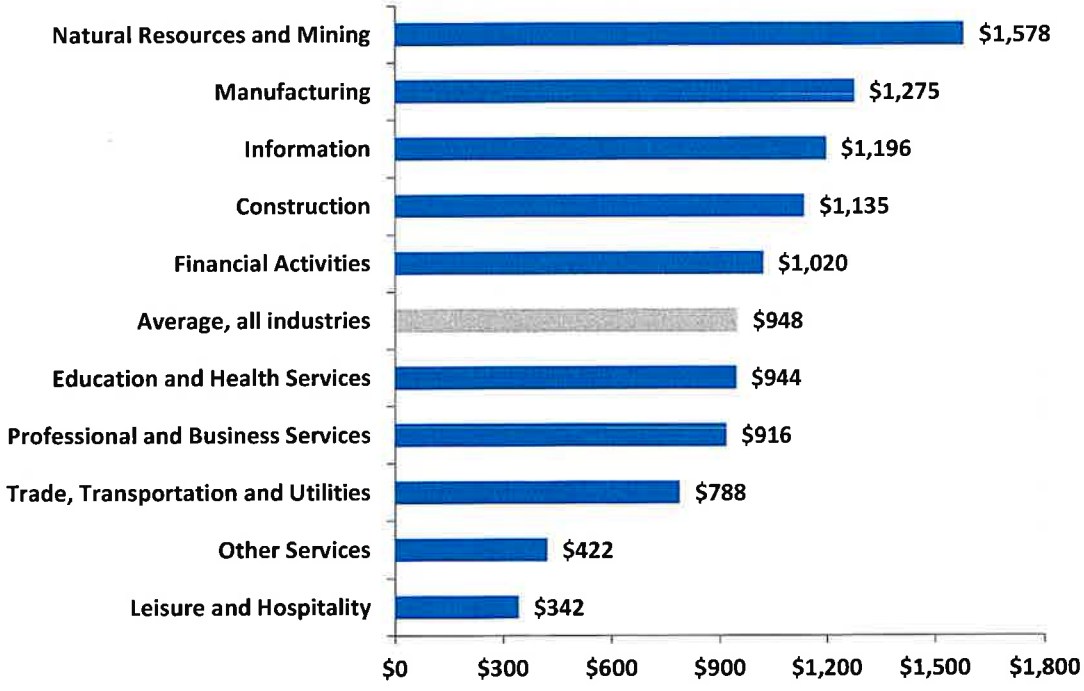


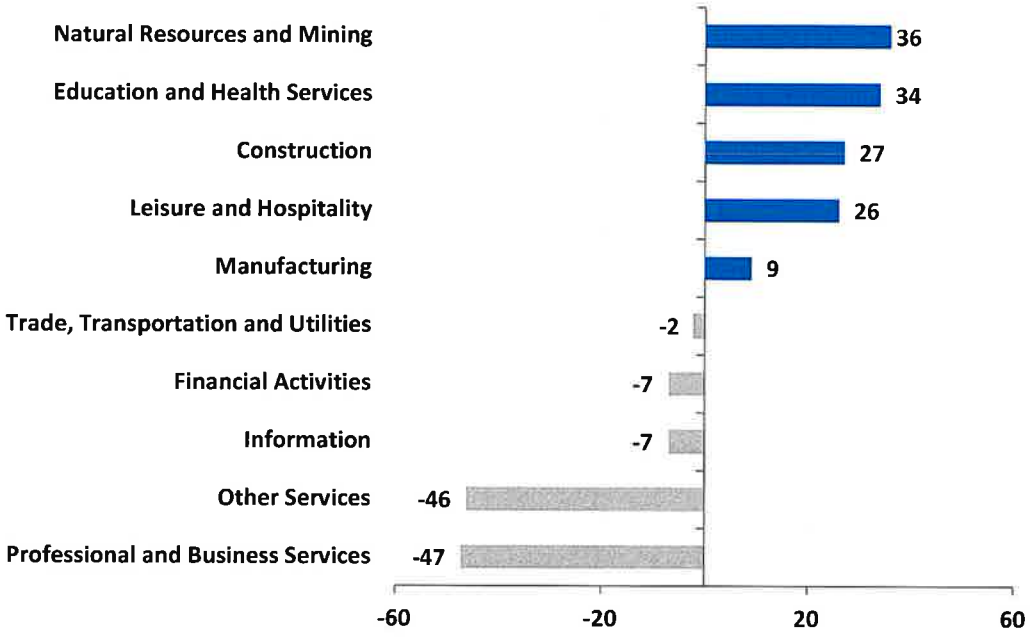
Figure 9: Average Private Weekly Wages by Industry Supersector in McKean County – 2024[20]



[19] Data Source: U.S. Bureau of Labor Statistics.
[20] Data Source: U.S. Bureau of Labor Statistics

Figure 10 details the year-over-year change in private sector employment from 2023 to 2024 in McKean County by industry supersector. Over this period, the largest employment gains occurred in the Natural Resources and Mining (up 36 jobs), Education and Health Services (up 34 jobs), and Construction (up 27 jobs) sectors. The largest employment losses occurred in the Professional and Business Services (down 47 jobs) and Other Services (down 46 jobs) sectors.

Figure 10: Change in Private Employment by Industry Supersector in McKean County from 2023 to 2024[21]

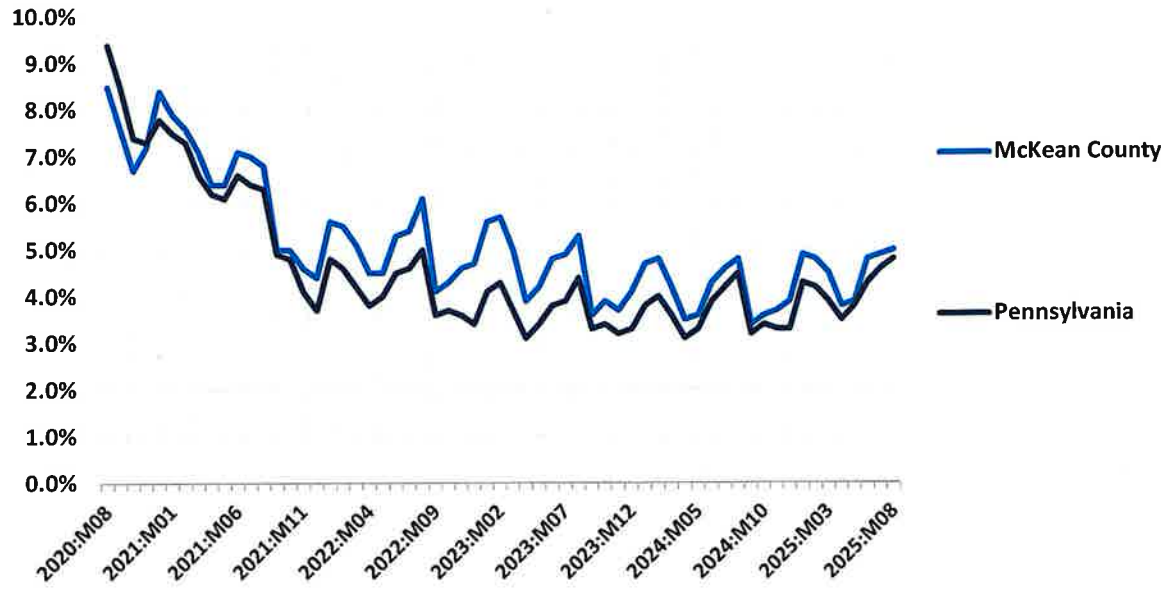


Unemployment

Figure 11 illustrates the trend in McKean County's unemployment rate over the five-year period from August 2020 through August 2025 and benchmarks those data against the statewide trend for Pennsylvania. As these data show, at the beginning of the period, the county and state experienced high unemployment rates as a result of the labor dislocations caused by the COVID-19 pandemic. Throughout the period, unemployment rates in McKean County tracked slightly higher than the statewide trend. As of August 2025, unemployment stood at 5.0 percent in McKean County and at 4.8 percent in Pennsylvania.

[21] Data Source: U.S. Bureau of Labor Statistics.

Figure 11: Unemployment Rate – August 2020 to August 2025[22]



[22] Data Source: U.S. Bureau of Labor Statistics.

Economic Impact

This section quantifies the economic and fiscal contribution that the proposed Stargazer project would make to McKean County and to the state of Pennsylvania. The analysis separately evaluates the pulse of economic activity that would occur during the construction phase of the project, as well as the annual economic activity that the project would generate during its ongoing operational phase.

Method

To empirically evaluate the likely local economic impact attributable to the proposed Stargazer project, the analysis employs a regional economic impact model called IMPLAN.[23] The IMPLAN model is one of the most commonly used economic impact simulation models in the U.S., and is used by universities, state agencies, and research institutes. Like all economic impact models, the IMPLAN model uses economic multipliers to quantify economic impact.

Economic multipliers measure the ripple effects that an expenditure generates as it makes its way through the economy. For example, as when the Stargazer project purchases goods and services – or when contractors hired by the facility use their salaries and wages to make household purchases – thereby generating income for someone else, which is in turn spent, thereby becoming income for yet someone else, and so on, and so on. Through this process, one dollar in expenditures generates multiple dollars of income. The mathematical relationship between the initial expenditure and the total income generated is the economic multiplier.

One of the primary advantages of the IMPLAN model is that it uses regional and national production and trade flow data to construct region-specific and industry-specific economic multipliers, which are then further adjusted to reflect anticipated actual spending patterns within the specific geographic study area that is being evaluated. As a result, the economic impact estimates produced by IMPLAN are not generic. They reflect as precisely as possible the economic realities of the specific industry, and the specific study area, being evaluated.

In the analysis that follows, these impact estimates are divided into three categories. First-round direct impact measures the direct economic contribution of the entity being evaluated (e.g., own employment, wages paid, goods and services purchased by the Stargazer project). Second-round indirect and induced impact measures the economic ripple effects of this direct impact in terms of business to business, and household (employee) to business, transactions. Total impact is simply the sum of the preceding two. These categories of impact are then further defined in terms of employment (the jobs that are created), labor income (the wages and benefits associated with those jobs), and economic output (the total amount of economic activity that is created in the economy).

[23] IMPLAN is produced by IMPLAN Group, LLC.

Construction Phase

This portion of the section assesses the economic and fiscal impact that the pulse of economic activity associated with construction of Stargazer would have on McKean County and the state of Pennsylvania.

Economic Impact Assumptions

The analysis is based on the following assumptions:

- Total capitalized investment associated with Stargazer is estimated to be approximately $936.5 million. Of that total: [24]
  - Engineering, site preparation, and other construction and development costs are estimated to be approximately $598.7 million.
  - Capital equipment costs are estimated to be approximately $337.7 million.
- Stargazer would support approximately 1,500 local and non-local construction jobs during a representative 12-month period.[25]
- For ease of explanation, all construction expenditures are assumed to take place during a representative 12-month period.

Economic Impact on McKean County

As shown in Table 1, based on the analysis, construction of Stargazer would directly provide a pulse of economic activity supporting approximately: 1) 70 jobs, 2) $9.3 million in wages and benefits, and 3) $15.5 million in economic output to McKean County (in 2025 dollars).

Taking into account the economic ripple effects that direct investment and the per diem spending of non-local construction workers would generate, the total estimated impact on McKean County would support approximately: 1) 276 jobs, 2) $16.3 million in wages and benefits, 3) $41.4 million in economic output, and 4) $0.9 million in local tax revenue (in 2025 dollars).

[24] Data Source: RWE. Investment estimate is subject to change based on final design and vendor contracts.
[25] Data Source: Derived from data provided by RWE.

Table 1: Estimated Economic and Fiscal Impact on McKean County from Construction of Stargazer (2025 Dollars)[26,27,28]

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	70	$9,323,700	$15,539,600
2nd Round Indirect and Induced Economic Activity	206	$7,017,800	$25,820,000
Total Economic Activity	**276**	**$16,341,500**	**$41,359,500**
Fiscal Impact[29]			
Total Local Tax Revenue			**$855,500**

**Totals may not sum due to rounding.*

Economic Impact on Pennsylvania

(Includes McKean County impact)

As shown in Table 2, construction of Stargazer would directly provide a pulse of economic activity supporting approximately: 1) 737 jobs, 2) $110.5 million in wages and benefits, and 3) $226.8 million in economic output to the state of Pennsylvania as a whole (in 2025 dollars).

Taking into account the economic ripple effects that direct investment and the per diem spending on non-local construction workers would generate, the total estimated impact on the state of Pennsylvania would support approximately: 1) 1,805 jobs, 2) $183.6 million in wages and benefits, 3) $439.0 million in economic output, and 4) $16.8 million in state and local tax revenue (in 2025 dollars).

[26] Construction sector jobs are not necessarily new jobs, but the investments made can also support a job during the construction of the project. Please note that it is not possible to know with certainty what proportion of these jobs would go to county or state construction contractors or be filled by county or state residents.
[27] One construction job equals one person working full-time for one year. Since construction schedules and daily on-site employment vary, the analysis converts these variations into a consistent, full-time job.
[28] Wages and Benefits are included in the Economic Output associated with the project.
[29] The one-time tax revenue generated from economic activity associated with construction consists of estimates based on the calculations provided in the IMPLAN analysis. Local tax revenue includes collections from all local taxing jurisdictions within the county.

Table 2: Estimated Economic and Fiscal Impact on the State of Pennsylvania from Construction of Stargazer (2025 Dollars)

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	737	$110,495,500	$226,764,900
2nd Round Indirect and Induced Economic Activity	1,068	$73,146,500	$212,214,000
Total Economic Activity	**1,805**	**$183,642,000**	**$438,978,900**
Fiscal Impact[30]			
Local Tax Revenue			**$6,792,800**
State Tax Revenue			**$9,996,000**
Total State and Local Tax Revenue			**$16,788,800**

**Totals may not sum due to rounding.*

Ongoing Operations Phase

This portion of the section assesses the annual economic impact that Stargazer would provide to McKean County and the state of Pennsylvania during its anticipated 40-year operational phase.

Economic Impact Assumptions

The analysis is based on the following assumptions:

- Stargazer would employ approximately 10 full-time employees and would source locally and statewide available services and materials for maintenance of the facility.[31]

Economic Impact on McKean County

Applying these assumptions in the IMPLAN model results in the following estimates of annual economic impact on McKean County. As shown in Table 3, annual operation of Stargazer would on average directly support approximately: 1) 10 jobs, 2) $1.2 million in wages and benefits, and 3) $3.8 million in economic output to McKean County (in 2025 dollars).

Taking into account the economic ripple effects that direct impact would generate, the total estimated annually supported impact on McKean County would be approximately: 1) 19 jobs, 2) $1.6 million in wages and benefits, and 3) $5.2 million in economic output (in 2025 dollars).

[30] The one-time tax revenue generated from economic activity associated with construction consists of estimates based on the calculations provided in the IMPLAN analysis. Local tax revenue includes collections from all local taxing jurisdictions within the state benefiting from the project.
[31] Data Source: RWE. Subject to change based on vendor contracts.

Table 3: Estimated Annual Economic Impact on McKean County from the Ongoing Operation of Stargazer (2025 Dollars)

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	10	$1,242,000	$3,813,100
2nd Round Indirect and Induced Economic Activity	9	$396,800	$1,397,600
Total Economic Activity	**19**	**$1,638,800**	**$5,210,700**

**Totals may not sum due to rounding.*

Economic Impact on Pennsylvania

(Includes McKean County impact)

Applying these assumptions in the IMPLAN model results in the following estimates of annual economic impact on the state of Pennsylvania. As shown in Table 4, annual operation of Stargazer would directly support approximately: 1) 10 jobs, 2) $1.2 million in wages and benefits, and 3) $3.9 million in economic output to the state of Pennsylvania (in 2025 dollars).

Taking into account the economic ripple effects that direct impact would generate, the total estimated annually supported impact on the state of Pennsylvania would be approximately: 1) 27 jobs, 2) $2.3 million in wages and benefits, and 3) $6.9 million in economic output (in 2025 dollars).

Table 4: Estimated Annual Economic Impact on the State of Pennsylvania from the Ongoing Operation of Stargazer (2025 Dollars)

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	10	$1,242,000	$3,910,100
2nd Round Indirect and Induced Economic Activity	17	$1,037,800	$3,011,600
Total Economic Activity	**27**	**$2,279,800**	**$6,921,700**

**Totals may not sum due to rounding.*

Fiscal Impact

This section quantifies the direct fiscal contribution that the proposed Stargazer project would make to McKean County and its local taxing jurisdictions. It should be noted at the outset, however, that the analysis that follows likely understates the actual fiscal impact that Stargazer would have on the county as it only accounts for the direct fiscal impact that the project would generate. It does not take into account any additional tax revenue that would be generated as a result of the indirect economic activity attributable to the ongoing operation of Stargazer.

Fiscal Impact Assumptions

The analysis is based on the following assumptions:

- Stargazer would be situated on approximately 3,225 actively used, fenced-in acres.[32]
- The fenced-in acreage would be removed from the Clean and Green (C&G) Program and reassessed at an estimated solar use market value of $10,000 per acre.[33]
- The fenced-in acreage would be located in Smethport Area School District and distributed across the three townships as follows: 4 percent in Hamlin Township, 13 percent in Norwich Township, and 84 percent in Sergeant Township.[34]
- Stargazer would have an operational life of approximately 40 years.[35]
- The solar panels, equipment, and foundations are not considered real property and would not be taxed.[36]
- Millage rates and assessment values remain constant throughout the analysis.

Taxation of Real Estate

Table 5 details the increased tax revenue associated with removing the affected acreage from the Clean and Green Program and reassessing the land as solar use property. The local real estate tax revenue from the project after reassessment is estimated to be approximately $44.7 million over the project's anticipated 40-year operational life, including the one-time rollback taxes of approximately $1.0 million (in 2025 dollars).

This cumulative total consists of approximately $17.8 million in McKean County revenue, approximately $0.2 million in Hamlin Township revenue, approximately $0.3 million in Norwich Township revenue,

[32] Data Source: RWE.
[33] Data Source: Estimated market value provided by RWE. Future assessment values for Stargazer are currently unknown. Actual assessment value may vary.
[34] Data Source: RWE. Estimated distribution based on preliminary layout. Subject to change based on final design.
[35] Data Source: RWE.
[36] Pursuant to Pennsylvania Statutes Title 53 Pa C.S.A. §8811 and Title 72 P.S. §5020-201. Assumes equipment is considered industrial machinery and equipment.

approximately $0.4 million in Sergeant Township revenue, and approximately $26.0 million in Smethport Area School District (SD) revenue (in 2025 dollars).

Table 5: Estimated Local Revenue Generated by Stargazer from Taxation of Real Estate Over 40 Years (2025 Dollars)

	McKean County	Hamlin Township	Norwich Township	Sergeant Township	Smethport Area SD	Total
Estimated Assessed Value – Solar Use[37,38]						$32,254,200
Millage Rate (per $1,000)[39]	13.50	4.80	2.00	0.375	19.69	-
Annual Real Estate Tax – Solar Use	$435,400	$5,500	$8,100	$10,100	$635,100	$1,094,300
Cumulative Revenue	**$17,417,300**	**$219,300**	**$324,300**	**$405,900**	**$25,403,400**	**$43,770,200**
One-time Rollback Taxes[40]	$368,400	$5,000	$7,500	$9,300	$584,900	$975,100
Total Cumulative Revenue	**$17,785,600**	**$224,400**	**$331,800**	**$415,200**	**$25,988,300**	**$44,745,300**

**Totals may not sum due to rounding.*

Community Benefit Agreement

Community benefit agreements can add significant value to the overall fiscal impact of solar projects to their host localities. RWE intends to pursue community benefit agreements with the associated townships, providing a combined annual contribution of approximately $750 per megawatt (MW) alternating current (AC) of project capacity located in each township. The estimated combined township contribution would be approximately $360,000 per year, resulting in a cumulative total of approximately $14.4 million over the project's anticipated 40-year operational life.[41]

This additional local revenue is excluded from the analysis as the final contribution is subject to negotiation between Stargazer and its host localities.

[37] Data Source: RWE and McKean County's GIS property record database.
[38] McKean County Assessor's office. Property is assessed at 100 percent of fair market value.
[39] Data Source: McKean County Assessor's office. 2025 Property Millage Rates.
[40] Rollback taxes are estimated based on the difference between the current C&G value assessment tax and the tax on the fair market value for six complete tax years plus the current year, plus simple interest.
[41] Data Source: RWE.

Relative Comparisons

Table 6 compares the total annual McKean County real estate tax revenue generated by Stargazer to McKean County's current highest property taxpayers. As indicated in Table 6, Stargazer's estimated annual McKean County tax revenue of approximately $0.4 million would make it the highest contributing "taxpayer" in McKean County based on 2025 assessments. Stargazer would provide more than twice as much revenue as the county currently collects annually from its highest taxpayer, Zippo Manufacturing Company, and more than three times as much revenue as each of the county's remaining taxpayers.

Table 6: Highest Property Taxpayers in McKean County (2025) and Stargazer's Estimated Annual McKean County Tax Revenue[42,43]

Rank	Taxpayer	Annual Tax Amount
	Stargazer's Estimated Annual Contribution	**$435,400**
1	Zippo Manufacturing Company	$161,055
2	The Lyme Timber Company	$137,342
3	Bradford Hospital	$121,452
4	Bradford Ecumenical Home	$70,403
5	American Refining Group	$65,629
6	Georgia-Pacific Panel Products LLC	$58,769
7	The Rossi Group LLC	$55,203
8	Casella Waste Management LLC	$54,112
9	Wal-Mart Associates Inc	$54,036
10	Ardagh Group	$49,220

[42] Data Source: RWE and McKean County Assessor's office.
[43] Derived from data provided by McKean County's GIS property record database. Current estimated tax revenues account for all parcels owned by the associated businesses. Totals may vary if parcel ownership is recorded under other entity names.

Current Use

This section provides a benchmark for the previous estimates of the economic and fiscal impact that the proposed Stargazer project would have on McKean County by estimating the economic and fiscal impact that the site has on the county in its current use.

Economic Impact Assumptions

The analysis is based on the following assumptions:

- Stargazer would be situated on an approximate 3,225-acre tract of timberland.[44]

Economic Impact

Applying these assumptions in the IMPLAN model results in the following estimates of annual economic impact. As shown in Table 7, in its current use, the project site on average directly supports approximately: 1) 2 jobs, 2) $0.2 million in wages and benefits, and 3) $0.2 million in economic output to McKean County (in 2025 dollars).

Taking into account the economic ripple effects that direct impact generates, on average, the total annually supported impact on McKean County is approximately: 1) 3 jobs, 2) $0.2 million in wages and benefits, and 3) $0.3 million in economic output (in 2025 dollars).

Table 7: Estimated Annual Economic Impact of the Project Site on McKean County – Current Use (2025 Dollars)[45]

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	2	$174,400	$197,200
2nd Round Indirect and Induced Economic Activity	1	$34,100	$96,000
Total Economic Activity	**3**	**$208,500**	**$293,300**

**Totals may not sum due to rounding.*

[44] Data Source: RWE.
[45] Calculations based data from the U.S. Department of Agriculture and IMPLAN Group, LLC for Pennsylvania and McKean County.

Fiscal Impact Assumptions

The analysis is based on the following assumptions:

- The current assessment value of the affected acreage is approximately $0.6 million.[46]

Fiscal Impact

Table 8 details the estimated local real estate tax revenue that the project site generates in its current use. As the data in Table 8 indicate, the current local real estate tax revenue from the project site is estimated to be approximately $20,500 per year, for a cumulative total of approximately $0.8 million over 40 years. This cumulative total consists of approximately $0.3 million in McKean County revenue, approximately $4,100 in Hamlin Township revenue, approximately $6,100 in Norwich Township revenue, approximately $7,600 in Sergeant Township revenue, and approximately $0.5 million in Smethport Area School District (SD) revenue (in 2025 dollars).

Table 8: Estimated Local Revenue Generated by the Project Site from Taxation of Real Estate Over 40 Years – Current Use (2025 Dollars)

	McKean County	Hamlin Township	Norwich Township	Sergeant Township	Smethport Area SD	Total
Estimated Assessed Value – Current Use						$604,300
Millage Rate (per $1,000)	13.50	4.80	2.00	0.375	19.69	-
Annual Real Estate Tax – Current Use	$8,200	$100	$150	$190	$11,900	$20,500
Cumulative Revenue	**$326,300**	**$4,100**	**$6,100**	**$7,600**	**$475,900**	**$820,000**

**Totals may not sum due to rounding.*

The estimates provided in this report are based on the best information available and all reasonable care has been taken in assessing the quality of that information. However, because these estimates attempt to foresee the consequences of circumstances that have not yet occurred, it is not possible to be certain that they will be representative of actual events. These estimates are intended to provide a good indication of likely future outcomes and should not be construed to represent a precise measure of those outcomes.

[46] Data Source: McKean County's GIS property record database.

STARGAZER

ECONOMIC AND FISCAL CONTRIBUTION TO MCKEAN COUNTY AND THE STATE OF PENNSYLVANIA

Prepared for

RWE

MANGUM economics®

804-322-7777
MANGUMECONOMICS.COM

SEPTEMBER 2025
REVISED DECEMBER 2025

About Mangum Economics, LLC

Mangum Economics was founded in 2003 and since then, we have become known as a leader in industry analysis, economic impact assessment, policy and program evaluation, and economic and workforce strategy development. The Mangum Team specializes in producing objective and actionable quantitative economic research that our clients use for strategic decision making in a variety of industries and environments. We know that our clients are unique, and that one size does not fit all. As a result, we have a well-earned reputation for tailoring our analyses to meet the specific needs of specific clients, with a specific audience.

Most of our research falls into four general categories:

- **Energy:** The Mangum Team has produced analyses of the economic and fiscal impact of over 50 GW of proposed solar, wind, battery energy storage, and hydro projects spanning more than thirty states ranging from 1 MW to over 800 MW in capacity, including small-scale distributed facilities. Among those projects was Dominion's 2.6 GW Coastal Virginia Offshore Wind project off of Virginia Beach. In addition, the Mangum Team has also performed economic and fiscal impact analyses for the natural gas, nuclear, oil, and pipeline industries.
- **Economic Development and Special Projects:** The Mangum Team has performed hundreds of analyses of proposed economic development projects and existing entities including museums and tourist attractions, hospital systems, industrial development and mixed-use projects, and economic development regions. The Mangum Team has also authored multiple economic development plans and assessed the impacts of international trade and an overseas trade office.
- **Advanced Applied Technology:** The Mangum Team specializes in analyzing how advanced technology developments (like data centers, fiber networks, and advanced manufacturing plants) contribute to the state and local economies. We have worked with local governments, trade associations, developers, and operating firms across the country to show how investments in advanced critical infrastructure transform local economies across the country.
- **Policy Analysis:** The Mangum Team also has extensive experience in identifying and quantifying the intended and unintended economic consequences of proposed legislative and regulatory initiatives.

The Project Team

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Director – Economic Development & Energy Research

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Research Analyst

A. Fletcher Mangum, Ph.D.
Founder and CEO

Table of Contents

Executive Summary

This report assesses the economic and fiscal contribution that the proposed Stargazer project would make to McKean County and to the state of Pennsylvania.

Stargazer is a proposed 480-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The project would be located east of US-6 and west of US-46 in McKean County, Pennsylvania. The actively used, fenced-in site would be approximately 3,225 acres.

The primary findings from the assessment are as follows:

Economic Contribution – Construction[1,2]

- Stargazer would support approximately 1,500 local and non-local construction jobs during a representative 12-month period.
- Stargazer would provide an estimated pulse of economic activity to McKean County during its construction phase supporting approximately:
  - 70 direct and 206 indirect and induced local jobs,
  - $16.3 million in associated local wages and benefits,
  - $41.4 million in local economic output, and
  - $0.9 million in local tax revenue (in 2025 dollars).
- Stargazer would provide an estimated pulse of economic activity to the state of Pennsylvania (including McKean County) during its construction phase supporting approximately:
  - 737 direct and 1,068 indirect and induced jobs,
  - $183.6 million in associated wages and benefits,
  - $439.0 million in economic output,
  - $6.8 million in local tax revenue[3], and
  - $10.0 million in state tax revenue (in 2025 dollars).

Economic Contribution – Ongoing Operations

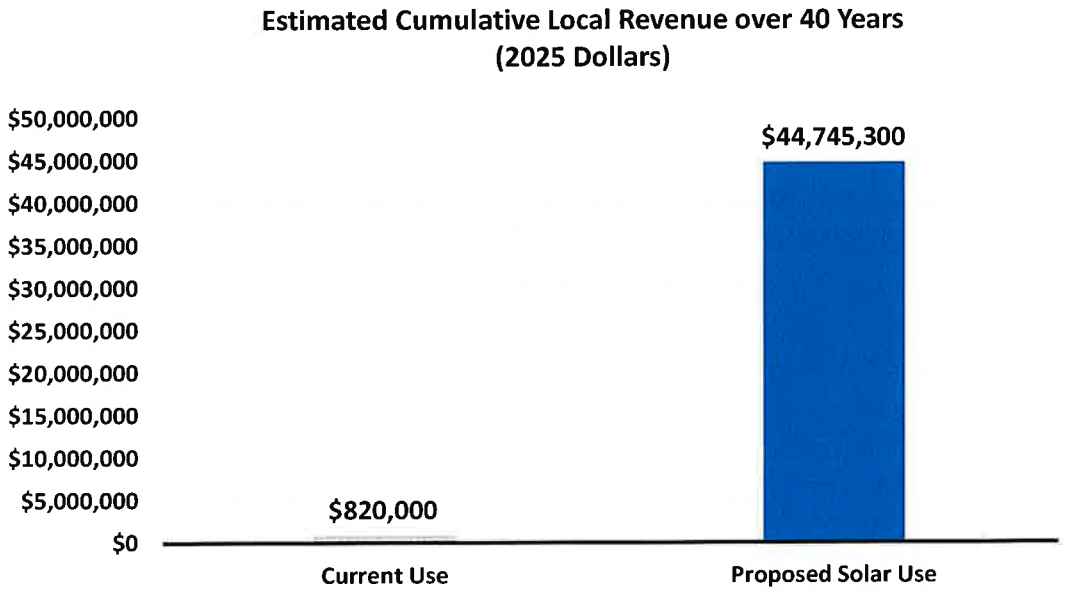
- Stargazer would provide an estimated annual economic impact to McKean County during its ongoing operational phase supporting approximately:
  - 10 direct and 9 indirect and induced local jobs,
  - $1.6 million in associated local wages and benefits, and
  - $5.2 million in local economic output (in 2025 dollars).

[1] Construction sector jobs are not necessarily new jobs, but the investments made can also support a job during the construction of the project. Please note it is not possible to know with certainty what proportion of jobs would go to county or state construction contractors or be filled by county or state residents.
[2] One construction job equals one person working full-time for one year. Since construction schedules and daily on-site employment vary, the analysis converts these variations into a consistent, full-time job.
[3] Local tax revenue includes collections from all local taxing jurisdictions within the state benefiting from the project.

- Stargazer would provide an estimated annual economic impact to the state of Pennsylvania (including McKean County) during its ongoing operational phase supporting approximately:
  - 10 direct and 17 indirect and induced jobs,
  - $2.3 million in associated wages and benefits, and
  - $6.9 million in economic output (in 2025 dollars).

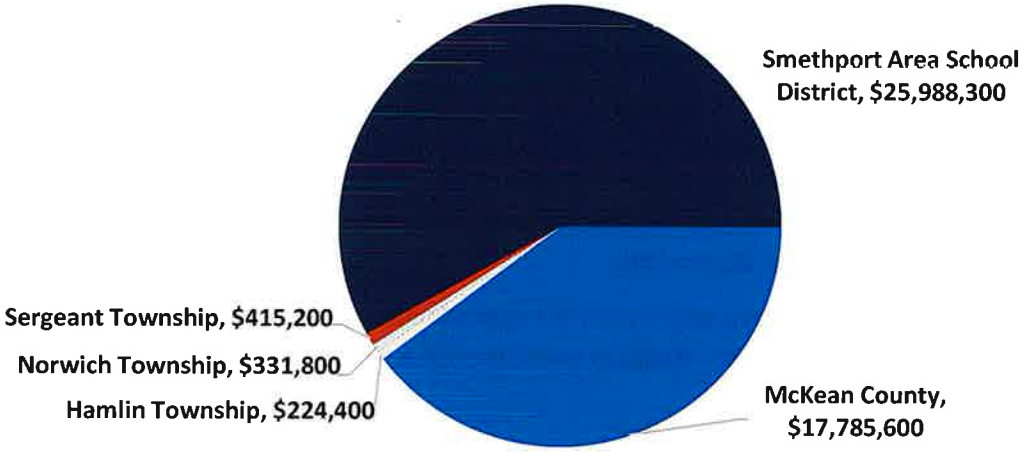
Fiscal Contribution

- Assuming revenues are generated from real estate taxes including rollback taxes, Stargazer would generate approximately $44.7 million in cumulative local revenue over the facility's anticipated 40-year operational life (in 2025 dollars).
- In its current use, the property would generate approximately $0.8 million in cumulative local revenue over a 40-year period – Stargazer would provide a 55-fold increase over current revenues respectively (in 2025 dollars).



- The estimated $44.7 million in cumulative local revenue consists of approximately:
  - $17.8 million in McKean County tax revenue,
  - $0.2 million in Hamlin Township tax revenue,
  - $0.3 million in Norwich Township tax revenue,
  - $0.4 million in Sergeant Township tax revenue, and
  - $26.0 million in Smethport Area School District (SD) tax revenue (in 2025 dollars).

Estimated Cumulative Local Revenue over 40 Years from Stargazer by Source (2025 Dollars)



Total: $44,745,300

Relative Comparisons

- The estimated annual McKean County tax revenue of approximately $435,400 would make Stargazer the highest property taxpayer in McKean County (in 2025 dollars).[4]
- Stargazer would provide more than twice as much revenue as the county currently collects annually from its highest taxpayer, Zippo Manufacturing Company, and more than three times as much revenue as the county's remaining taxpayers.[5]

Stargazer would provide a boost to McKean County's construction sector:

- At 567 jobs, construction is McKean County's sixth largest major industry sector.[6]
- Additionally, the construction sector experienced a gain of approximately 27 jobs between 2023 and 2024.[7]
- Stargazer would directly support approximately 70 jobs and $9.3 million in wages and benefits in McKean County's construction sector (in 2025 dollars).

[4] Please note the comparison is based on the estimated tax revenue collected by the McKean County taxing jurisdiction only. It excludes revenue generated by the other taxing jurisdictions.
[5] Derived from data provided by McKean County's GIS property record database. Current estimated tax revenues account for all parcels owned by the associated businesses. Totals may vary if parcel ownership is recorded under other entity names.
[6] Data Source: U.S. Bureau of Labor Statistics.
[7] Data Source: U.S. Bureau of Labor Statistics.

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The estimates provided in this report are based on the best information available and all reasonable care has been taken in assessing the quality of that information. However, because these estimates attempt to foresee the consequences of circumstances that have not yet occurred, it is not possible to be certain that they will be representative of actual events. These estimates are intended to provide a good indication of likely future outcomes and should not be construed to represent a precise measure of those outcomes.

Introduction

This report assesses the economic and fiscal contribution that the proposed Stargazer project would make to McKean County and to the state of Pennsylvania. This report was commissioned by RWE Clean Energy (RWE) and produced by Mangum Economics.

The Project

Stargazer is a proposed 480-megawatt (MW) alternating current (AC) solar photovoltaic power generating facility. The project would be located east of US-6 and west of US-46 in McKean County, Pennsylvania. The actively used, fenced-in site would be approximately 3,225 acres.

Electricity Production in Pennsylvania

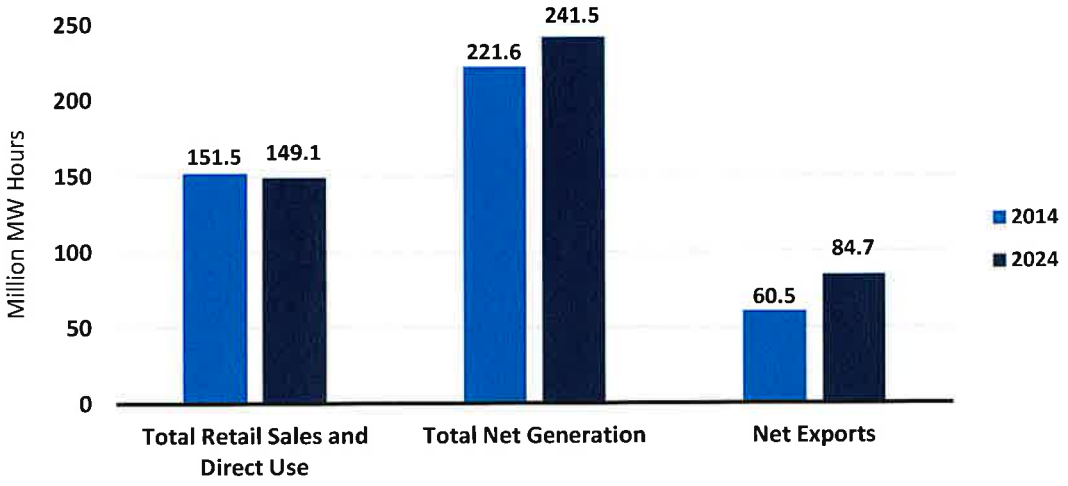
This section provides a backdrop for the proposed Stargazer project by profiling Pennsylvania's electricity production sector and the role that solar energy could play in that sector.

Overall Market

As shown in Figure 1, in 2024, electricity sales and direct use in Pennsylvania totaled 149.1 million megawatt hours. All of that demand was met by in-state utilities, independent producers, and other sources. As a result, Pennsylvania exported the remaining electricity it produced to other states. As with all exports, this means that the jobs, wages, and economic output created by that production occurred in Pennsylvania localities.

Between 2014 and 2024, the total amount of electricity produced in Pennsylvania increased from 221.6 to 241.5 million megawatt hours, while retail and direct consumption of electricity decreased from 151.5 to 149.1 million megawatt hours. Exports of electricity increased by 24.2 million megawatt hours (or 40 percent) during this time.

Figure 1: Demand and Supply of Electricity in Pennsylvania in 2014 and 2024 (in millions of megawatt-hours)[8]



Sources of Production

Figure 2 provides a comparison of the energy sources that were used to produce electricity in Pennsylvania in 2014 and 2024. As these data show, the most significant change between 2014 and 2024 was a decrease in the use of coal and an increase in the use of cleaner-burning natural gas.

While coal was the state's largest source of electricity in 2014, accounting for 79.0 million megawatt hours (or 36 percent) of production, by 2024 production had fallen to 13.0 million megawatt hours (or 5 percent) of production. In contrast, while natural gas accounted for 53.0 million megawatt hours (or 24 percent) of Pennsylvania's electricity production in 2014, that proportion had more than doubled to 143.9 million megawatt hours (or 60 percent) of production by 2024, making natural gas the state's largest source of electricity. In addition, solar, which entered the Pennsylvania electricity production market in 2008, increased its share to 1.1 million megawatt hours in 2024.

[8] Data Source: U.S. Energy Information Administration. In this chart, "Net Exports" also takes into account losses during transmission. As a result, it does not directly equal the residual of "Total Net Generation" minus "Total Retail Sales and Direct Use."

Figure 2: Electricity Generation in Pennsylvania by Energy Source in 2014 and 2024 (in millions of megawatt-hours)[9]

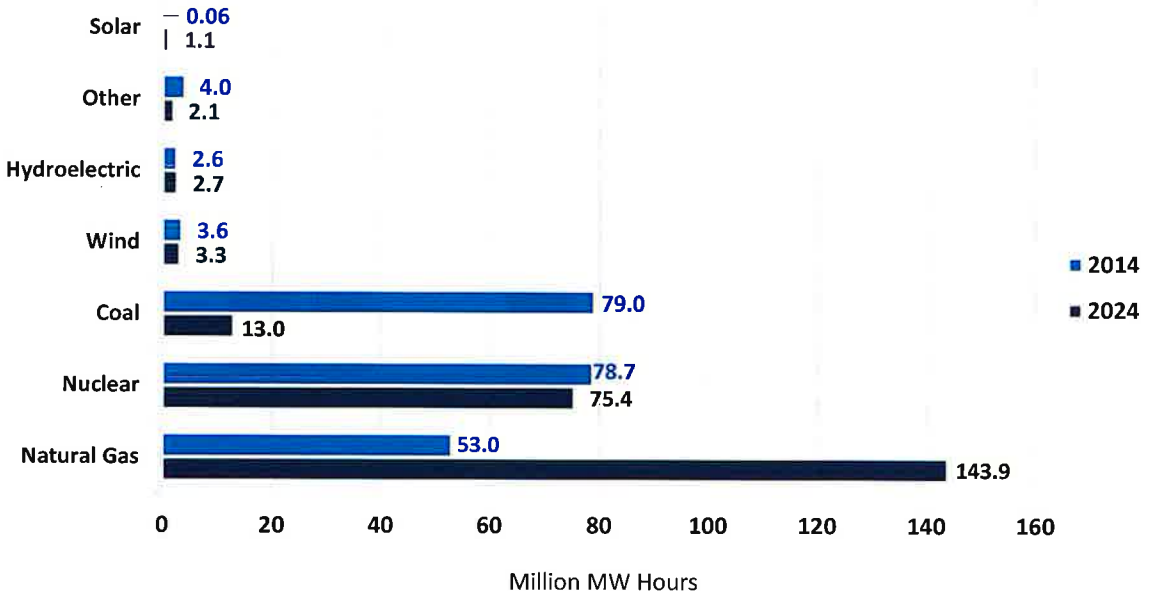
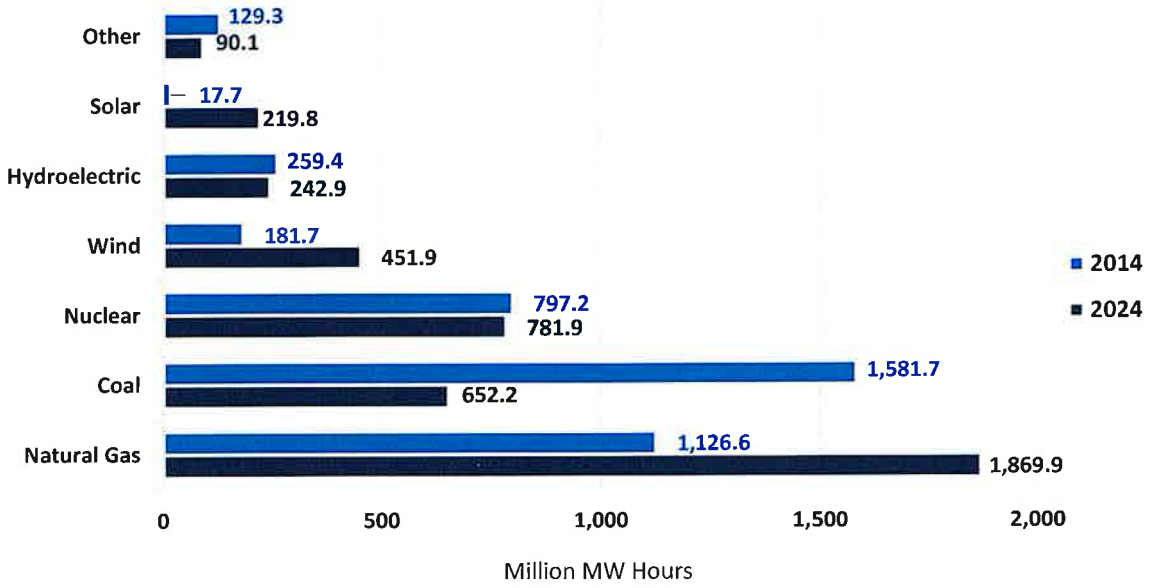


Figure 3 provides similar data for the U.S. as a whole. A quick comparison of Figures 2 and 3 shows that although the degree of reliance on specific energy sources for electricity production is quite different between the U.S. and Pennsylvania, the trend toward lower-emissions energy sources is the same. Nationally, between 2014 and 2024, the amount of electricity produced using coal declined by 929.6 million megawatt hours from 39 to 15 percent of production. In contrast, the amount of electricity produced using natural gas increased by 743.3 million megawatt hours from 28 to 43 percent of production.

Nationwide, as in Pennsylvania, the reliance on renewable energy sources such as solar increased during this time but at a faster pace than in Pennsylvania. Between 2014 and 2024, the amount of electricity produced using solar increased by 202.1 million megawatt hours to 5 percent of total electricity production in the nation as compared to 0.5 percent of total electricity production in Pennsylvania.

[9] Data Source: U.S. Energy Information Administration. The "Other" category includes battery, wood, petroleum, other biomass, "other", other gas, and pumped storage.

Figure 3: Electricity Generation in the United States by Energy Source in 2014 and 2024 (in millions of megawatt-hours)[10]

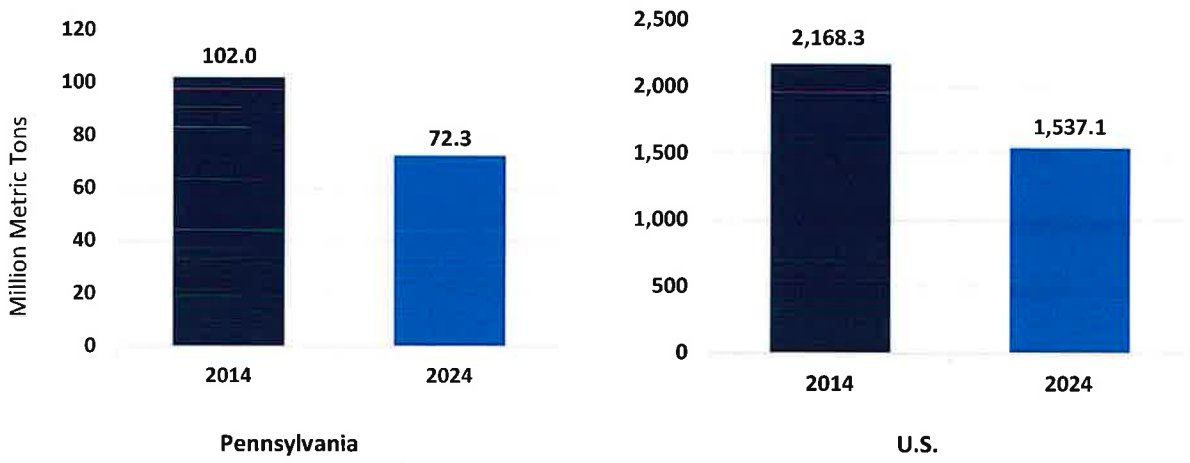


Impact on the Environment

In discussing the impact of these trends on the environment, it is important to realize that electricity production is one of the U.S.'s largest sources of greenhouse gas emissions. Figure 4 depicts carbon dioxide emissions from electricity production in 2014 and 2024 for both Pennsylvania and the U.S. As these data indicate, between 2014 and 2024, as the share of electricity produced in Pennsylvania by coal fell from 36 to 5 percent, carbon dioxide emissions from electricity production fell from 102.0 to 72.3 million metric tons (a 29 percent decrease). Where at the national level, as the share of electricity produced by coal fell from 39 to 15 percent, carbon dioxide emissions from electricity production fell from 2,168.3 to 1,537.1 million metric tons (a 29 percent decrease).

[10] Data Source: U.S. Energy Information Administration. "Other" includes battery, geothermal, other, other biomass, other gas, petroleum, pumped storage, and wood.

Figure 4: Carbon Dioxide Emissions from Electricity Production (millions of metric tons)[11]

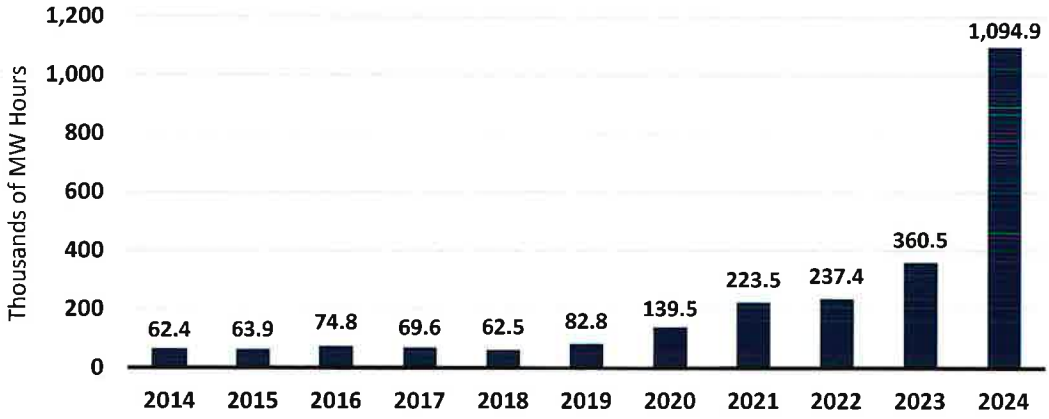


Pennsylvania Solar Industry Trends

Pennsylvania ranks 16th in the nation in terms of proposed solar capacity. With a total of 26 projects in the pipeline totaling a combined 2,447 megawatts of capacity, these proposed projects would add a significant amount of renewable energy to the state's grid.[12] Total investment into the solar industry in Pennsylvania as of the second quarter of 2025 amounts to $6.3 billion.[13]

Figure 5 depicts the progression of solar energy generation in Pennsylvania from 2014 to 2024 expressed in thousands of megawatt-hours. Solar entered the electricity market in Pennsylvania in 2008 with 175 megawatt-hours. Generation has continued to grow throughout the period, reaching its peak, so far, in 2024, with solar generation totaling 1,094.9 thousand megawatt-hours.

Figure 5: Solar Generation in Pennsylvania (in thousands of megawatt-hours) – 2014 to 2024[14]



[11] Data Source: U.S. Energy Information Administration.
[12] Data Source: U.S. Energy Information Administration.
[13] Data Source: Solar Energy Industries Association. Includes residential, community, commercial, and utility solar.
[14] Data Source: U.S. Energy Information Administration.

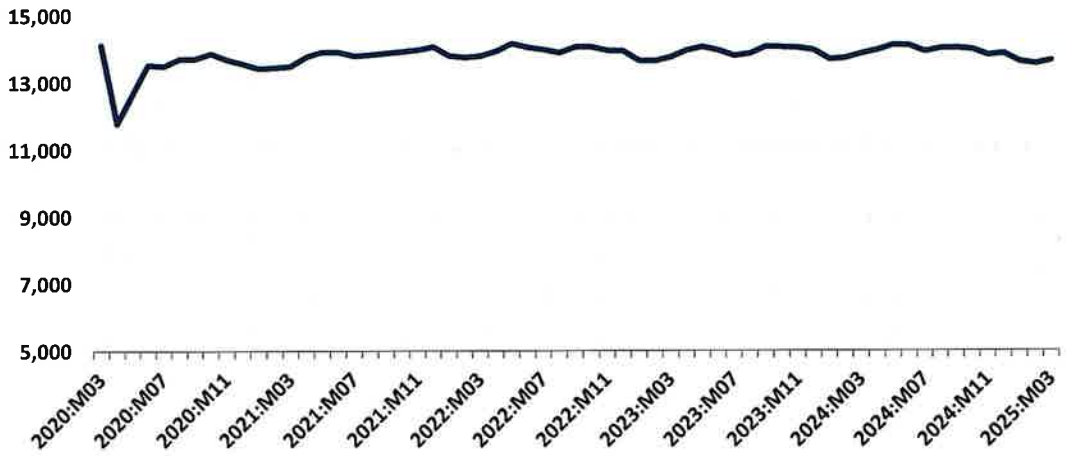
Local Economic Profile

This section provides context for the economic and fiscal impact assessments to follow by profiling the local economy of McKean County.

Total Employment

Figure 6 depicts the trend in total employment in McKean County during the five-year period from March 2020 through March 2025. As these data show, total employment in the county experienced a decline at the beginning of the period due to a decrease in economic activity associated with the COVID-19 pandemic. Total employment has since rebounded and remained generally stable but has not yet recovered from pre-pandemic levels. As of March 2025, total employment in the county stood at 13,655 jobs, which represents an overall decrease in employment of 3.4 percent (or 478 jobs) over the five-year period. To put this number in perspective, over this same period, total statewide employment in Pennsylvania increased by 2.7 percent.[15]

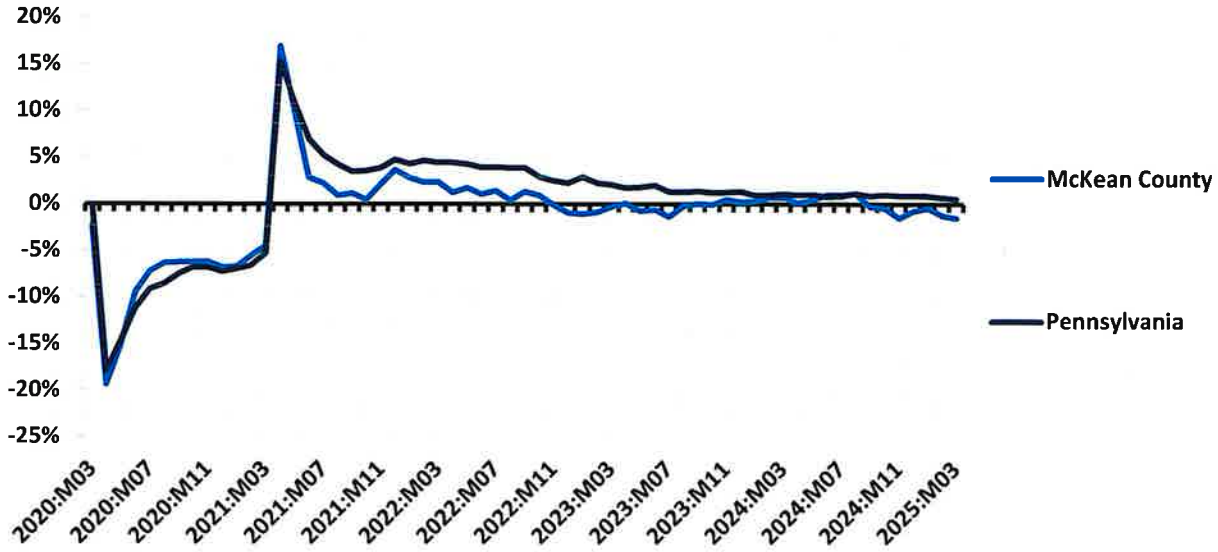
Figure 6: Total Employment in McKean County – March 2020 to March 2025[16]



To control for seasonality and provide a point of reference, Figure 7 compares the year-over-year change in total employment in McKean County to that of the state of Pennsylvania over the same five-year period. Any point above the zero line in this graph indicates an increase in employment, while any point below the zero line indicates a decline in employment. As these data show, McKean County tracked slightly below the statewide average during most of the period. As of March 2025, the year-over-year change in total employment in McKean County was minus 1.5 percent as compared to 0.6 percent statewide in Pennsylvania.

[15] Data Source: U.S. Bureau of Labor Statistics.
[16] Data Source: U.S. Bureau of Labor Statistics.

Figure 7: Year-Over-Year Change in Total Employment – March 2020 to March 2025[17]



Employment and Wages by Industry Supersector

To provide a better understanding of the underlying factors motivating the total employment trends depicted in Figures 6 and 7, Figures 8 through 10 provide data on private employment and wages in McKean County by industry supersector.[18]

Figure 8 provides an indication of the distribution of private sector employment across industry supersectors in McKean County in 2024. As these data indicate, the county's largest industry sectors that year were Manufacturing (2,884 jobs), followed by Education and Health Services (2,533 jobs), and Trade, Transportation and Utilities (2,412 jobs).

Figure 9 provides a similar ranking for average private sector weekly wages by industry supersector in McKean County in 2024. As these data show, the highest paying industry sectors that year were Natural Resources and Mining ($1,578 per week), Manufacturing ($1,275 per week), and Information ($1,196 per week). To provide a point of reference, the average private sector weekly wage across all industry sectors in McKean County that year was $948 per week.

[17] Data Source: U.S. Bureau of Labor Statistics.
[18] A "supersector" is the highest level of aggregation in the coding system that the Bureau of Labor Statistics uses to classify industries.

Figure 8: Private Employment by Industry Supersector in McKean County – 2024[19]

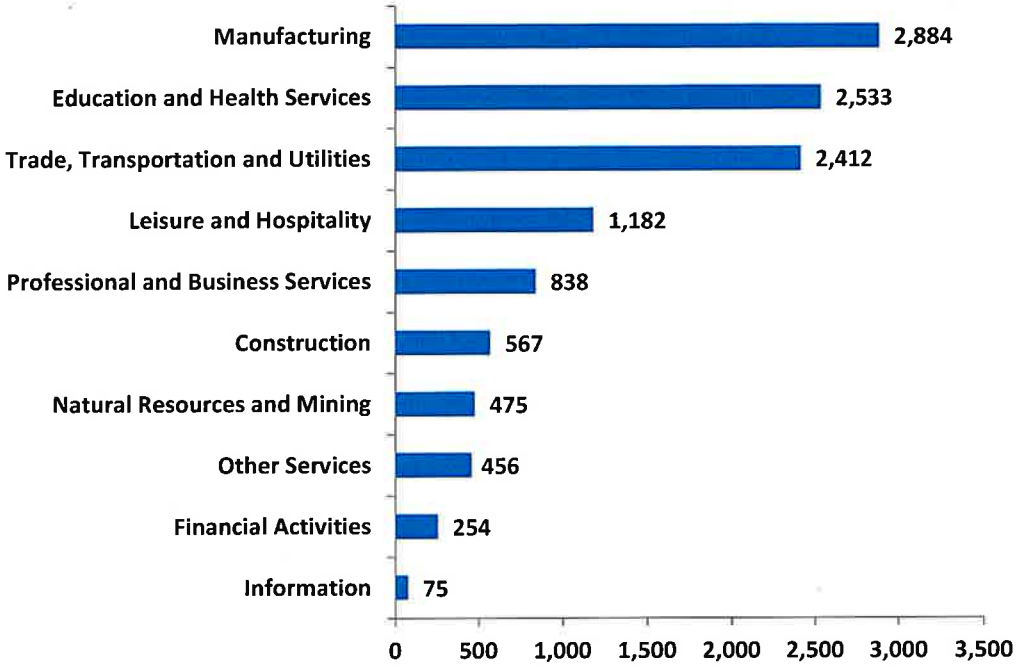
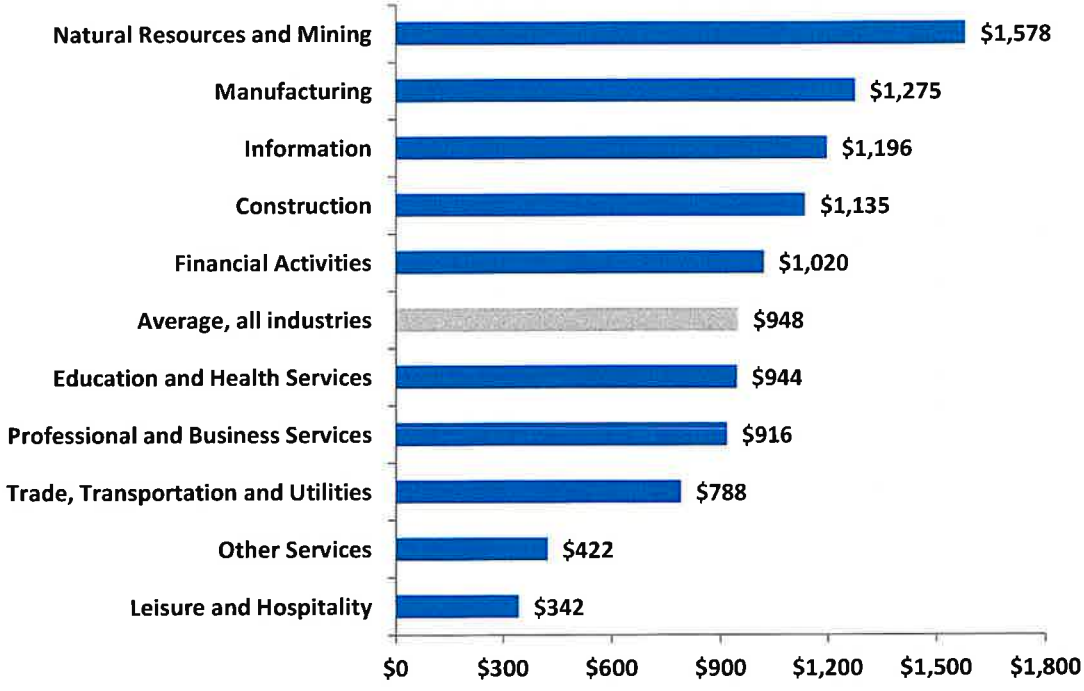


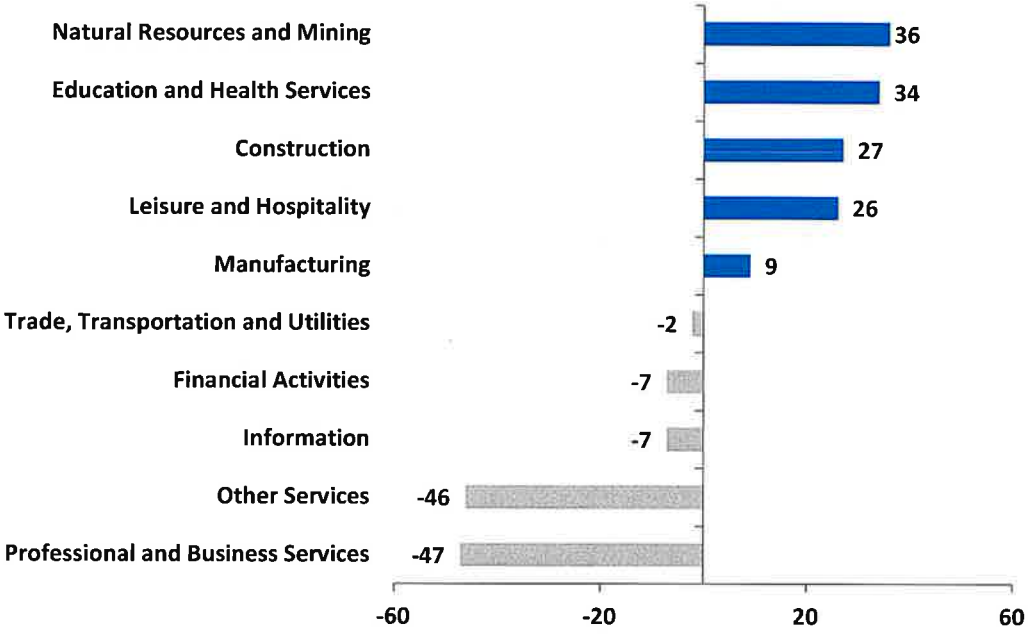
Figure 9: Average Private Weekly Wages by Industry Supersector in McKean County – 2024[20]



[19] Data Source: U.S. Bureau of Labor Statistics.
[20] Data Source: U.S. Bureau of Labor Statistics

Figure 10 details the year-over-year change in private sector employment from 2023 to 2024 in McKean County by industry supersector. Over this period, the largest employment gains occurred in the Natural Resources and Mining (up 36 jobs), Education and Health Services (up 34 jobs), and Construction (up 27 jobs) sectors. The largest employment losses occurred in the Professional and Business Services (down 47 jobs) and Other Services (down 46 jobs) sectors.

Figure 10: Change in Private Employment by Industry Supersector in McKean County from 2023 to 2024[21]

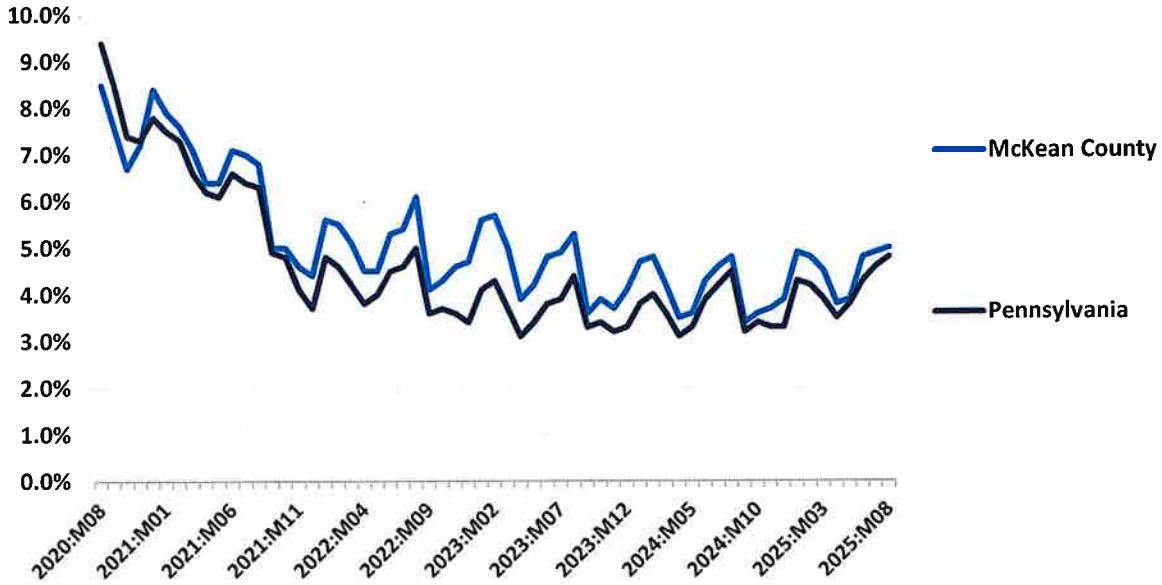


Unemployment

Figure 11 illustrates the trend in McKean County's unemployment rate over the five-year period from August 2020 through August 2025 and benchmarks those data against the statewide trend for Pennsylvania. As these data show, at the beginning of the period, the county and state experienced high unemployment rates as a result of the labor dislocations caused by the COVID-19 pandemic. Throughout the period, unemployment rates in McKean County tracked slightly higher than the statewide trend. As of August 2025, unemployment stood at 5.0 percent in McKean County and at 4.8 percent in Pennsylvania.

[21] Data Source: U.S. Bureau of Labor Statistics.

Figure 11: Unemployment Rate – August 2020 to August 2025[22]



[22] Data Source: U.S. Bureau of Labor Statistics.

Economic Impact

This section quantifies the economic and fiscal contribution that the proposed Stargazer project would make to McKean County and to the state of Pennsylvania. The analysis separately evaluates the pulse of economic activity that would occur during the construction phase of the project, as well as the annual economic activity that the project would generate during its ongoing operational phase.

Method

To empirically evaluate the likely local economic impact attributable to the proposed Stargazer project, the analysis employs a regional economic impact model called IMPLAN.[23] The IMPLAN model is one of the most commonly used economic impact simulation models in the U.S., and is used by universities, state agencies, and research institutes. Like all economic impact models, the IMPLAN model uses economic multipliers to quantify economic impact.

Economic multipliers measure the ripple effects that an expenditure generates as it makes its way through the economy. For example, as when the Stargazer project purchases goods and services – or when contractors hired by the facility use their salaries and wages to make household purchases – thereby generating income for someone else, which is in turn spent, thereby becoming income for yet someone else, and so on, and so on. Through this process, one dollar in expenditures generates multiple dollars of income. The mathematical relationship between the initial expenditure and the total income generated is the economic multiplier.

One of the primary advantages of the IMPLAN model is that it uses regional and national production and trade flow data to construct region-specific and industry-specific economic multipliers, which are then further adjusted to reflect anticipated actual spending patterns within the specific geographic study area that is being evaluated. As a result, the economic impact estimates produced by IMPLAN are not generic. They reflect as precisely as possible the economic realities of the specific industry, and the specific study area, being evaluated.

In the analysis that follows, these impact estimates are divided into three categories. First-round direct impact measures the direct economic contribution of the entity being evaluated (e.g., own employment, wages paid, goods and services purchased by the Stargazer project). Second-round indirect and induced impact measures the economic ripple effects of this direct impact in terms of business to business, and household (employee) to business, transactions. Total impact is simply the sum of the preceding two. These categories of impact are then further defined in terms of employment (the jobs that are created), labor income (the wages and benefits associated with those jobs), and economic output (the total amount of economic activity that is created in the economy).

[23] IMPLAN is produced by IMPLAN Group, LLC.

Construction Phase

This portion of the section assesses the economic and fiscal impact that the pulse of economic activity associated with construction of Stargazer would have on McKean County and the state of Pennsylvania.

Economic Impact Assumptions

The analysis is based on the following assumptions:

- Total capitalized investment associated with Stargazer is estimated to be approximately $936.5 million. Of that total: [24]
  - Engineering, site preparation, and other construction and development costs are estimated to be approximately $598.7 million.
  - Capital equipment costs are estimated to be approximately $337.7 million.
- Stargazer would support approximately 1,500 local and non-local construction jobs during a representative 12-month period.[25]
- For ease of explanation, all construction expenditures are assumed to take place during a representative 12-month period.

Economic Impact on McKean County

As shown in Table 1, based on the analysis, construction of Stargazer would directly provide a pulse of economic activity supporting approximately: 1) 70 jobs, 2) $9.3 million in wages and benefits, and 3) $15.5 million in economic output to McKean County (in 2025 dollars).

Taking into account the economic ripple effects that direct investment and the per diem spending of non-local construction workers would generate, the total estimated impact on McKean County would support approximately: 1) 276 jobs, 2) $16.3 million in wages and benefits, 3) $41.4 million in economic output, and 4) $0.9 million in local tax revenue (in 2025 dollars).

[24] Data Source: RWE. Investment estimate is subject to change based on final design and vendor contracts.
[25] Data Source: Derived from data provided by RWE.

Table 1: Estimated Economic and Fiscal Impact on McKean County from Construction of Stargazer (2025 Dollars)[26,27,28]

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	70	$9,323,700	$15,539,600
2nd Round Indirect and Induced Economic Activity	206	$7,017,800	$25,820,000
Total Economic Activity	**276**	**$16,341,500**	**$41,359,500**
Fiscal Impact[29]			
Total Local Tax Revenue			**$855,500**

**Totals may not sum due to rounding.*

Economic Impact on Pennsylvania

(Includes McKean County impact)

As shown in Table 2, construction of Stargazer would directly provide a pulse of economic activity supporting approximately: 1) 737 jobs, 2) $110.5 million in wages and benefits, and 3) $226.8 million in economic output to the state of Pennsylvania as a whole (in 2025 dollars).

Taking into account the economic ripple effects that direct investment and the per diem spending on non-local construction workers would generate, the total estimated impact on the state of Pennsylvania would support approximately: 1) 1,805 jobs, 2) $183.6 million in wages and benefits, 3) $439.0 million in economic output, and 4) $16.8 million in state and local tax revenue (in 2025 dollars).

[26] Construction sector jobs are not necessarily new jobs, but the investments made can also support a job during the construction of the project. Please note that it is not possible to know with certainty what proportion of these jobs would go to county or state construction contractors or be filled by county or state residents.
[27] One construction job equals one person working full-time for one year. Since construction schedules and daily on-site employment vary, the analysis converts these variations into a consistent, full-time job.
[28] Wages and Benefits are included in the Economic Output associated with the project.
[29] The one-time tax revenue generated from economic activity associated with construction consists of estimates based on the calculations provided in the IMPLAN analysis. Local tax revenue includes collections from all local taxing jurisdictions within the county.

Table 2: Estimated Economic and Fiscal Impact on the State of Pennsylvania from Construction of Stargazer (2025 Dollars)

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	737	$110,495,500	$226,764,900
2nd Round Indirect and Induced Economic Activity	1,068	$73,146,500	$212,214,000
Total Economic Activity	**1,805**	**$183,642,000**	**$438,978,900**
Fiscal Impact[30]			
Local Tax Revenue			**$6,792,800**
State Tax Revenue			**$9,996,000**
Total State and Local Tax Revenue			**$16,788,800**

**Totals may not sum due to rounding.*

Ongoing Operations Phase

This portion of the section assesses the annual economic impact that Stargazer would provide to McKean County and the state of Pennsylvania during its anticipated 40-year operational phase.

Economic Impact Assumptions

The analysis is based on the following assumptions:

- Stargazer would employ approximately 10 full-time employees and would source locally and statewide available services and materials for maintenance of the facility.[31]

Economic Impact on McKean County

Applying these assumptions in the IMPLAN model results in the following estimates of annual economic impact on McKean County. As shown in Table 3, annual operation of Stargazer would on average directly support approximately: 1) 10 jobs, 2) $1.2 million in wages and benefits, and 3) $3.8 million in economic output to McKean County (in 2025 dollars).

Taking into account the economic ripple effects that direct impact would generate, the total estimated annually supported impact on McKean County would be approximately: 1) 19 jobs, 2) $1.6 million in wages and benefits, and 3) $5.2 million in economic output (in 2025 dollars).

[30] The one-time tax revenue generated from economic activity associated with construction consists of estimates based on the calculations provided in the IMPLAN analysis. Local tax revenue includes collections from all local taxing jurisdictions within the state benefiting from the project.
[31] Data Source: RWE. Subject to change based on vendor contracts.

Table 3: Estimated Annual Economic Impact on McKean County from the Ongoing Operation of Stargazer (2025 Dollars)

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	10	$1,242,000	$3,813,100
2nd Round Indirect and Induced Economic Activity	9	$396,800	$1,397,600
Total Economic Activity	**19**	**$1,638,800**	**$5,210,700**

**Totals may not sum due to rounding.*

Economic Impact on Pennsylvania

(Includes McKean County impact)

Applying these assumptions in the IMPLAN model results in the following estimates of annual economic impact on the state of Pennsylvania. As shown in Table 4, annual operation of Stargazer would directly support approximately: 1) 10 jobs, 2) $1.2 million in wages and benefits, and 3) $3.9 million in economic output to the state of Pennsylvania (in 2025 dollars).

Taking into account the economic ripple effects that direct impact would generate, the total estimated annually supported impact on the state of Pennsylvania would be approximately: 1) 27 jobs, 2) $2.3 million in wages and benefits, and 3) $6.9 million in economic output (in 2025 dollars).

Table 4: Estimated Annual Economic Impact on the State of Pennsylvania from the Ongoing Operation of Stargazer (2025 Dollars)

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	10	$1,242,000	$3,910,100
2nd Round Indirect and Induced Economic Activity	17	$1,037,800	$3,011,600
Total Economic Activity	**27**	**$2,279,800**	**$6,921,700**

**Totals may not sum due to rounding.*

Fiscal Impact

This section quantifies the direct fiscal contribution that the proposed Stargazer project would make to McKean County and its local taxing jurisdictions. It should be noted at the outset, however, that the analysis that follows likely understates the actual fiscal impact that Stargazer would have on the county as it only accounts for the direct fiscal impact that the project would generate. It does not take into account any additional tax revenue that would be generated as a result of the indirect economic activity attributable to the ongoing operation of Stargazer.

Fiscal Impact Assumptions

The analysis is based on the following assumptions:

- Stargazer would be situated on approximately 3,225 actively used, fenced-in acres.[32]
- The fenced-in acreage would be removed from the Clean and Green (C&G) Program and reassessed at an estimated solar use market value of $10,000 per acre.[33]
- The fenced-in acreage would be located in Smethport Area School District and distributed across the three townships as follows: 4 percent in Hamlin Township, 13 percent in Norwich Township, and 84 percent in Sergeant Township.[34]
- Stargazer would have an operational life of approximately 40 years.[35]
- The solar panels, equipment, and foundations are not considered real property and would not be taxed.[36]
- Millage rates and assessment values remain constant throughout the analysis.

Taxation of Real Estate

Table 5 details the increased tax revenue associated with removing the affected acreage from the Clean and Green Program and reassessing the land as solar use property. The local real estate tax revenue from the project after reassessment is estimated to be approximately $44.7 million over the project's anticipated 40-year operational life, including the one-time rollback taxes of approximately $1.0 million (in 2025 dollars).

This cumulative total consists of approximately $17.8 million in McKean County revenue, approximately $0.2 million in Hamlin Township revenue, approximately $0.3 million in Norwich Township revenue,

[32] Data Source: RWE.
[33] Data Source: Estimated market value provided by RWE. Future assessment values for Stargazer are currently unknown. Actual assessment value may vary.
[34] Data Source: RWE. Estimated distribution based on preliminary layout. Subject to change based on final design.
[35] Data Source: RWE.
[36] Pursuant to Pennsylvania Statutes Title 53 Pa C.S.A. §8811 and Title 72 P.S. §5020-201. Assumes equipment is considered industrial machinery and equipment.

approximately $0.4 million in Sergeant Township revenue, and approximately $26.0 million in Smethport Area School District (SD) revenue (in 2025 dollars).

Table 5: Estimated Local Revenue Generated by Stargazer from Taxation of Real Estate Over 40 Years (2025 Dollars)

	McKean County	Hamlin Township	Norwich Township	Sergeant Township	Smethport Area SD	Total
Estimated Assessed Value – Solar Use[37,38]						$32,254,200
Millage Rate (per $1,000)[39]	13.50	4.80	2.00	0.375	19.69	-
Annual Real Estate Tax – Solar Use	$435,400	$5,500	$8,100	$10,100	$635,100	$1,094,300
Cumulative Revenue	**$17,417,300**	**$219,300**	**$324,300**	**$405,900**	**$25,403,400**	**$43,770,200**
One-time Rollback Taxes[40]	$368,400	$5,000	$7,500	$9,300	$584,900	$975,100
Total Cumulative Revenue	**$17,785,600**	**$224,400**	**$331,800**	**$415,200**	**$25,988,300**	**$44,745,300**

**Totals may not sum due to rounding.*

Community Benefit Agreement

Community benefit agreements can add significant value to the overall fiscal impact of solar projects to their host localities. RWE intends to pursue community benefit agreements with the associated townships, providing a combined annual contribution of approximately $750 per megawatt (MW) alternating current (AC) of project capacity located in each township. The estimated combined township contribution would be approximately $360,000 per year, resulting in a cumulative total of approximately $14.4 million over the project's anticipated 40-year operational life.[41]

This additional local revenue is excluded from the analysis as the final contribution is subject to negotiation between Stargazer and its host localities.

[37] Data Source: RWE and McKean County's GIS property record database.
[38] McKean County Assessor's office. Property is assessed at 100 percent of fair market value.
[39] Data Source: McKean County Assessor's office. 2025 Property Millage Rates.
[40] Rollback taxes are estimated based on the difference between the current C&G value assessment tax and the tax on the fair market value for six complete tax years plus the current year, plus simple interest.
[41] Data Source: RWE.

Relative Comparisons

Table 6 compares the total annual McKean County real estate tax revenue generated by Stargazer to McKean County's current highest property taxpayers. As indicated in Table 6, Stargazer's estimated annual McKean County tax revenue of approximately $0.4 million would make it the highest contributing "taxpayer" in McKean County based on 2025 assessments. Stargazer would provide more than twice as much revenue as the county currently collects annually from its highest taxpayer, Zippo Manufacturing Company, and more than three times as much revenue as each of the county's remaining taxpayers.

Table 6: Highest Property Taxpayers in McKean County (2025) and Stargazer's Estimated Annual McKean County Tax Revenue[42,43]

Rank	Taxpayer	Annual Tax Amount
	Stargazer's Estimated Annual Contribution	**$435,400**
1	Zippo Manufacturing Company	$161,055
2	The Lyme Timber Company	$137,342
3	Bradford Hospital	$121,452
4	Bradford Ecumenical Home	$70,403
5	American Refining Group	$65,629
6	Georgia-Pacific Panel Products LLC	$58,769
7	The Rossi Group LLC	$55,203
8	Casella Waste Management LLC	$54,112
9	Wal-Mart Associates Inc	$54,036
10	Ardagh Group	$49,220

[42] Data Source: RWE and McKean County Assessor's office.
[43] Derived from data provided by McKean County's GIS property record database. Current estimated tax revenues account for all parcels owned by the associated businesses. Totals may vary if parcel ownership is recorded under other entity names.

Current Use

This section provides a benchmark for the previous estimates of the economic and fiscal impact that the proposed Stargazer project would have on McKean County by estimating the economic and fiscal impact that the site has on the county in its current use.

Economic Impact Assumptions

The analysis is based on the following assumptions:

- Stargazer would be situated on an approximate 3,225-acre tract of timberland.[44]

Economic Impact

Applying these assumptions in the IMPLAN model results in the following estimates of annual economic impact. As shown in Table 7, in its current use, the project site on average directly supports approximately: 1) 2 jobs, 2) $0.2 million in wages and benefits, and 3) $0.2 million in economic output to McKean County (in 2025 dollars).

Taking into account the economic ripple effects that direct impact generates, on average, the total annually supported impact on McKean County is approximately: 1) 3 jobs, 2) $0.2 million in wages and benefits, and 3) $0.3 million in economic output (in 2025 dollars).

Table 7: Estimated Annual Economic Impact of the Project Site on McKean County – Current Use (2025 Dollars)[45]

Economic Impact	Employment	Wages and Benefits	Economic Output
1st Round Direct Economic Activity	2	$174,400	$197,200
2nd Round Indirect and Induced Economic Activity	1	$34,100	$96,000
Total Economic Activity	**3**	**$208,500**	**$293,300**

**Totals may not sum due to rounding.*

[44] Data Source: RWE.
[45] Calculations based data from the U.S. Department of Agriculture and IMPLAN Group, LLC for Pennsylvania and McKean County.

Fiscal Impact Assumptions

The analysis is based on the following assumptions:

- The current assessment value of the affected acreage is approximately $0.6 million.[46]

Fiscal Impact

Table 8 details the estimated local real estate tax revenue that the project site generates in its current use. As the data in Table 8 indicate, the current local real estate tax revenue from the project site is estimated to be approximately $20,500 per year, for a cumulative total of approximately $0.8 million over 40 years. This cumulative total consists of approximately $0.3 million in McKean County revenue, approximately $4,100 in Hamlin Township revenue, approximately $6,100 in Norwich Township revenue, approximately $7,600 in Sergeant Township revenue, and approximately $0.5 million in Smethport Area School District (SD) revenue (in 2025 dollars).

Table 8: Estimated Local Revenue Generated by the Project Site from Taxation of Real Estate Over 40 Years – Current Use (2025 Dollars)

	McKean County	Hamlin Township	Norwich Township	Sergeant Township	Smethport Area SD	Total
Estimated Assessed Value – Current Use						$604,300
Millage Rate (per $1,000)	13.50	4.80	2.00	0.375	19.69	-
Annual Real Estate Tax – Current Use	$8,200	$100	$150	$190	$11,900	$20,500
Cumulative Revenue	**$326,300**	**$4,100**	**$6,100**	**$7,600**	**$475,900**	**$820,000**

**Totals may not sum due to rounding.*

The estimates provided in this report are based on the best information available and all reasonable care has been taken in assessing the quality of that information. However, because these estimates attempt to foresee the consequences of circumstances that have not yet occurred, it is not possible to be certain that they will be representative of actual events. These estimates are intended to provide a good indication of likely future outcomes and should not be construed to represent a precise measure of those outcomes.

[46] Data Source: McKean County's GIS property record database.