ATTACHMENT H: VISUAL RESOURCES TECHNICAL REPORT

Hop Hill Solar Energy Project
Visual Resources Technical Report

OCTOBER 2022

PREPARED FOR

HOHI bn, LLC

PREPARED BY

SWCA Environmental Consultants

HOP HILL SOLAR ENERGY PROJECT
VISUAL RESOURCES TECHNICAL REPORT

Prepared for

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) has been contracted by HOHI bn, LLC (Applicant), a subsidiary of BrightNight, LLC, to evaluate the existing conditions of the landscape within and surrounding the proposed Hop Hill Solar Energy Project (project). This technical report focuses on the potential visual impacts associated with the construction, operation, maintenance and decommissioning of the proposed Hop Hill Solar Energy Project. The project is proposed to be constructed on unincorporated rural lands in Benton County, Washington.

While this project is not proposed to occur on Bureau of Land Management (BLM) regulated land, to provide a systematic basis for evaluating impacts to visual resources resulting from the construction and operation of the proposed project, the assessment was conducted based on the BLM's Visual Resources Management (VRM) system and adapted this system to fit project assessment needs. BLM Form 8400-1, Visual Contrast Rating form, (BLM 1984) was adapted for project purposes and used to document the potential visual contrast of the proposed project components to the surrounding landscape (Appendix A). The BLM's process is considered an industry standard and is often applied to non-BLM visual assessments to provide project proponents and authorizing agencies a consistent and translatable methodology for understanding visual impacts from proposed projects.

This technical report includes the project overview, analysis methods, characterization of potential visual impacts, and recommended mitigation measures to reduce visual impacts.

1.1 Project Description

HOHI bn, LLC (HOHI or Applicant), a subsidiary of BrightNight, LLC, is proposing to develop the Hop Hill Solar Energy project, a utility-scale photovoltaic solar power plant in Benton County, Washington. The siting area, which encompasses the boundary of the leased parcels for the project, covers approximately 22,725 acres and is located on rural land in unincorporated Benton County, approximately 11 miles north of the city of Prosser (Figure 1). The siting area includes a solar array siting area to the south (11,180 acres) and a transmission line corridor siting area to the north (11,545 acres) (Figure 2). The final project area subject to development within the siting area is anticipated to be approximately 5,000 acres. The siting area and vicinity are characterized by rural rangeland and agricultural lands with limited residential or commercial development. HOHI is considering various design layouts for the solar arrays within the siting area and is in the process of narrowing down the final "buildable" project area, which will be based on the results of site evaluations such as geotechnical investigations, review of sensitive natural and cultural resources, and the overall slope and aspect of the project area.

The following sections describe the project location, a detailed description of the proposed project action and no action alternative, as proposed in the March 2022 Hop Hill Solar Energy Project (CUP) Project Narrative document (SWCA 2022a) and the Plan of Development document (SWCA 2022b).

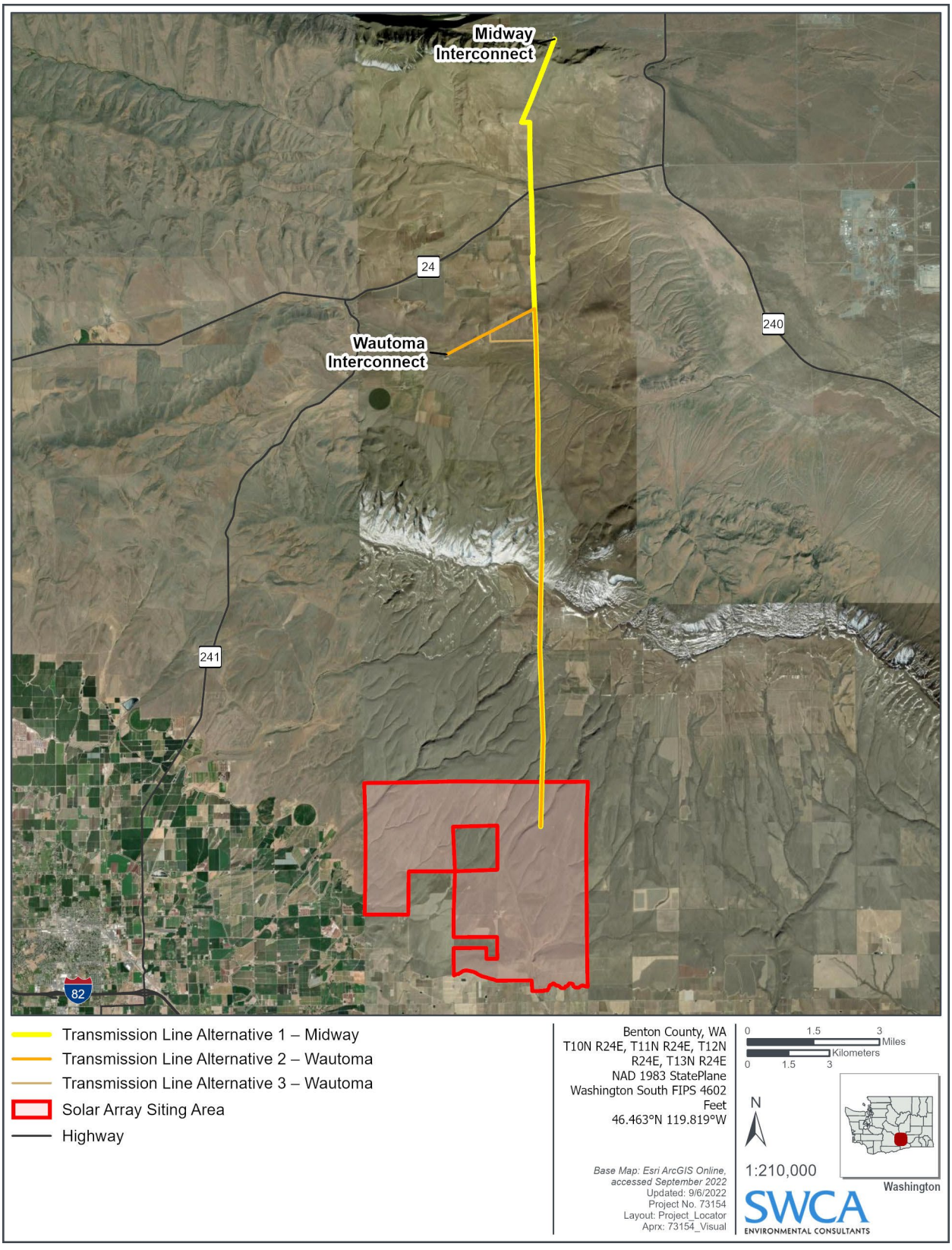

Figure 1. Siting area and transmission line corridor siting area.

1.1.1 Project Location

The proposed siting area is located on unincorporated land in Benton County, Washington, approximately 11 miles north of the city of Prosser. The general setting of the siting area and surrounding areas are characterized by rural rangeland and agricultural lands with limited residential or commercial development. The proposed siting area and transmission line corridor siting areas are illustrated below (see Figure 1).

1.1.2 Proposed Action

Proposed solar arrays are a linked collection of solar modules and are made up of multiple rows of solar modules, tracker systems, and associated electrical components, including cabling, inverters, and medium voltage transformers. The configuration of arrays varies depending on equipment type, size, and topography. Each solar array would consist of multiple solar modules and racking systems. Each tracker would be supported by multiple steel posts, which could be round, hollow posts or pile-type posts (e.g., H-pile, C-pile, or S-pile). Each solar array would consist of either solar trackers or fixed support structures. Array panels would be approximately 7 feet in length, 3 to 4 feet wide, and between 1 and 2 inches thick with a posted height of between 5 and 7 feet, not exceeding more than 14 feet above ground level once installed to the supporting solar array frames and posts. Post depth may vary depending on soil conditions. Post locations would be determined by the final layout of the tracker system and geotechnical investigations of the project area.

The project could require the construction of a new onsite O&M facility. This new O&M facility, if constructed, would be a prefabricated steel building up to 1,600 square feet in area. The O&M facility site could occupy up to approximately 2 acres, including an on-site gravel area for parking and an open staging area. An additional structural facility would be constructed to house the infrastructure for the BESS, which would be housed inside a prefabricated metal container or within a building. Permanent outdoor lighting would be provided at the O&M facility; portable lighting may also be required for some maintenance activities that must be performed at night. Lighting would be kept to the minimum required for safety and security. Lighting would be attached to buildings and other structural supports where possible or affixed to ground-mounted poles approximately 15 to 20 feet high.

The Hop Hill's primary point of interconnection (POI) is the BPA 230-kilovolt (kV) Midway Substation, with a secondary POI of the BPA 500-kV Wautoma Substation. The proposed transmission infrastructure would be placed in the transmission line corridor siting area. The route to connect to the Transmission Line Alternative 1, the Midway Interconnect would be approximately 17 miles long , and the route to connect to the Transmission Line Alternative 2, the Wautoma Interconnect, would be approximately 12 miles long (shown in Figure 1). Both alternatives would generally follow the same north-south route for approximately 12 miles before diverging towards one of the two substations. An alternative connection to the Wautoma Substation, Transmission Line Alternative 3 (shown in Figure 1), is being considered that would diverge from the north-south route after approximately 11 miles and head directly west for approximately 1 mile, then turn north and connect to the previously suggested transmission line route and follow the previously suggested route west again to connect to the substation. The routes are shown on the maps in Section 1.4, Viewshed Analysis, below. The connecting transmission lines would be either metal single pole single circuit or H-Frame construction depending on the location need; transmission poles would not exceed 100 feet in height.

The entire solar array siting area would be fenced to appropriately restrict public access during construction and operations. Chain-link security fencing is currently proposed to be installed around the site perimeter, substation, and other areas requiring controlled access. The security fence proposed would

be approximately 7 feet tall, including approximately 1 foot of barbed wire (three strands) mounted on 45-degree extension arms.

Grading and leveling would be done only in the areas where the topography would need to be changed within the solar array siting area to accommodate the tracker/racking system tolerances, site drainage, roads, laydown areas, and foundations (e.g., concrete foundations used for inverter equipment, substations, drainage facilities, and other structures). Mowing and vegetation removal would occur as a part of site clearing, grading, and excavation process.

The project would have a useful life of approximately 40 years. After 40 years, the continued feasibility of the project and the integrity of structures associated with the project would be evaluated for continued use or termination. Prior to termination, the project proponent would prepare a site-specific Decommissioning and Site Reclamation Plan. It is anticipated that if the project is terminated following the 40-year usefulness period, any disturbed lands associated with the project would be reclaimed. The Decommissioning and Site Reclamation Plan would provide detail regarding the removal of all project components, reuse of materials to the extent feasible, and site restoration activities to pre-project specifications. The Decommissioning and Site Reclamation Plan would discuss all currently applicable laws, ordinances, regulations, and standards associated with the reuse, safe storage, or disposal of project materials.

1.1.3 No Action Alternative

Under the No Action Alternative, the project would not be constructed and there would be no new visual impacts to the existing landscape character and land uses in the project area would continue as currently existing (see Section 1.4).

1.2 Methods

This technical report follows four steps to assess the impacts to the visual environment: 1) define analysis area based on a viewshed analysis from the siting area to determine areas from where the project may be visible; 2) describe existing landscape character within the analysis area to identify impacts from the introduction of project components within the landscape; 3) use the viewshed analysis to identify key observation points (KOPs) from where the project may be viewed; and 4) complete contrast rating worksheets based on field observations incorporating environmental factors with supporting photographic simulations from each KOP to assess the effects of project activities and development of proposed project components.

1.3 Viewshed Analysis

A viewshed analysis for the project was developed to illustrate where, in the surrounding landscape, the project would theoretically be visible (Figure 2 though Figure 5). The viewshed analysis includes a 5-mile radius around the solar array siting area (see Figure 2) and a 3-mile radius from the transmission line corridors to the Midway Substation (see Figure 3) and the Wautoma Substation (see Figure 4 and Figure 5). Our analysis focused around the solar array siting area and the transmission line corridors as this is the area where the concentration of visual components would be located. This is why the boundary outline in Figure 2 (showing the solar array siting area) is different from Figure 1 (showing the siting area). These figures represent the area in the surrounding landscape where potential visual effects from the project and surface disturbing activities may be discerned by the casual observer. Additional viewshed analyses were developed from each KOP individually to confirm potential project area visibility related to KOPs (see Appendix C).

Created using a geographic information system (GIS) software, the viewshed analysis models the approximate heights and locations of project components and incorporates those features into the existing landform to illustrate the areas from which the project would be potentially visible. This theoretical view is based on elevation and landform but does not account for vegetation, existing structures, and other landscape elements that could obstruct views. The viewshed analysis was used to assist in the identification of KOPs that represent common or sensitive points from which the project could be viewed.

1.4 Affected Environment

This section provides a base description for the existing landscape character and other factors currently influencing the proposed siting area at a regional and local level.

1.4.1 Regional Description

The proposed project would be located approximately 32 miles north of the southern border of Washington State. This area is characterized by abundant agricultural development in the valley areas and surrounding the Columbia River. With the abundance of water running though this drier region of the state, numerous towns and cities sprang up amid the natural rangeland. The landforms of this region begin with mountains and transition though undulating hills into valleys. Development has been concentrated in the valley floor. Due west of the siting area is Gifford Pinchot National Forest (approximately 100 miles) and Mount Rainier National Park (approximately 95 miles).

1.4.2 Local Description

The siting area is characterized by a low-lying valley to the south with undulating topography and hills to the north. Agricultural and rural residential development has spread outward from the major arterial roadway corridors, including State Highways 24, 240, 241, 225, and Interstate 82. Denser development follows Interstate 82 (I-82) (south of the project area), including Prosser approximately 7 miles to the southeast, Sunnyside approximately 6 miles to the west and Grandview approximately 5.5 miles to the southwest from the project. Matney Spring and the resulting Spring Creek begins just outside of the project area boundaries to the northeast and runs south though the siting area. Landscape colors in the area consist of light brown to tan and gray soils, with green and yellow-green vegetation primarily made up of grasses and sage in the natural rangeland areas. These naturally vegetated areas contrast with the lusher deep green vegetation of the agricultural areas and maintained vegetation that surrounds residences.

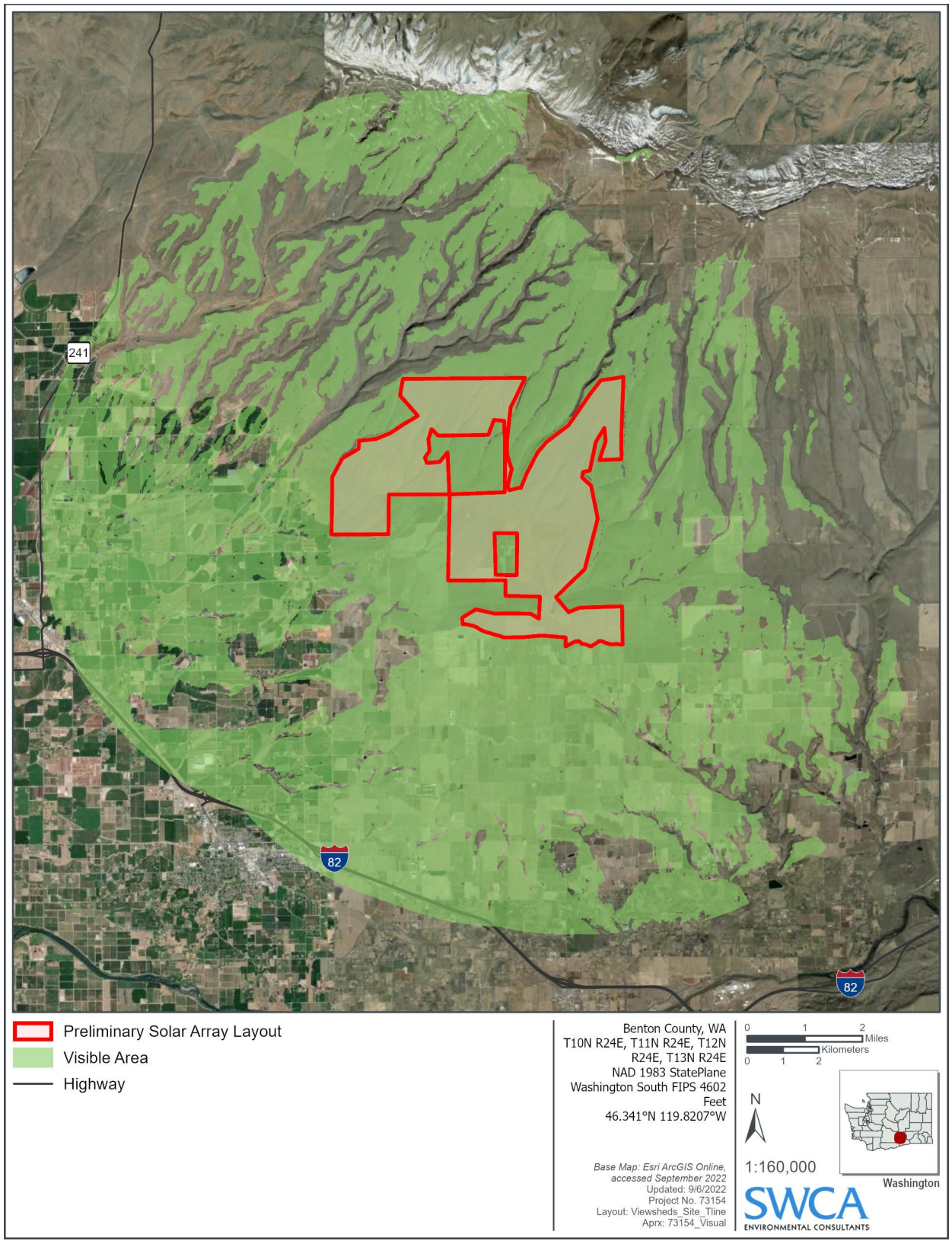

Figure 2. Viewshed analysis for the preliminary solar array layout.

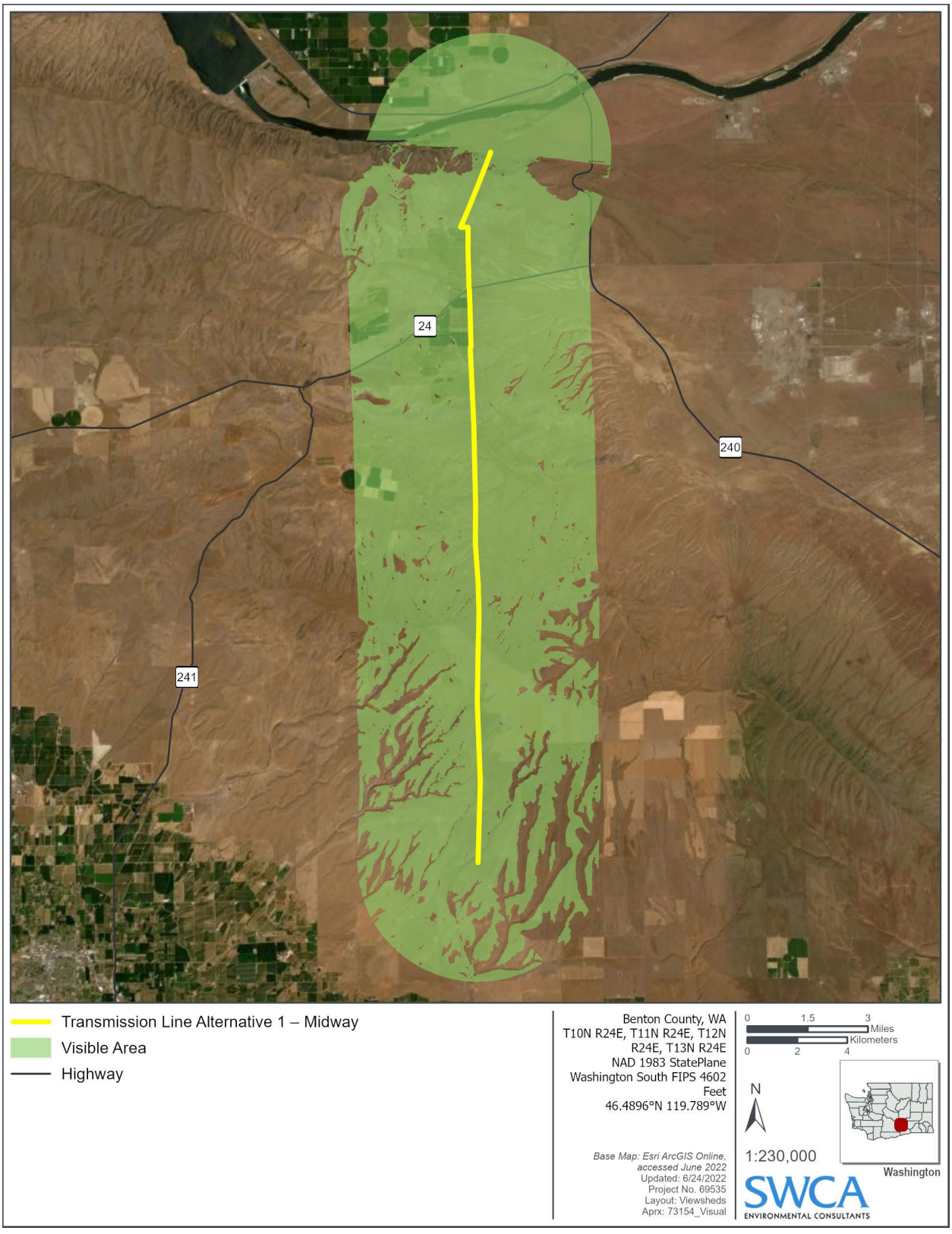

Figure 3. Viewshed analysis for the preliminary layout for the transmission line alternative 1 - Midway .

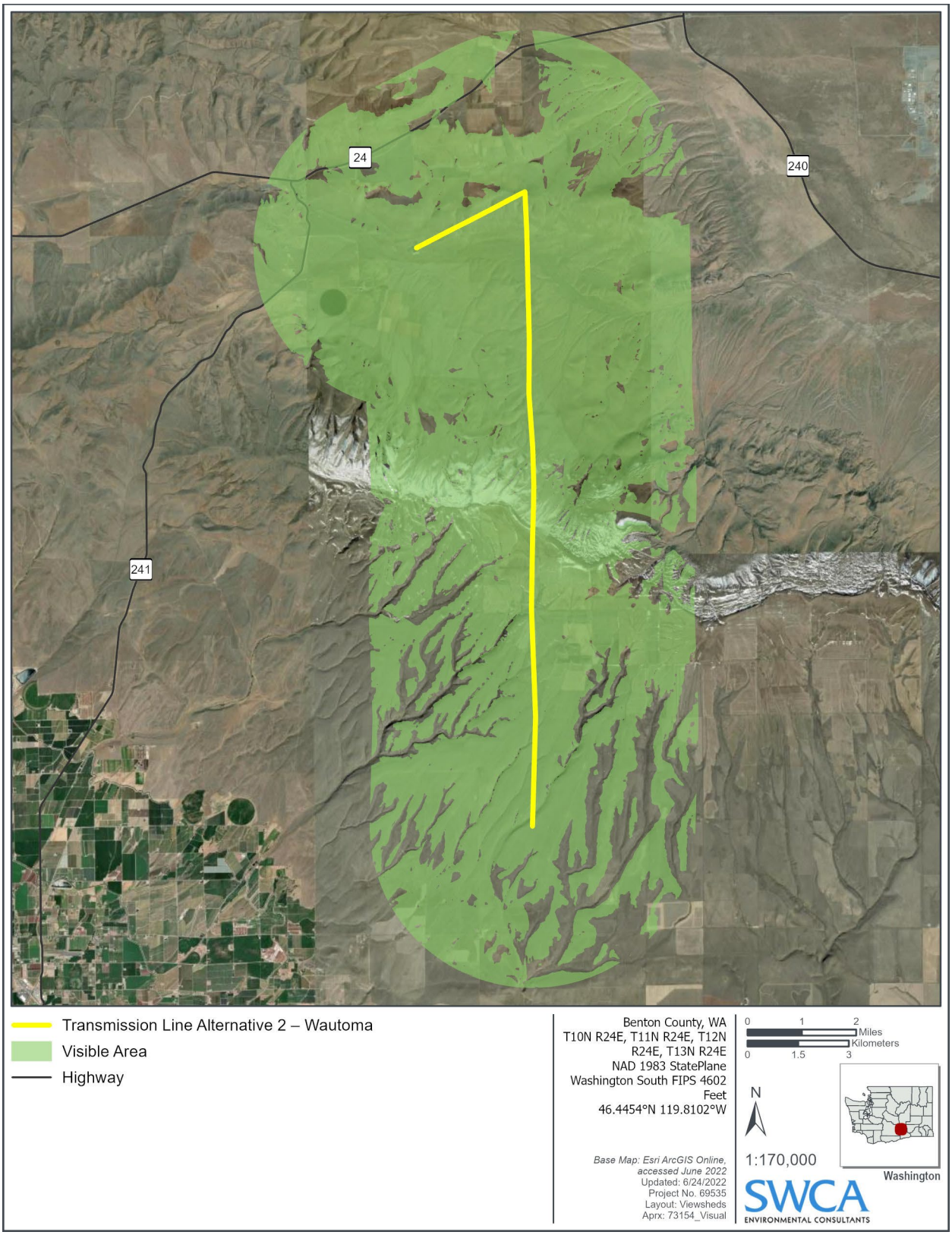

Figure 4. Viewshed analysis for the preliminary layout for the transmission line alternative 2 - Wautoma .

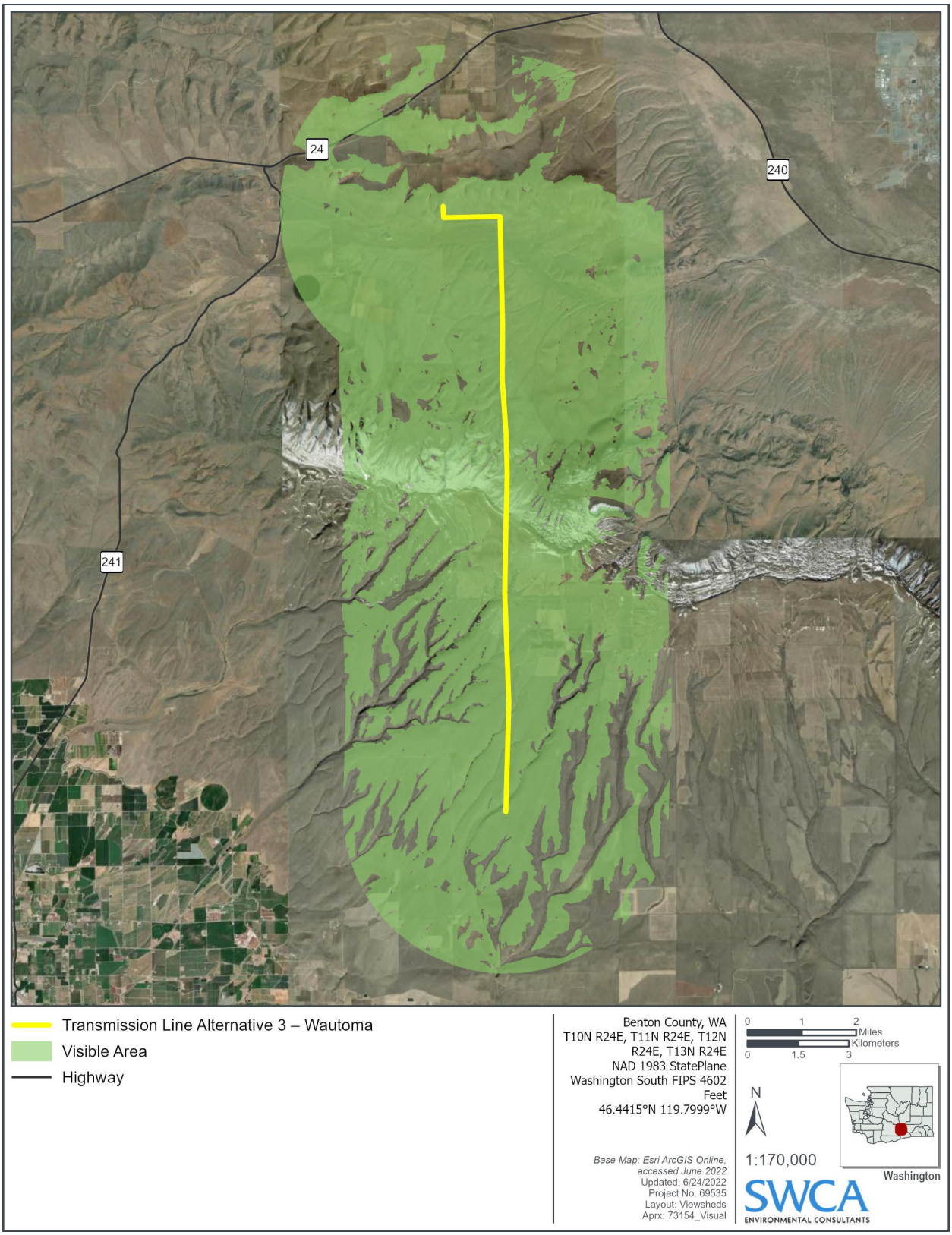

Figure 5. Viewshed analysis for the preliminary layout for the alternative transmission line 3 - Wautoma.

The majority of the siting area is privately owned. One state-owned parcel is surrounded by the land proposed for the solar site. The siting area and transmission corridor siting area are bordered on the north by federal lands within the Saddle Mountain National Wildlife Refuge, which is a part of Hanford Reach National Monument. One rural residence with multiple supporting residential and agriculture structures, which is located at the intersection of Anderson Road and North Missimer Road, is completely enclosed by the project solar array siting area. The project Applicant has indicated that there are no instillations planned for this residential area and has included a construction buffer around the residence to minimize potential disturbance. The project boundary is contained within Benton County's GMA AG zoning and comprehensive plan designation. Existing land uses within the project area include primarily rural rangeland and agriculture. Based on a review of National Land Cover Database land cover data, the project area is predominantly mapped as grassland/herbaceous, with smaller areas of scrub-shrub or cultivated crops.

1.5 Sensitive Viewing Platforms

Sensitive viewing platforms represent specific places, areas, and features that have visual importance relative to one's home, social areas, businesses, and recreation environment. They include viewing locations (KOPs) where the public would view the project both from a stationary (e.g., residential area) or a linear (e.g., major roadway) location. Potential changes in the viewshed are evaluated from these identified KOPs. Identification of KOPs for this analysis was based on a review of aerial photography and topographic maps, coordination with project clients, and field investigations. Analyzed sensitive viewing locations included:

- **Vehicular Travel Routes** – highways and roads used by origin/destination travelers, designated scenic or historic byways, and recreation destination roads (i.e., roads that provide access to designated recreation areas).

Nine KOPs were selected that represent typical viewing conditions from vehicular travel routes (Figure 6). While representative KOPs were not selected to focus on residential or recreational sensitive viewing platforms, it is anticipated that visual impacts to these viewers would be similar to the effects felt at selected vehicular KOPs. SWCA conducted in-field assessments on May 16 and 17, 2022, at each of the KOPs, implementing protocols and methods for contrast rating evaluation as provided in BLM Manual H-8431, Visual Resource Contrast Rating (BLM 1986b). Data collected at each of the KOPs included the following: GPS location, digital photographs (used for visual simulations), required information to complete the BLM's Visual Contrast Rating Worksheet, time of day and atmospheric conditions, and existing structures and roads in the viewshed.

There are numerous residential communities within or surrounding the analysis area consisting of rural, agricultural, or urban development. Some of the larger communities in this area include Sunnyside, Grandview, Benton, and Prosser. These cities and communities are connected primarily though Interstate 82 and Highways 22, 240, 241, and 225. KOPs were selected from these surrounding areas. The rationale for selection and a description of each KOP is described in Section 1.6.1.

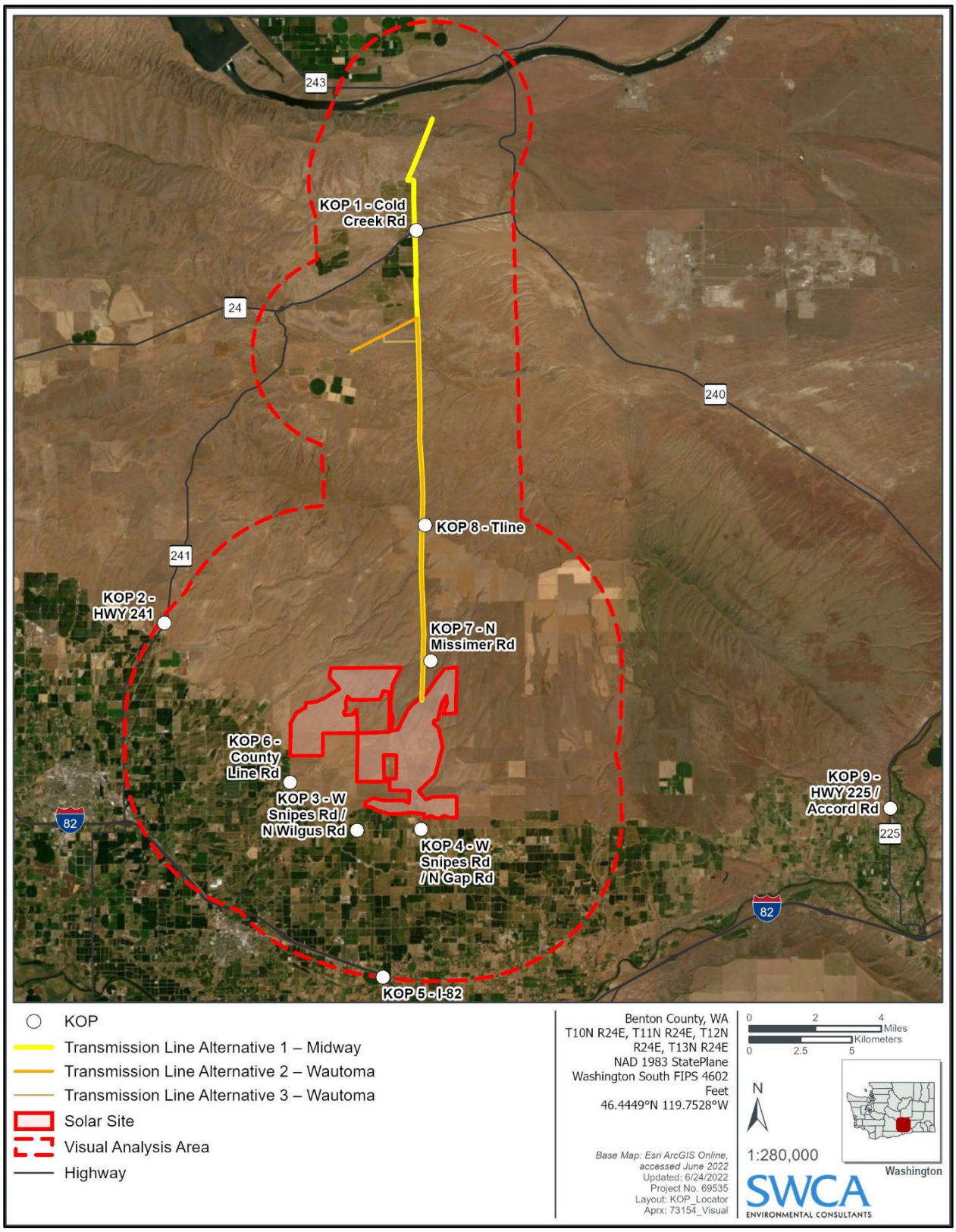

Figure 6. KOP locations and project visual analysis area.

1.5.1 Vehicular Travel Routes

The vehicular travel route KOPs that were chosen include local commercial and residential development and may have been considered as KOPs to represent residential areas. However, because of the importance of the roadways and the increased usage of the road to service these local commercial and residential areas along the roadways, it was determined that the primary sensitive viewer represented from these KOPs was vehicular travelers, both local and origin/destination travelers.

KOP 1 – Cold Creek Road/Highway 24 – Cold Creek Road/Highway 24 is the northern most KOP; here, there are a number of rural residences surrounded by agriculture, including some small local businesses like Sportfisher Orchards. These residences are separated by Highway 24, which runs primarily east to west. Residential and agricultural development are located on the west side of Cold Creek Road and natural rangeland on the east.

KOP 2 - Highway 241 (Hanford Road) – Hanford Road occurs to the southeast of the siting area. The two-lane road is surrounded by natural rangeland (primarily on the northern end) as well as agricultural and rural residential development (primarily on the southern end). Hanford Road connects with I-82 to the south, near the city of Sunnyside, and the northern end connects to Highway 24.

KOP 3 - West Snipes Road/ North Wilgus Road – This intersection of roads is located directly south of the siting area. These two roads serve as access roads to orchards and other agricultural development. These roads also service a number of rural residential homes. Both roads have existing transmission lines that run parallel to the roadways.

KOP 4 - West Snipes Road/ North Gap Road – North Gap Road splits off West Snipes Road and continues south. These roads serve as access to orchards and other agricultural development along with a few rural residences. Both roads have existing transmission line infrastructure that parallels the roadways.

KOP 5 - Interstate 82 – I-82 serves as a main arterial roadway though many of the more densely developed areas to the south of the siting area and facilitates origin/destination travelers. This KOP is approximately 5 miles directly south of the siting area and is surrounded by agricultural and residential areas as well as localized commercial development.

KOP 6 - County Line Road – County Line Road is located directly south of the southeastern corner of the siting area. This road serves as an access road to orchards and other agricultural development. County Line Road also serves a number of rural residential homes as well as industrial areas.

KOP 7 - North Missimer Road – North Missimer Road serves as access to the Matney Spring and Spring Creek as well as agricultural and rural development to the north of the siting area. This area has elevated views of the surrounding rangeland and distant views of residential and agricultural areas. Also viewable from this point is the town of Sunnyside as well as a distant views of Mount Hood to the west.

KOP 8 - Transmission Line – This area has multiple informal and undeveloped surrounding roads. There are also multiple agriculture fields directly to the east and south. This KOP area was selected to focus on the transmission line and its contrast with the surrounding natural environment.

KOP 9 - Highway 225 (Accord Road) – The area surrounding this KOP is populated by agriculture and rural development on the outskirts of Benton City where an increasing amount of suburban development can be seen spreading towards the KOP. This KOP is approximately 14 miles southeast of the siting area and is at the intersection of a major north-south arterial that connects Benton City to the rural residential areas on the outlying edge of the city. This KOP was selected by the Applicant as a potential area of concern for further evaluation even though it is outside of the visual analysis area.

1.6 Visual Simulations and Contrast Rating Analysis

Visual impacts are defined as the change to the existing visual environment resulting from the introduction of modifications to the landscape. An analysis of visual dominance, scale, and contrast was used in determining to what degree the project would attract attention and to assess the relative change in character as compared to the existing landscape and its inherent scenic quality. This analysis was performed using visual simulations and contrast ratings from each KOP. The amount of visual contrast that would be created is directly related to the amount of attention that would be drawn to a feature in the landscape.

1.6.1 Visual Simulations

Photorealistic simulations (simulations), which provide a theoretical view or depiction of the project, were prepared for each KOP. A digital rendering of the project components was superimposed on the KOP baseline photographs to illustrate a simulated representation of how the project may appear based on conditions observed during the documentation of the baseline photography using a 50-mm equivalent focal length. The simulations were used as a tool to aid in evaluating the level of potential visual contrast and associated impacts of the project before and after construction. Because of the constraints of replicating on-the-ground conditions, how an observer may perceive the project in a three-dimensional environment based on visual acuity (ability to recognize small details with precision) as well as perceiving project movement (real world) as compared to a two-dimensional static photo simulation, the photo simulations may not represent all conditions or situations in which the project may be viewed or perceived by viewers. For example, variability in atmospheric, seasonal, and lighting conditions could influence the view. The duration of the view may vary as well; for example, a viewer driving down the highway versus a viewer standing at a scenic overlook on a mountain. The impact analysis is not solely based on photo simulations and only demonstrates a potential viewing condition while taking into consideration how the project may be perceived within the landscape over time and under variable conditions.

Simulations of the project were developed using ArcGIS, Google Earth Pro, Autodesk products (AutoCAD and 3ds Max), and Adobe Photoshop for each KOP. Using these programs, the proposed layout of the solar arrays and transmission lines were modeled, then the images (or “models”) of the layout were superimposed onto the panoramic photographs taken during the field visits. The simulations were developed by superimposing a three-dimensional computer model of the proposed project components on a digital elevation model and then placing that onto the base photographs at the correct scale and distance. Date and time-of-day inputs determine shadows and reflected light, and the software accounts for distance and haze to increase accuracy of viewing conditions at the time the base imagery was taken.

1.6.2 Contrast Rating Analysis

Visual contrast typically results from 1) landform modifications that are necessary to prepare a study area or right-of-way for construction, 2) the removal of vegetation to construct and maintain facilities, and 3) the introduction of new aboveground facilities into the landscape.

The contrast rating analysis method measures potential project-related changes to the existing landscape. The method allows for a level of objectivity and consistency in the process and reduces subjectivity associated with assessing landscape character and scenic quality impacts. Using the BLM’s Visual Resource Contrast Rating system, as outlined in BLM Manual H-8431 (BLM 1986b), the level of contrast between the project and the existing landscape was evaluated from each KOP. This level of contrast determines the degree to which the project would affect the intrinsic visual character and, in turn, the

scenic quality of the landscape. In the context of the project, the form, line, color, and texture associated with the landform, water, vegetation, and existing structures within and adjacent to the project area was recorded. The degree of contrast for each landscape element (e.g., land/water, vegetation, and structures) was then evaluated as none, weak, moderate, or strong (Table 1).

Table 1. Criteria for Degree of Contrast

Degree of Contrast	Criteria
None	The element contrast is not visible or perceived.
Weak	The element contrast can be seen but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, cannot be overlooked, and is dominant in the landscape.

Source: BLM (1986b).

Environmental factors can influence the amount of visual contrast, dominance, and level of attraction introduced by project components. For this analysis, the factors considered and evaluated as part of the determination of the level of contrast from each KOP include visibility conditions, angle of view (relative viewer position and view orientation), duration of view (in time or distance), and scale and spatial relationship (degree of contrast) of the project (BLM 1986a).

Visibility conditions refer to how the project components (i.e., arrays and associated infrastructure) would be viewed in the landscape from KOPs, not whether the proposed project would be seen or not seen from KOPs. These conditions are assessed by looking at the relationship of the project components in the context of the landscape. The first condition is whether the project components would be seen predominantly skylined along the horizon line of a landform or backdropped against a landform. The second condition is whether the views of project components would be predominantly unobstructed or obstructed from the KOP. The third condition is the influence of lighting conditions and the consideration of the intensity of reflection or shadowing (discussed in further detail in Section 2.3, Glare Analysis). The angle of observation from the KOP is also evaluated to determine whether the project components would be seen in the same viewing direction as a dominant visual feature in the landscape.

The duration of view is how long, in time or distance, the project components would be seen from KOPs. For linear KOPs, the duration of view can be calculated in terms of both time and distance by determining the total travel time (typically minutes) along the total distance (miles) of the platform that the project components would be seen.

The last two environmental factors used in this analysis, scale and spatial relationship, evaluate the degree of contrast of the proposed project components in relation to the surrounding landscape when viewed from KOPs. Scale refers to the size of the project components relative to various landscape features. The larger the project components would appear, the less they would repeat the common elements and patterns in the surrounding landscape; that is, the project components would appear to dominate the landscape.

In addition to scale, the arrangement or spatial relationship of landscape features can affect the visual prominence of project components from KOPs. The amount of visual contrast created is directly related to the amount of attention that is drawn to an element in the landscape. For example, if the view from a platform is of a panoramic or expansive landscape, the project components would be less prominent (lower contrast), whereas if the view is of an enclosed or encircled landscape such as a narrow valley, the project components would be more prominent and would appear to dominate the landscape (higher

contrast). For this analysis, contrast is assessed by comparing the project with the major features in the existing landscape.

Changes in the visual setting because of variable atmospheric conditions and seasonal use differences were not evaluated as part of the environmental factors for this project.

2 IMPACT ANALYSIS RESULTS

The construction, operation, and maintenance of the proposed project action would result in effects on visual resources. An analysis of visual dominance, scale, continuity, and contrast was used in determining to what degree the project would attract attention and to assess the relative change in character and scenic quality as compared to the existing characteristic landscape. Table 2 defines the threshold of the levels of visual resources impacts perceived by the casual observer at the viewing platforms, incorporating environmental factors and the existing landscape's scenic quality and landscape character. The magnitude of impact ranges from none to strong.

Table 2. Criteria for Assessing Level of Impacts on Visual Resources

Overall Level of Impact	Change to Landscape Character	Contrast Perceived by Viewers (KOPs)
None	Landscape is unaltered, and project elements would not attract attention. Landscape character is intact with only minor, if any, modifications. Project elements repeat the form, line, color, texture, or scale common in the landscape.	Landscape when viewed is unaltered. Project elements would not be visually evident.
Weak	Landscape would appear intact. Modifications may be present but repeat the form, line, color, texture, and pattern common to the landscape character so completely, and at such scale, that they are not evident. Project elements would introduce the form, line, color, texture, or scale common in the landscape and would be visually subordinate.	Landscape when viewed appears unaltered. Project elements would create weak contrast compared with other features in the landscape when viewed.
Moderate	Landscape would appear to be slightly altered, and project elements would begin to dominate the visual setting. Modifications remain visually subordinate to the landscape character being viewed. Project elements would introduce form, line, color, texture, or scale not common in the landscape and would be visually prominent in the landscape.	Landscape when viewed appears slightly altered. Project elements would be visually subordinate in the landscape and would create moderate contrast compared with other features in the landscape when viewed.

Overall Level of Impact	Change to Landscape Character	Contrast Perceived by Viewers (KOPs)
Strong	Landscape would appear to be heavily altered, and project elements would dominate the visual setting. Modifications strongly dominate the landscape character being viewed. Project elements would be out of scale or contain detail that is out of character with natural landscape as viewed in the foreground or middleground.	Landscape when viewed appears heavily altered. Project elements would introduce elements and/or patterns that are uncommon or not found in the landscape and create disharmony when viewed.

2.1 Proposed Action

2.1.1 Construction

Currently, the exact timing of project construction is not known; however, the Applicant plans for construction to begin around January 2024 after all required project permits for construction are authorized. Project construction is expected to be completed within approximately 1 year. All access during construction would be within the proposed 150-foot temporary construction corridor and would entail driving overland without any added surface material. Construction would adhere to the best management practices as described in the POD document (SWCA2022b). The project has a planned commercial operation date of December 2025.

Geotechnical investigation that would be required before construction would create a temporary weak visual impact due to the equipment and construction like activity needed to extract samples. These geotechnical investigations may entail drilling and borings of structure locations to obtain soil and/or bedrock samples for laboratory analysis. The borings would range from 4 to 8 inches in diameter, and drilling depths would range from 25 to 50 feet below ground surface. Temporary ground disturbance associated with the geotechnical investigation would occur within the requested right-of-way. The temporary disturbance would include the disturbance of vegetation from the transport of the drilling equipment to and from each borehole location. There may be some minor disturbance outside that area in rare cases; however, the maximum temporary disturbance at each boring site is anticipated to be less than 0.4 acre. No more than six borehole locations on DOE-administered land are anticipated.

As proposed, the project would include building or installing PV solar panels, a BESS, internal roads, an O&M building, and transmission lines located within the siting area. During construction, the predominant visual impacts would be dust and vehicular traffic caused by grading, on-site traffic, and numerous construction workers present at the site.

Construction of the project would require the removal of vegetation and landform grading to achieve a level grade to form access ways, roadways, and areas where concrete foundations would be used for inverter equipment, substations, drainage facilities, and other structures. Grading would consist of the excavation and compaction of earth to meet the design requirements. During construction, materials suitable for compaction would be stored in stockpiles at designated locations using proper erosion prevention methods, while unsuitable materials (such as debris and large rocks) would be removed from the site. Project construction would cause a temporary moderate degree of visual impact.

2.1.2 Operation and Maintenance

The KOP descriptions, project visibility, and degree of visual change are presented below in Table 3. This analysis summarizes the overall contrast rating analysis presented in Appendix A and visual simulation information presented in Appendix B.

Visual impacts resulting from project operation and maintenance would vary by KOP with their exposure to project components. There would be strong visual impacts to observers at KOP 6 and 7. The introduction of project components in these areas would leave the landscape appearing heavily modified and altered, with project components dominating the visual setting. There would be moderate visual impacts to observers at KOPs 1, 3, and 4. Introduction of project components in these areas would cause the landscape to appear slightly altered but would remain visually subordinate to the landscape character. There would be weak visual impacts to observers at KOPs 2, 5, and 8. Project components introduced in these areas would be visually subordinate to the existing landscape character. There would be no visual impacts to KOP 9 as this area has a completely obstructed view of the project. Table 3 further details the degree of visual impacts at each individual KOP.

Table 3. Summary of Impacts by Key Observation Point within Analysis Area

KOP Number	Name Location Sensitive Viewers Overall Level of Impact	Summary of Impacts
1	Cold Creek Road/Highway 24 Approximately 13 miles north of the project location surrounded by agricultural fields. Vehicular Travel Route **Moderate**	Level of contrast as viewed from KOP 1 would be moderate (Appendix A). Views of project components from this platform would be partially backdropped against hills and agricultural fields. Visible project components would consist of the transmission line, which will be in close proximity to the roadways represented by the KOP. These roadways provide access to both residential travelers and destination travelers, increasing the number of vehicular viewers. The landscape would appear slightly altered and would begin to dominate the visual setting. Modifications would remain visual subordinate to the landscape as it is viewed. Project elements would introduce form, line, color, texture, and scale not common in the landscape.
2	Highway 241 North-west of project location just north of agricultural fields. Vehicular Travel Route **Weak**	Level of contrast as viewed from KOP 2 would be weak. Views of project components from this platform would be predominantly backdropped against soft grassy fields. Visible project components would consist of transmission lines; the area would retain its existing character with the introduction of these lines because of the existing transmission lines in the area, which help blend these project components into the landscape. The landscape would appear intact with only minor modifications visible, if any. Project elements introduced would have similar form, line, color, texture, or scale common in the landscape, reducing their visibility and assisting in blending project components in the landscape.
3	W Snipes Road/N Wilgus Road South of project, surrounded by agricultural fields and sparse rural development. Residential Area **Weak**	Level of contrast as viewed from KOP 3 would be weak. Views of project components from this platform would be partially screened by topography, agricultural vegetation with rolling horizon lines. Visible project components would consist of solar arrays, but with the degree of topographical variety arrays would be mostly screened. The landscape would appear intact with only minor modifications visible, if any. Project elements introduced would have similar form, line, color, texture, or scale common in the landscape, reducing their visibility and assisting in blending project components in the landscape.
4	W Snipes Road/N Gap Road South of the project area, surrounded by agriculture fields. Vehicular Travel Route **Weak**	Level of contrast as viewed from KOP 4 would be weak. Views of project components from this platform would be backdropped against rolling hills and agricultural fields with screened views due to topography, vegetation, and agriculture. The landscape would appear intact with only minor modifications visible, if any. Project elements introduced would have similar form, line, color, texture, or scale common in the landscape, reducing their visibility and assisting in blending project components in the landscape.

KOP Number	Name Location Sensitive Viewers Overall Level of Impact	Summary of Impacts
5	Interstate 82 Located midway between the city of Prosser and Grandview, surrounded by agricultural fields, north of the Yakima River and south of the project area. Vehicular Travel Route **Weak**	Level of contrast as viewed from KOP 5 would be weak. Views of project components from this platform would be predominantly backdropped against soft mountains that are partially obscured and hills with agricultural fields. Viewable project components would consist of solar arrays and metallic buildings depending on final placement. The landscape would appear intact with only minor modifications visible, if any. Project elements introduced would have similar form, line, color, texture, or scale common in the landscape, reducing their visibility and assisting in blending project components in the landscape.
6	County Line Road South of the project area, north of K & D Machine Shop, surrounded by agricultural land. Vehicular Travel Route **Strong**	Level of contrast as viewed from KOP 6 would be strong. Views of project components from this platform would be predominantly backdropped against mountains. Viewable project components would consist of solar arrays and metallic buildings depending on final placement. The landscape would appear heavily altered and modifications made by project elements would dominate the visual setting of the landscape. Project elements would introduce form, line, color, texture not common to the surroundings and be out of scale and contain detail that is out of character with the natural landscape as viewed in the foreground/middleground area.
7	North Missimer Road Located just north of the project area and west of the Matney Spring and Spring Creek. Vehicle Travel Route **Strong**	Level of contrast as viewed from KOP 7 would be strong. Views of project components would be predominantly backdropped against soft tipped mountains with a low valley. Project components, including the solar array and transmission lines, would be present in the foreground/midground area. The proximity of components and elevated position of the KOP increases the degree of visual impact felt by observers. The landscape would appear heavily altered and modifications made by project elements would dominate the visual setting of the landscape. Project elements would introduce form, line, color, texture not common to the surroundings and would be out of scale and contain detail that is out of character with the natural landscape as viewed in the foreground/middleground area.
8	Transmission Line Located north of the project area. Vehicle Travel Route **Moderate**	Level of contrast as viewed from KOP 8 would be moderate. Views of project components from this platform would be predominantly skylined, sitting on top of hills; however, there is such variation in topography that views are constantly interrupted by topographical changes. The landscape would appear slightly altered and would begin to dominate the visual setting. Modifications would remain visual subordinate to the landscape as it is viewed. Project elements would introduce form, line, color, texture, and scale not common in the landscape.
9	Highway 225/Accord Road This KOP is surrounded by residential areas directly north of Benton City. Residential Areas **None**	There would be no perceived contrast from KOP 9, and project components would not be visible from this KOP because of distance, topography, development, and vegetation. The landscape would appear unaltered and project components would not attract attention. The landscape character would remain intact with only minor, if any, modifications.

2.1.3 Decommissioning

The lifespan of the project is anticipated to be 40 years after completion. It is anticipated that the visual impacts associated with decommissioning would be similar in nature and duration as impacts associated with construction activities until the reclamation process of the siting area is complete.

2.2 No Action Alternative

Under the No Action Alternative, there would be no new disturbances to the landscape character occurring, and no new elements or patterns would be introduced to the project area; therefore, there would be no impact for the casual viewer from the KOPs.

2.3 Glare Analysis

Analysis for the Hop Hill Solar Energy Project used the GlareGauge (also known as Solar Glare Hazard Analysis Tool [SGHAT]) model developed by Forge Solar and the U.S. Department of Energy's Sandia National Laboratories to evaluate potential glare. The analysis focused on potential glare effects on observation points and linear travel routes using multiple observation points (OPs). Aircraft landing and approach were considered; the proposed Hop Hill Solar Energy Project area is 4.5 miles east-northeast of Sunnyside Municipal Airport and more than 8 miles from Prosser Airport. The project is not located on airport property and therefore is not subject to Federal Aviation Administration (FAA) jurisdiction under Federal Aviation Regulations Part 77. The project is located beyond the 2-mile final approach area as defined in the Interim Solar Policy. However, to protect airspace safety, the Applicant has sought to voluntarily apply FAA ocular hazard standards (78 *Federal Register* 63276). These results comply with the FAA standards described in the Interim Solar Policy.

This glare analysis used 12 total OPs; nine OPs that were used were set at existing private residences near the project area and three OPs were placed along Anderson Road, a main east-west travel route. OPs used a height of 6 feet, and route receptors used a height of 4 feet (an average height of passenger cars, trucks, and diesel trucks).

2.3.1 Vehicular Travel Routes

The Hop Hill Solar Energy Project has the possibility to create low-potential afterimage (green ocular impact) glare for the route receptor, Anderson Road (OPs 10, 11, 12), traveling east-west through the proposed project area. The route receptor will have potential for glare up to 10,269 minutes per year; the glare would occur from middle of May to end of July between the hours of 4:00 a.m. and 6:00 a.m. and 6:00 p.m. and 8:00 p.m., resulting in a total of approximately 4 hours per day.

2.3.2 Residential Areas

The glare analysis tool identified that there would be no glare visible at the recreation areas (OPs 1 through 9).

3 RECOMMENDED MITIGATION

To limit the visual impact of the project and project components, the footprint and soil disturbance should be minimized during construction, O&M, and potential decommissioning after the 40-year commercial operation date. Where visual disturbance is inevitable, mitigation measures should be employed.

The primary visual impacts from construction (i.e., dust caused by grading, on-site traffic, and hundreds of construction workers present at the site) can be reduced by using dust abatement measures such as the restriction of vehicle speeds and watering of active areas and roadways.

The transmission lines, battery containers, fencing, and O&M structures should be designed to be the least visually obtrusive by blending in with the existing surrounding landscape. This project's structures would

be viewed against the natural range and agriculture land; therefore, colors, lighting, and surface treatments should reduce contrast with the existing landscape following best management practices (BMPs) identified in the 2013 BMPs for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands (BLM 2013). Colors and finishes should be selected using the BLM Standard Environmental Color Chart and selection instructions. Recommended colors include Covert Green and/or Shadow Gray.

The following are recommended BMPs to reduce visual impacts for project components and activities:

- Locate and operate solar arrays to avoid off-site glare.
- Screen solar arrays to avoid off-site glare.
- Use non-reflective materials, finishes, surface treatments or color-treated solar arrays and support structures.
- Maintain color-treated surfaces of solar arrays.
- Maintain and utilize natural vegetation barriers for mitigation of solar glare where possible.
- Avoid complete removal of vegetation beneath solar arrays.
- Maintain and preserve the existing vegetation within the siting area to the greatest extent possible to reduce overall project impact.
- If additional vegetation is used to enhance mitigation of project components, it should be natural and native to the surrounding area to complement existing vegetation.
- Color treat structures to reduce contrasts with existing landscape.
- Color treat grouped structures using the same color.
- Color treat transmission line poles to reduce contrasts with existing landscape.
- Maintain painted, treated, stained, or coated surfaces properly.
- Direct lights properly to eliminate light spill and trespass.
- Use timers or motion sensors on all building lighting to minimize unnecessary lighting.
- Minimize lighting usage during construction and operations.

After approximately 40 years, if the decision to cease the utilization of project operations is made, the siting area should be restored to a landscape that once again blends into the surrounding valley's forms and textures. The decommissioning of the site would create new visual impacts, including the removal of all aboveground structures, fencing, and debris. This should be accomplished by restoring the site to original contours while minimizing the disturbance of soils. Soils that were disturbed through the removal of the project materials should be stabilized. It is recommended that vegetation that may be used to stabilize the project site post-reclamation, be similar to vegetation types that are present in the project area and surrounding landscape at the time of reclamation.

4 LITERATURE CITED

Bureau of Land Management (BLM). 1984. Manual 8400 – *Visual Resource Management*. April 5. Available at: https://www.blm.gov/policy/manuals. Accessed July, 2022.

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———. 1986b. Manual H-8431 – *Visual Resource Contrast Rating*. Washington, D.C.: U.S. Department of the Interior, BLM, Washington Office. Available at: https://www.blm.gov/policy/handbooks. Accessed February 4, 2019.

———. 2013. *Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands*. First Edition: Cheyenne, Wyoming.

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———. 2022b. Hop Hill Solar Energy Interconnection Project Plan of Development, February 2022.

APPENDIX A

Visual Contrast Rating Forms

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	13N, R23E, S34-35	See report figure.
2. Key Observation Point (KOP) Name: KOP 1 - Cold Creek Rd / HWY 24		
3. VRM Class at Project Location: N/A	(Lat. Long): 46.569537 N, -119.791173 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Undulating, rounded hills; background consists of soft-tipped mountaintops peaking above the smooth, rolling hills.	Patches of grasses and short globular bushes. Geometric patches of agriculture (AG) fields. Globular tree forms.	Repetition of vertical walls of short fencing and tall linear poles. Strong, directional road. Tall, thin t-line.
LINE	Bold horizontal lines with soft undulation. Soft, pointed mountaintops in the background.	Straight, wispy grasses and irregular, globular bushes. Smooth, flowing AG fields. Sparse, irregular, globular trees.	Straight, vertical lines of poles and posts with thin, horizontal connecting lines. Tall, thin vertical t-line. Straight/curving road.
COLOR	Land has a brown hue set against a blue sky with white clouds.	Green trees. Green, yellow-green, and reddish grass. Lush, green AG fields heavily contrast with natural area's colors.	Dark green, white-topped, white or brown posts. T-line metallic shiny silver. Dark to light gray road.
TEX-TURE	Smooth, continuous, and directional.	Fine grasses. Medium/coarse bushes. Smooth, carpet-like AG fields. Fine-textured trees.	Fine, smooth posts. Wooden grain textures. Coarse, gravelly texture on the road.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Repeating tall, thin t-line lines and distinctive horizontal connector arms with thin, horizontal connecting lines.
LINE	No perceived change.	No perceived change.	Repeating tall, thin t-line lines and distinctive horizontal connector arms with thin, horizontal connecting lines.
COLOR	No perceived change.	No perceived change.	Metallic flat-gray or rust-brown transmission line poles.
TEX-TURE	No perceived change.	No perceived change.	Repetitive vertical, smooth t-line.

SECTION D. CONTRAST RATING __SHORT TERM ✓LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓		✓		
	LINE				✓				✓		✓		
	COLOR				✓				✓			✓	
	TEXTURE				✓				✓			✓	

2. Does project design meet visual resource management objectives? ___Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ✓Yes ___No (Explain on reverses side)

Evaluator's Names: Garet Openshaw and Chris Bockey

Date:

(Continued on Page 2)

Comments from item 2.

This KOP is located at the intersection of Cold Creek Road and Highway 24 and is approximately 13.5 miles north of the solar array area and .01 mile east of the proposed Midway Interconnect Transmission line. The topography of this area is characterized by an undulating valley floor with hills bordered by soft-topped mountains. The area is populated by sparse shrubs, grasses surrounded by geometrical agricultural development. In addition, there is a pre-existing transmission line in the distance.

Project components from this KOP would consist of transmission lines running north to south from the Midway Substation to the Project area. Project components are expected to be seen but not dominate the view by casual observers. The area would retain the existing character of the landscape. Based on this contrast rating assessment, project components and activities would create a moderate contrast with the existing landscape character.

Additional Mitigating Measures (See item 3)

Electric transmission poles should be color-treated to reduce contrasts with the existing landscape. Where transmission facilities using monopole towers are located within the same right-of-way or corridor, the color treatment should match the existing facilities within the right-of-way, unless they contrast with the visual backdrop.

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	11N, R24E, S33	See report figure.
2. Key Observation Point (KOP) Name KOP 2- HWY 241		
3. VRM Class at Project Location N/A	(Lat. Long) 46.396890 N, -119.950900 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Wavy, rolling, gentle horizontal lines.	Continuous masses of grasses; continuous horizontal, wavy lines of grass.	Repeating vertical posts. Tall, thin t-lines. Geometric, angular buildings and hay stacks. Strong, directional roadway.
LINE	Distinctive wavy, horizontal lines; soft, pointed mountains in the background.	Short, vertical, straight or wavy lines of grasses.	Repeating vertical posts. Tall, thin t-lines. Geometric, angular, rectangular buildings. Straight/curving roadway.
COLOR	Land has a brown hue set against a blue sky with white clouds.	Dark green, yellow-green, and reddish brown grasses.	Brown or green with white tip posts. Metallic, silvery t-lines. Metallic, silvery blue/brown buildings. Tan hay.
TEX-TURE	Smooth, continuous, and directional.	Smooth, fine, continuous horizontal carpet-like texture of grasses.	Fine textures. Wooden, grainy textured posts. Smooth, flowing buildings. Coarse, gravelly roadway.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Repeating tall, thin t-line lines.
LINE	No perceived change.	No perceived change.	Repeating tall, t-line with thin, horizontal connecting lines.
COLOR	No perceived change.	No perceived change.	Metallic flat-gray or rust-brown transmission line poles.
TEX-TURE	No perceived change.	No perceived change.	Repetitive vertical, metallic, smooth t-line.

SECTION D. CONTRAST RATING __SHORT TERM ✓LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓			✓	
	LINE				✓				✓			✓	
	COLOR				✓				✓			✓	
	TEXTURE				✓				✓			✓	

2. Does project design meet visual resource management objectives? ___Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
✓Yes ___No (Explain on reverses side)

Evaluator's Names — Date
Garet Openshaw and Chris Bockey

(Continued on Page 2)

Comments from item 2.

This KOP is located at Highway 241 and is approximately 0.35 mile southwest of the solar array area and 4 miles south of the proposed Midway/Wautoma Interconnect Transmission lines. The topography of this area is characterized by flat to undulating valley floor with hills bordered by soft-topped mountains. The area is populated primarily by grasses and geometrical agricultural development. In addition, there is a pre-existing transmission line in the distance.

Project components from this KOP would consist of transmission lines running north to south from the Midway and Wautoma Substations to the Project area. Project components are expected to be distantly seen but only after intense, close observation and would not be seen by the casual observer. The area would retain the existing character of the landscape, and because of the existing transmission lines, new transmission lines would not stand out in the landscape. Based on this contrast rating assessment, project components and activities would create a weak contrast with the existing landscape character.

Additional Mitigating Measures (See item 3)

Materials and surface treatments for structures should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop. Unless safety or functional requirements preclude it, all structures should be color-treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be non-reflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission poles should be color-treated to reduce contrasts with the existing landscape. Where transmission facilities using monopole towers are located within the same right-of-way or corridor, the color treatment should match the existing facilities within the right-of-way, unless they contrast with the visual backdrop.

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	10N, R24E, S32	See report figure.
2. Key Observation Point (KOP) Name: KOP 3 - W Snipes Rd/N Wilgus Rd		
3. VRM Class at Project Location: N/A	(Lat. Long): 46.302542 N, -119.831475 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Low-lying area with undulating topography. Slight wave to the horizon line.	Sparse patches of grass. Regular, organized agriculture (AG) plants. Singular patch of globular trees.	Continual, repetitive walls of vertical posts. Strong directional roadway. Geometric, angular buildings.
LINE	Wavy, horizontal, continuous line.	Continual, organized rows of AG plants, vertical lines, irregular shapes. Several large conical and globular trees.	Repeating vertical fence posts and electrical poles. Linear roadway. Geometric, angular buildings.
COLOR	Land has a tan/brown hue set against a blue sky with white clouds.	Various shades of green vegetation.	Light green-brown or brown posts. Brown electrical poles. Metallic gray-blue buildings. Gray roadway.
TEX-TURE	Smooth and continuous.	Coarse transitioning into a smoother continuous texture; blending shades give cloud-like appearance.	Wooden, grainy posts. Smooth, metallic posts. Smooth, glossy building textures. Coarse, gravelly road.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived changes.	No perceived changes.	Geometric, angular arrays.
LINE	No perceived changes.	No perceived changes.	Geometric, angular arrays.
COLOR	No perceived changes.	No perceived changes.	Gray-blue arrays with metallic framing.
TEX-TURE	No perceived changes.	No perceived changes.	Angular, smooth, glossy arrays.

SECTION D. CONTRAST RATING __SHORT TERM ✓LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓			✓	
	LINE				✓				✓			✓	
	COLOR				✓				✓			✓	
	TEXTURE				✓				✓			✓	

2. Does project design meet visual resource management objectives? ___Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ✓Yes ___No (Explain on reverses side)

Evaluator's Names: Garet Openshaw and Chris Bockey

Date

(Continued on Page 2)

Comments from item 2.

This KOP is located at the intersection of West Snipes Road and North Wilgus Road and is approximately .77 mile southwest of the solar array area and 4.5 miles southwest of the proposed Midway/Wautoma Interconnect Transmission lines. The topography of this area is characterized by flat to undulating valley floor with hills and fields covered with agriculture (vineyards) as well as some rural residential development. Additionally, there are a number of vertical elements in the area related to agriculture as well as an existing transmission line in the foreground of this KOP.

Project components from this KOP would consist of mostly screened views (due to topography and AG vegetation and support elements) of the solar arrays (depending on final location of solar array placement). Project components are expected to be distantly seen but would not attract the attention of the casual observer. The area would retain the existing character of the landscape. Based on this contrast rating assessment project, components and activities would create a weak contrast with the existing landscape character.

Additional Mitigating Measures (See item 3)

Materials and surface treatments for structures should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop. Unless safety or functional requirements preclude it, all structures should be color-treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be nonreflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission poles should be color-treated to reduce contrasts with the existing landscape. Where transmission facilities using monopole towers are located within the same right-of-way or corridor, the color treatment should match the existing facilities within the right-of-way, unless they contrast with the visual backdrop.

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	9N, R24E, S3	See report figure.
2. Key Observation Point (KOP) Name: KOP 4 - W Snipes Rd/N Gap Rd		
3. VRM Class at Project Location: N/A	(Lat. Long): 46.302206 N, -119.790839 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Undulating rounded, rolling hills.	Sparse patches of grasses. Sporadic, masses of globular trees. Regular rows of organized agricultural (AG) crops.	Repeating, vertical posts. Repeating, tall electrical poles. Strong, directional roadway.
LINE	Wavy but defined horizon line.	Straight, thick grasses. Irregular, globular trees. Repeating, organized AG rows. Transitional edge between road and AG.	Vertical posts, thin horizontal connecting lines. Tall, electrical poles. Straight to curving directional roadway.
COLOR	Land has a dark to light brown hue set against a blue sky with white clouds.	Various shades of green and yellow-green trees. Reddish brown grasses in the background.	Vertical elements are dark to light brown (wood/metal). Roadway is gray.
TEX-TURE	Relatively smooth, continuous texture.	Fine-textured vegetation overall. Trees have a medium coarse texture due to distance and reflectivity.	Fine textures. Coarser wood, grainy texture on posts. Coarse, gravel roadway.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived changes.	No perceived changes.	Geometric, angular arrays.
LINE	No perceived changes.	No perceived changes.	Geometric, angular arrays.
COLOR	No perceived changes.	No perceived changes.	Gray-blue arrays with metallic framing.
TEX-TURE	No perceived changes.	No perceived changes.	Angular, smooth, glossy arrays.

SECTION D. CONTRAST RATING __SHORT TERM ✓LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓			✓	
	LINE				✓				✓			✓	
	COLOR				✓				✓			✓	
	TEXTURE				✓				✓			✓	

2. Does project design meet visual resource management objectives? ___Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ✓Yes ___No (Explain on reverses side)

Evaluator's Names: Garet Openshaw and Chris Bockey

Date

(Continued on Page 2)

Comments from item 2.

This KOP is located at the intersection of West Snipes Road and North Gap Road and is approximately .77 mile southwest of the solar array area and 4.5 miles southwest of the proposed Midway/Wautoma Interconnect Transmission lines. The topography of this area is characterized by undulating valley floor with hills and agricultural fields. Additionally, there are a number of vertical elements in the area related to agriculture as well as an existing transmission line in the foreground of this KOP.

Project components from this KOP would consist of screened views (due to topography, vegetation, and agriculture) of the solar arrays fields. Project components are expected to be seen in the distance but not dominate the view of the casual observer. Based on this contrast rating assessment, project components and activities would create a weak contrast with the existing landscape character.

Additional Mitigating Measures (See item 3)

Materials and surface treatments for structures should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project s backdrop. Unless safety or functional requirements preclude it, all structures should be color-treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be nonreflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission poles should be color-treated to reduce contrasts with the existing landscape. Where transmission facilities using monopole towers are located within the same right-of-way or corridor, the color treatment should match the existing facilities within the right-of-way, unless they contrast with the visual backdrop.

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	9N, R24E, S28	See report figure.
2. Key Observation Point (KOP) Name: KOP 5 - Interstate 82 (I-82)		
3. VRM Class at Project Location: N/A	(Lat. Long): 46.239218 N, -119.821369 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Continuous, horizontal lines with gentle slopes. Soft-pointed mountains in the background.	Masses of globular bushes. Tall, columnar/globular trees. Regular, organized rows of agriculture (AG).	Geometric, angular buildings. Irregular, angular masses of machinery. Vertical poles and posts. Linear, directional road.
LINE	Continuous, wavey horizontal lines. Slightly pointed mountains in the background.	Round, globular bushes of various sizes. Irregular, globular trees or straight, vertical, columnar trees.	Straight and angular buildings. Repeating tall vertical electrical poles, short vertical fence posts. Straight road.
COLOR	Land has a dark to light brown hue set against a dark to light blue sky with fluffy white clouds.	Various shades of green, yellow-green, and olive green.	Wide variety of building and machinery colors. Brown electrical poles and fence posts. Light tan-brown dirt road.
TEX-TURE	Smooth, continuous, and softly rolling texture.	Overall vegetation has a fine texture. Trees have a medium coarseness due to distance.	Smooth buildings. Coarse, grainy wood texture on posts/poles. Smooth metal fence posts. Smooth machine textures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Geometric, angular arrays. Geometric, angular building and storage.
LINE	No perceived change.	No perceived change.	Geometric, angular arrays and buildings.
COLOR	No perceived change.	No perceived change.	Gray-blue arrays with metallic framing. Metallic material buildings.
TEX-TURE	No perceived change.	No perceived change.	Angular, smooth, glossy arrays. Smooth, metallic buildings.

SECTION D. CONTRAST RATING __SHORT TERM ✓LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1) STRONG	MODERATE	WEAK	NONE	VEGETATION (2) STRONG	MODERATE	WEAK	NONE	STRUCTURES (3) STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓			✓	
	LINE				✓				✓			✓	
	COLOR				✓				✓			✓	
	TEXTURE				✓				✓			✓	

2. Does project design meet visual resource management objectives? ___Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ✓Yes ___No (Explain on reverses side)

Evaluator's Names: Garet Openshaw and Chris Bockey

Date

(Continued on Page 2)

Comments from item 2.

This KOP is located on Interstate 82 approximately 4.8 miles south of the identified solar array area and 8.5 miles south of the proposed Midway/Wautoma Interconnect Transmission lines. The topography of this area is mostly flat and gently sloping valley floor with soft-topped mountains in the background. The landscape is covered in geometrical-shaped agricultural development (vineyards) and ornamental trees. The development of the area is characterized as sparse rural and agricultural development. This area has an excess amount of vehicles and campers cluttering up the visual quality of the landscape. Additionally, there are a number of transmission lines and a communication tower.

Visible project components from this KOP would consist of screened views of solar array fields in the project area. There may be some visibility of structures depending on final site placement. Project components are expected to be seen but not attract the attention of the casual observer. The area would retain the existing character of the landscape. Based on this contrast rating assessment, project components and activities would create a weak contrast with the existing landscape character.

Additional Mitigating Measures (See item 3)

Materials and surface treatments for structures should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop. Unless safety or functional requirements preclude it, all structures should be color-treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be nonreflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission poles should be color-treated to reduce contrasts with the existing landscape. Where transmission facilities using monopole towers are located within the same right-of-way or corridor, the color treatment should match the existing facilities within the right-of-way, unless they contrast with the visual backdrop.

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	10N, R23E, S25	See report figure.
2. Key Observation Point (KOP) Name KOP 6- Country Line Rd		
3. VRM Class at Project Location N/A	(Lat. Long) 46.324136 N, -119.873624 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Smooth, continuous, slightly hilly. Central flat area. Soft-tipped mountaintops in the background.	Linear regular rows of agricultural (AG) fields. Two pockets of tall, globular trees. Continuous fields of dense grasses.	Repeating tall, thin t-line. Repeating vertical posts and electrical poles. Geometric buildings/vehicles. Linear road.
LINE	Smooth, continuous wavy lines. Soft-tipped, slightly angular mountains. Slight overall concave land form.	Repeating, vertical lines of AG plants. Tall, globular trees. Dense, continuous fields of short, lined grasses.	Repeating short and tall vertical lines; thin, horizontal connecting lines. Angular buildings and trailers. Straight, linear road.
COLOR	Land has a brown hue set against a mostly white, cloudy sky with some blue patches.	Green/yellow-green grasses. Reddish brown grasses in the distance. Dark green trees. Green AG plants.	Metallic t-line. Brown posts and poles. Gray-brown roadway. Tan and white buildings with gray roofs.
TEX-TURE	Smooth, soft, flowing, continuous textures.	Wispy, continuous carpet-like grasses. Medium coarse AG plants. Medium coarse trees	Smooth, metallic t-lines. Wood, grainy coarse posts and poles. Smooth buildings.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Geometric, angular arrays. Geometric, angular building and storage.
LINE	No perceived change.	No perceived change.	Geometric, angular arrays, and buildings.
COLOR	No perceived change.	No perceived change.	Gray-blue arrays with metallic framing. Metallic material buildings.
TEX-TURE	No perceived change.	No perceived change.	Angular, smooth, glossy arrays. Smooth, metallic buildings.

SECTION D. CONTRAST RATING __SHORT TERM ✓LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓		✓		
	LINE				✓				✓	✓			
	COLOR				✓				✓	✓			
	TEXTURE				✓				✓	✓			

2. Does project design meet visual resource management objectives? ___Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
✓Yes ___No (Explain on reverses side)

Evaluator's Names: Garet Openshaw and Chris Bockey
Date: 08/05/2022

(Continued on Page 2)

Comments from item 2.

This KOP is located on County Line Road approximately 0.8 mile south of the identified solar array area and approximately 4.72 miles south of the proposed Midway/Wautoma Interconnect Transmission lines. The topography of this area is gently sloping and undulating valley areas and is bordered by mountains. Vegetation is mostly natural rangeland and fenced-off agricultural land with some pinions in the mountains. Development in this area is sparse, including some rural residential development along the roadway. Additionally, there are two pre-existing transmission lines, one of which runs parallel to the road.

The elevated position of this KOP provides an expansive view of the surrounding areas, especially the area where the proposed project would be. Visible project components from this KOP would consist of solar array fields in the project area. There may be some visibility of structures depending on final site placement. Project components are expected to be seen and attract attention but not dominate the view of casual observers. Based on this contrast rating assessment, project components and activities would create a strong contrast with the existing landscape character.

Additional Mitigating Measures (See item 3)

Materials and surface treatments for structures should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop. Unless safety or functional requirements preclude it, all structures should be color-treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be nonreflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission poles should be color-treated to reduce contrasts with the existing landscape. Where transmission facilities using monopole towers are located within the same right-of-way or corridor, the color treatment should match the existing facilities within the right-of-way, unless they contrast with the visual backdrop.

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	10N, R24E, S02	See report figure.
2. Key Observation Point (KOP) Name: KOP 7 - N Missimer Rd		
3. VRM Class at Project Location: N/A	(Lat. Long): 46.377201 N, -119.7879669 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Bold, horizontal, flat to undulating hills, with soft-pointed mountaintops in the distance. One large mountain.	Soft patches of long, linear grasses. Dense to sparse patches of irregular, globular sagebrush.	Gentle, curving roadway lines. Faint geometric, angular buildings in the distance.
LINE	Wavy, horizontal lines with soft undulation of hills and mountain lines with soft mountain points.	Transitional vegetation edges and patches in the distance. Irregular, globular sagebrush.	Gentle, curving, parallel roadway. Distant geometric, horizontal, and vertical angular lines of buildings.
COLOR	Land has a brown to tan hue. White topped mountain set against a light blue background with thin, wispy, white clouds.	Silvery-green sage brush bushes. Green with tinge of red and yellow grasses.	Dark gray-brown roadway. Bright and light colored buildings stand out in the distance against dark natural colors.
TEX-TURE	Smooth, soft, continuous textures.	Fine, wispy, carpet-like texture of grasses. Coarse to fine textures of bushes.	Roadway has a coarse, gravelly texture. Distant buildings have a smooth, sporadic texture.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Geometric, angular arrays. Geometric, angular building and storage. Repeating tall, thin t-line lines.
LINE	No perceived change.	No perceived change.	Geometric, angular arrays and buildings. Repeating tall, t-line with thin, horizontal connecting lines.
COLOR	No perceived change.	No perceived change.	Gray-blue arrays with metallic framing. Metallic material buildings. Muted silver-gray substation and metallic t-line.
TEX-TURE	No perceived change.	No perceived change.	Angular, smooth, glossy arrays. Smooth, metallic buildings. Repetitive vertical metallic, smooth t-line.

SECTION D. CONTRAST RATING ___SHORT TERM ✓LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓	✓			
	LINE				✓				✓	✓			
	COLOR				✓				✓	✓			
	TEXTURE				✓				✓	✓			

2. Does project design meet visual resource management objectives? ___Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ✓Yes ___No (Explain on reverses side)

Evaluator's Names: Garet Openshaw and Chris Bockey
Date: 08/05/2022

(Continued on Page 2)

Comments from item 2.

This KOP is located on North Missimer Road approximately 0.5 mile north of the identified solar array area and approximately 0.2 mile east of the proposed Midway/Wautoma Interconnect Transmission lines. The KOP is elevated over the surrounding area; the surrounding topography consists of flat valleys and tall bordering mountains. Vegetation in the area consists of shrubs interspersed with grasses. The elevated position and low valley allows for extensive views of the rural and agricultural development; the amount of ornamental trees and agricultural plants create a strong color contrast with the natural rangeland.

Visible project components from this KOP would consist of elevated views of solar array fields and the electrical transmission line running to the Midway and Wautoma Substations. Project components are expected to be seen and attract attention but not dominate the view of casual observers. Based on this contrast rating assessment, project components and activities would create a moderate contrast with the existing landscape character.

Additional Mitigating Measures (See item 3)

Materials and surface treatments for structures should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop. Unless safety or functional requirements preclude it, all structures should be color-treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be nonreflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission poles should be color treated to reduce contrasts with the existing landscape. Where transmission facilities using monopole towers are located within the same right-of-way or corridor, the color treatment should match the existing facilities within the right-of-way, unless they contrast with the visual backdrop.

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	11N, R24E, S22	See report figure.
2. Key Observation Point (KOP) Name: KOP 8 - Transmission Line		
3. VRM Class at Project Location: N/A	(Lat. Long): 46.4205458 N, -119.7879669 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Undulating, rounded hills form the horizon line.	Straight to wavy clumps of grasses. Scattered, sparse small globular bushes.	No visible structures.
LINE	Wavy, rolling, horizontal lines, soft points.	Straight to wavy linear grasses. Irregular, globular bushes.	No visible structures.
COLOR	Land has a brown hue set against a dark to light blue sky with thin, white clouds.	Yellow-green to reddish brown grasses. Green bushes.Yellow agriculture field in the distance.	No visible structures.
TEX-TURE	Smooth, continuous, rolling ground.	Fine, dense, carpet-like texture.	No visible structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	Repeating form of tall, thin transmission lines with distinctive horizontal connector arms.
LINE	No perceived change.	No perceived change.	Tall, thin transmission lines with distinctive horizontal connector arms and thin, horizontal connecting lines.
COLOR	No perceived change.	No perceived change.	Metallic flat-gray and rust-brown t-line.
TEX-TURE	No perceived change.	No perceived change.	Repetitive vertical, metallic, smooth t-line.

SECTION D. CONTRAST RATING __SHORT TERM ✓LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1) STRONG	MODERATE	WEAK	NONE	VEGETATION (2) STRONG	MODERATE	WEAK	NONE	STRUCTURES (3) STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓		✓		
	LINE				✓				✓		✓		
	COLOR				✓				✓		✓		
	TEXTURE				✓				✓		✓		

2. Does project design meet visual resource management objectives? ___Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ✓Yes ___No (Explain on reverses side)

Evaluator's Names: Garet Openshaw and Chris Bockey

Date

(Continued on Page 2)

Comments from item 2.

This KOP is located approximately 4 miles north of the identified solar and approximately 0.05 mile east of the Midway/Wautoma Transmission line. The topography of this area is gently sloping and undulating hills with mainly grassy vegetations and some sparse shrubs interspersed. There is minimal development in this area, including some fence lines that line the agricultural lands in the area.

Visible project components from this KOP would consist of views of the Midway/Wautoma Transmission lines. Project components are expected to be seen and not attract attention of the casual viewer or dominate their view. Based on this contrast rating assessment, project components and activities would create a weak contrast with the existing landscape character.

Additional Mitigating Measures (See item 3)

Electric transmission poles should be color-treated to reduce contrasts with the existing landscape. Where transmission facilities using monopole towers are located within the same right-of-way or corridor, the color treatment should match the existing facilities within the right-of-way, unless they contrast with the visual backdrop.

Form 8400-4
(June 2018)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 06/08/2022
District Office: N/A
Field Office: N/A
Land Use Planning Area: N/A

SECTION A. PROJECT INFORMATION

1. Project Name	4. KOP Location (T.R.S)	5. Location Sketch
Hop Hill Solar Energy Project	10N, R24E, S36	See report figure.
2. Key Observation Point (KOP) Name: KOP 9 - HWY 225/Accord Road		
3. VRM Class at Project Location: N/A	(Lat. Long): 46.301390 N, -119.493679 W	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat foreground and midground; undulating hills in the background; soft point mountaintops.	Masses of grasses. Globular, conical, columnar tree forms.	Geometric, angular buildings. Tall, distinctive T-shaped electrical poles with thin, horizontal connecting lines.
LINE	Wavy, horizontal horizon line; soft point mountaintops.	Straight and wavy vertical grasses. Irregular, globular trees.	Geometric, angular, vertical and horizontal building lines. Linear, vertical electrical lines.
COLOR	Land has a brown hue set against a dark to light blue sky with a few wispy white clouds.	Dark to light green, yellow and reddish brown grasses, bushes, and trees.	Buildings are various colors. Electrical poles are brown.
TEX-TURE	Soft, continuous, and rolling.	Fine-textured grasses; medium coarseness in trees.	Buildings have smooth finishes.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change.	No perceived change.	No perceived change.
LINE	No perceived change.	No perceived change.	No perceived change.
COLOR	No perceived change.	No perceived change.	No perceived change.
TEX-TURE	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING __SHORT TERM __LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1) STRONG	MODERATE	WEAK	NONE	VEGETATION (2) STRONG	MODERATE	WEAK	NONE	STRUCTURES (3) STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				✓				✓				✓
	LINE				✓				✓				✓
	COLOR				✓				✓				✓
	TEXTURE				✓				✓				✓

2. Does project design meet visual resource management objectives? ___Yes ___No (Explain on reverses side)

3. Additional mitigating measures recommended ___Yes ✓No (Explain on reverses side)

Evaluator's Names: Garet Openshaw and Chris Bockey

Date

(Continued on Page 2)

Comments from item 2.

This KOP is located on the intersection of Highway 225 and West Accord Road, which is approximately 13.5 miles east of the identified solar array area and approximately 14.7 miles southeast of the Midway/Wautoma Transmission line. The topography of this area is a mostly flat valley with some undulating hills in the background. The vegetation in this area is mostly grasses and ornamental trees. This KOP is surrounded by growing residential development.

At this KOP, there would be no view of the project area due to topography, vegetation, and residential development. Based on this contrast rating assessment, project components and activities would create no contrast with existing landscape character.

Additional Mitigating Measures (See item 3)

APPENDIX B

KOP Visual Simulations

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-16-22**

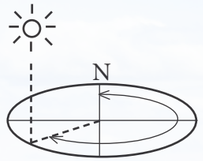
Photo Time: **2:46 PM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **227.54°**



Sun Angle: **55°**

Lighting Angle on Project: **Side Lit**

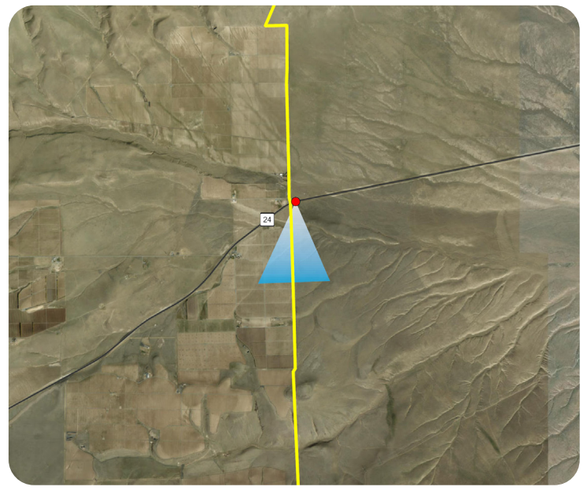
Wind: **8 mph**

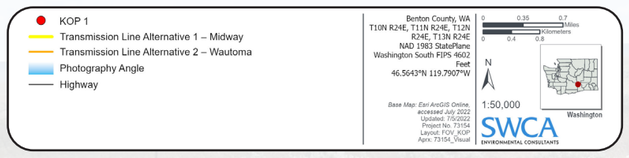
Cloud Cover: **55%**

Temperature (°F): **71°F**

Transmission Structure Paint Finish Approximated in Simulation Process: **Galvanized Steel**

Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.





Approximate Distance to Solar Field Corridor: **0.14 miles**

Project Location

Height to Tip of Structures: **100 feet**

Front Elevation — Side Elevation

Structure Diagram

KOP 1 - Washington State Route 24

Base Photographic Documentation

Latitude (°): **46.3410**

Longitude (°): **-119.4728**

Viewpoint Elevation (feet): **957**

Camera Height (meters): **1.5**

Camera Heading (degrees): **UPDATE**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 1: View from Washington State Route 24 and Cold Creek Road looking south - Existing Condition

KOP 1: View from Washington State Route 24 and Cold Creek Road looking south - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-16-22**

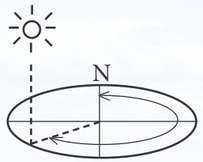
Photo Time: **2:46 PM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth:



227.54°

Sun Angle: **55°**

Lighting Angle on Project: **Side Lit**

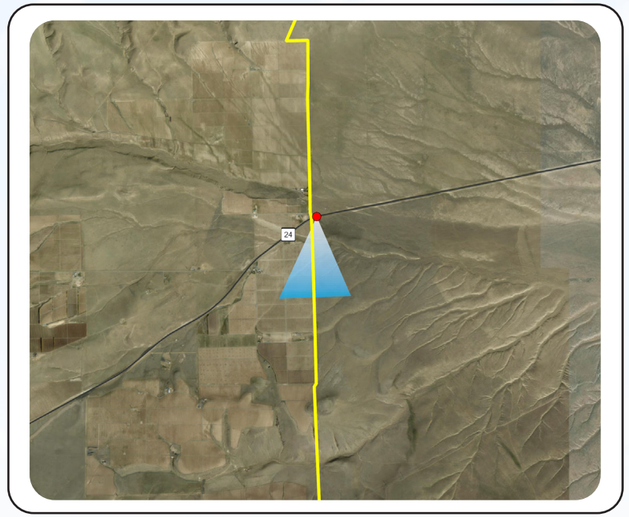
Wind: **8 mph**

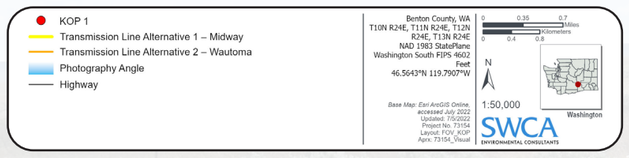
Cloud Cover: **55%**

Temperature (°F): **71°F**

Transmission Structure Paint Finish Approximated in Simulation Process:
Self Weathering Steel

Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.

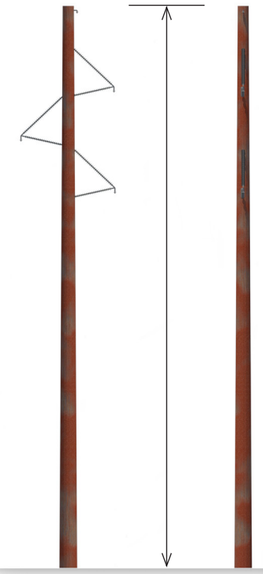




Approximate Distance to Solar Field Corridor: **0.14 miles**

Project Location

Height to Tip of Structures: **100 feet**



Front Elevation — Side Elevation

Structure Diagram

KOP 1 - Washington State Route 24

Base Photographic Documentation

Latitude (°): **46.3410**

Longitude (°): **-119.4728**

Viewpoint Elevation (feet): **957**

Camera Height (meters): **1.5**

Camera Heading (degrees): **UPDATE**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 1: View from Washington State Route 24 and Cold Creek Road looking south - Existing Condition

KOP 1: View from Washington State Route 24 and Cold Creek Road looking south - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-16-22**

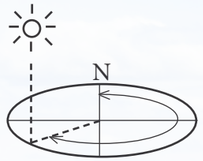
Photo Time: **2:46 PM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **227.54°**



Sun Angle: **55°**

Lighting Angle on Project: **Side Lit**

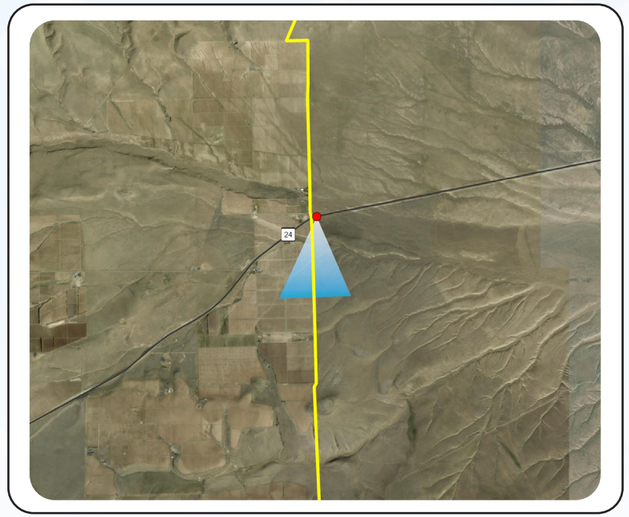
Wind: **8 mph**

Cloud Cover: **55%**

Temperature (°F): **71°F**

Transmission Structure Paint Finish Approximated in Simulation Process: **Wood**

Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.



KOP 1
Transmission Line Alternative 1 – Midway
Transmission Line Alternative 2 – Wautoma
Photography Angle
Highway

Benton County, WA
T10N R24E, T11N R24E, T12N R24E, T13N R24E
NAD 1983 StatePlane Washington South FIPS 4602 Feet
46.5643°N 119.7907°W

Base Map: Esri ArcGIS Online, accessed July 2022
Updated: 7/5/2022
Project No. 73154
Layout: FOV_KOP Aprx. 73154_Visual

0 0.35 0.7 Miles
0 0.4 0.8 Kilometers
N
1:50,000
Washington
SWCA ENVIRONMENTAL CONSULTANTS

Approximate Distance to Solar Field Corridor: **0.14 miles**

Project Location

Height to Tip of Structures: **100 feet**

Front Elevation — Side Elevation

Structure Diagram

KOP 1 - Washington State Route 24

Base Photographic Documentation

Latitude (°): **46.3410**

Longitude (°): **-119.4728**

Viewpoint Elevation (feet): **957**

Camera Height (meters): **1.5**

Camera Heading (degrees): **UPDATE**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 1: View from Washington State Route 24 and Cold Creek Road looking south - Existing Condition

KOP 1: View from Washington State Route 24 and Cold Creek Road looking south - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-16-22**

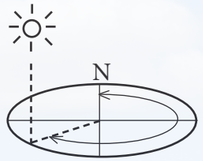
Photo Time: **3:22 PM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth:



239.20°

Sun Angle: **49.9°**

Lighting Angle on Project: **Side Lit**

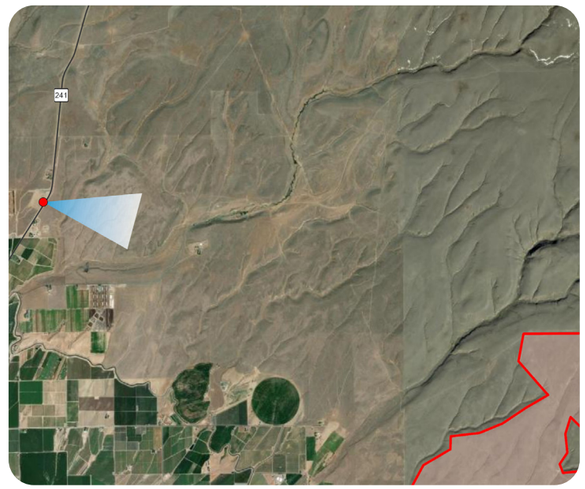
Wind: **8 mph**

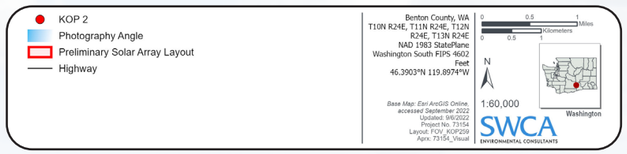
Cloud Cover: **55%**

Temperature (°F): **71°F**

Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.

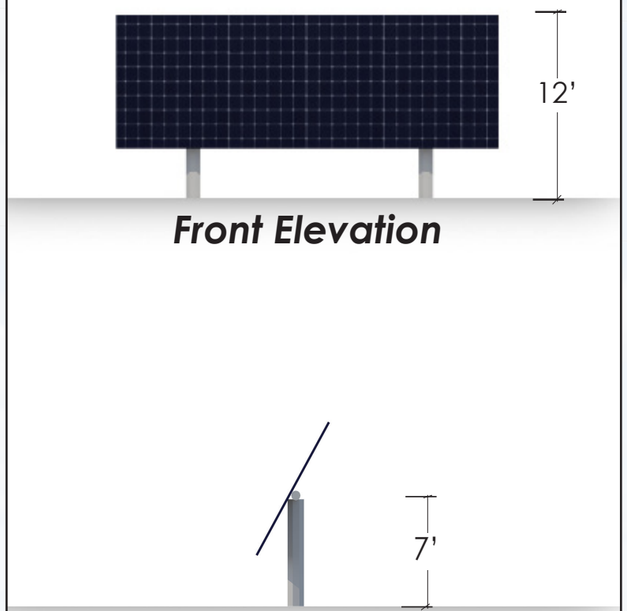
.





Approximate Distance to Solar Field Corridor: **4.06 miles**

Project Location



Structure Diagram

KOP 2 - Washington State Route 241

Base Photographic Documentation

Latitude (°): **46.2349**

Longitude (°): **-119.5732**

Viewpoint Elevation (feet): **1417**

Camera Height (meters): **1.5**

Camera Heading (degrees): **112.77**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA®
ENVIRONMENTAL CONSULTANTS

KOP 2: View from Washington State Route 241 looking southeast - Existing Condition

KOP 2: View from Washington State Route 241 looking southeast - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-16-22**

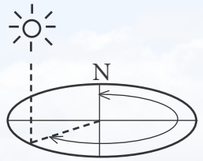
Photo Time: **3:49 PM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **246.20°**



Sun Angle: **45.93°**

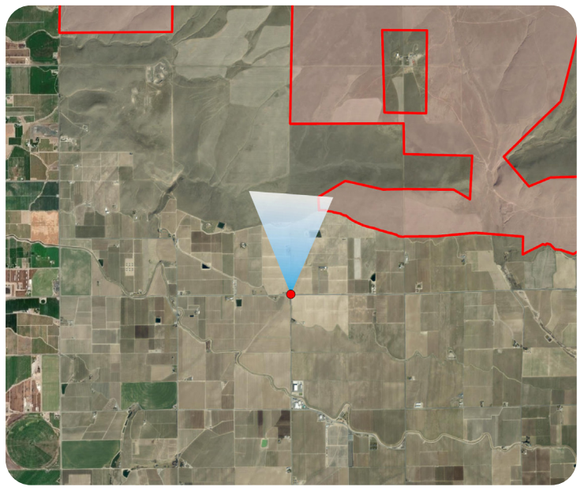
Lighting Angle on Project: **Side Lit**

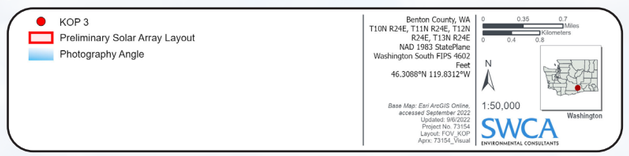
Wind: **8 mph**

Cloud Cover: **55%**

Temperature (°F): **71°F**

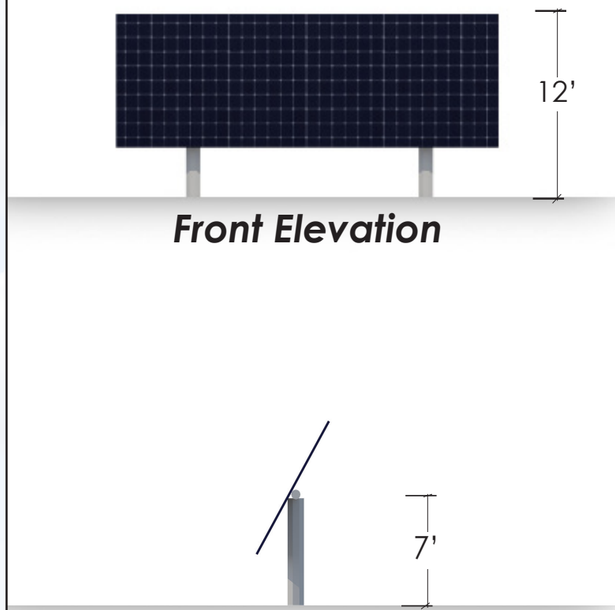
Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.





Approximate Distance to Solar Field Corridor: **3.04 miles**

Project Location



Front Elevation

Side Elevation

Structure Diagram

KOP 3 - West Snipes Road/North Wilgus Road

Base Photographic Documentation

Latitude (°): **46.1891**

Longitude (°): **-119.4953**

Viewpoint Elevation (feet): **1215**

Camera Height (meters): **1.5**

Camera Heading (degrees): **0.89**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 3: View from West Snipes Road and North Wilgus Road looking north - Existing Condition

KOP 3: View from West Snipes Road and North Wilgus Road looking north - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-16-22**

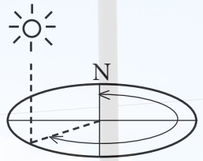
Photo Time: **4:03 PM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **249.55°**



Sun Angle: **43.71°**

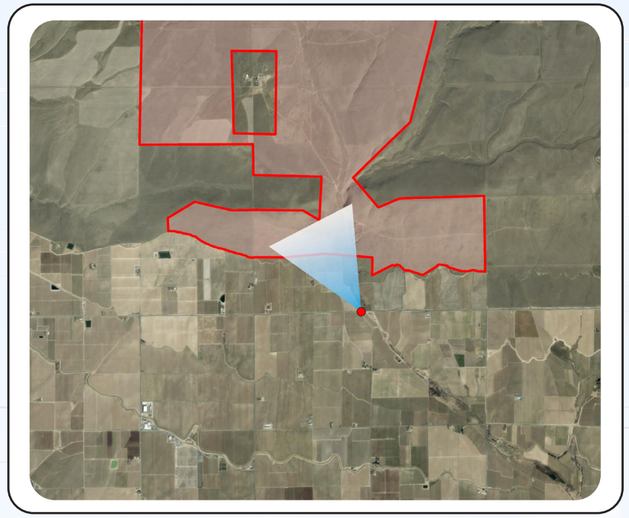
Lighting Angle on Project: **Side Lit**

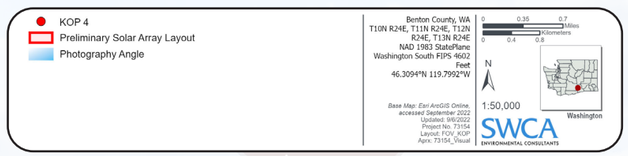
Wind: **8 mph**

Cloud Cover: **55%**

Temperature (°F): **71°F**

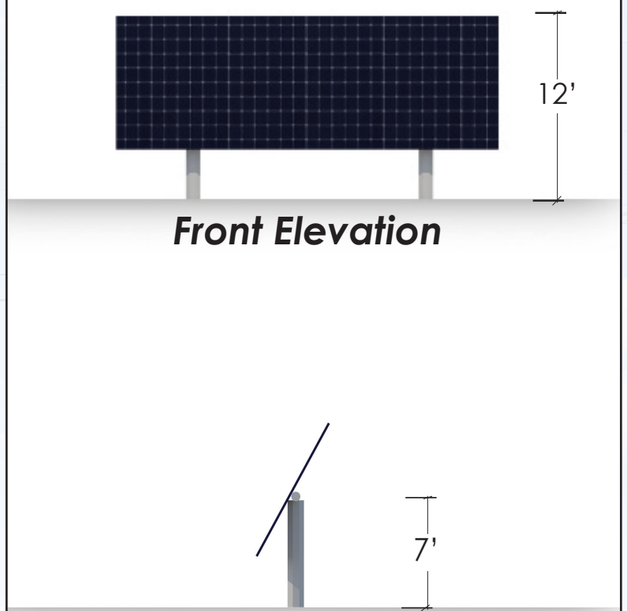
Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.





Approximate Distance to Solar Field Corridor: **3.62 miles**

Project Location



Structure Diagram

KOP 4 - West Snipes Road/North Gap Road

Base Photographic Documentation

Latitude (°): **46.1879**

Longitude (°): **-119.4727**

Viewpoint Elevation (feet): **1226**

Camera Height (meters): **1.5**

Camera Heading (degrees): **327.76**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 4: View from West Snipes Road and North Gap Road looking northwest - Existing Condition

KOP 4: View from West Snipes Road and North Gap Roadlooking northwest - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-16-22**

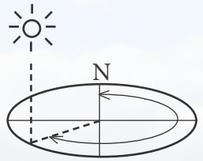
Photo Time: **5:20 PM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **266.03°**



Sun Angle: **30.64°**

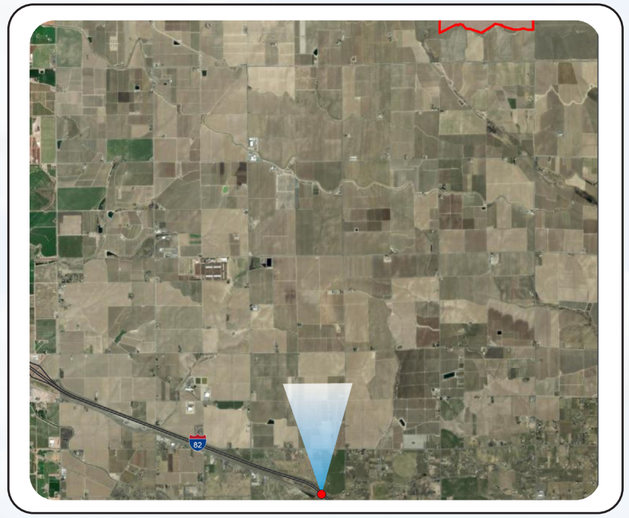
Lighting Angle on Project: **Side Lit**

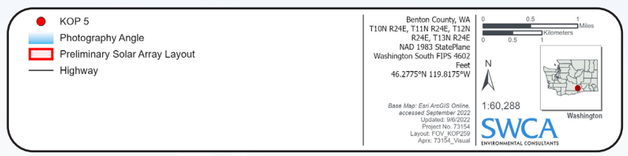
Wind: **8 mph**

Cloud Cover: **55%**

Temperature (°F): **69°F**

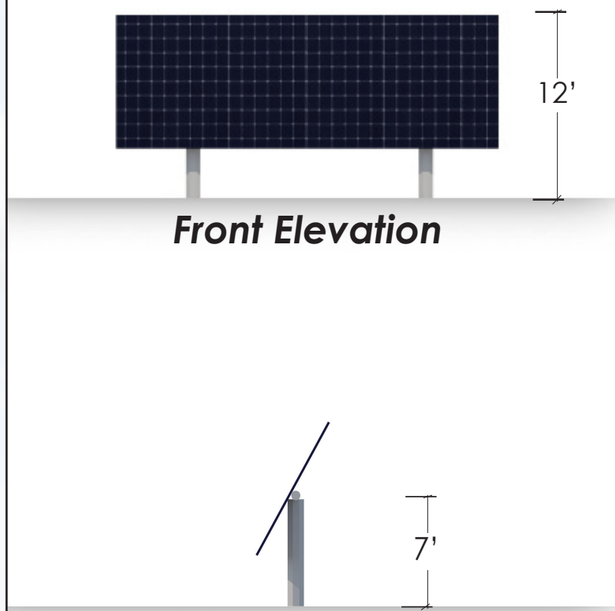
Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.





Approximate Distance to Solar Field Corridor: **7.44 miles**

Project Location



Front Elevation

Side Elevation

Structure Diagram

KOP 5 - Interstate-82

Base Photographic Documentation

Latitude (°): **46.1421**

Longitude (°): **-119.4917**

Viewpoint Elevation (feet): **844**

Camera Height (meters): **1.5**

Camera Heading (degrees): **356.44**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 5: View from Interstate-82 looking north - Existing Condition

KOP 5: View from Interstate-82 looking north - Simulated Condition

Bright Night HOP Hill Solar

Sun and Weather

Sunny

Date: **5-17-22**

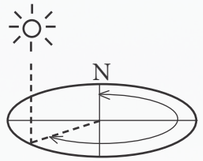
Photo Time: **7:21 AM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **80.28°**



Sun Angle: **17.72°**

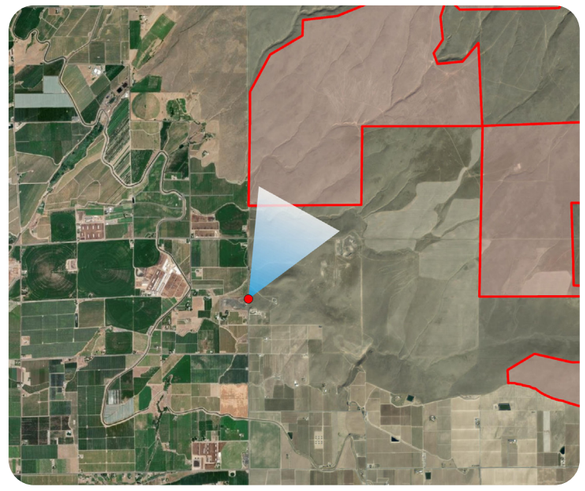
Lighting Angle on Project: **Side Lit**

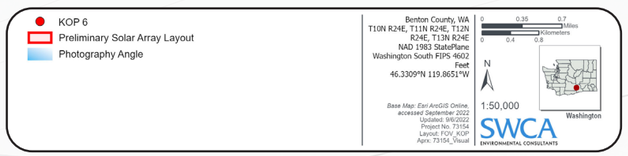
Wind: **8 mph**

Cloud Cover: **55%**

Temperature (°F): **51°F**

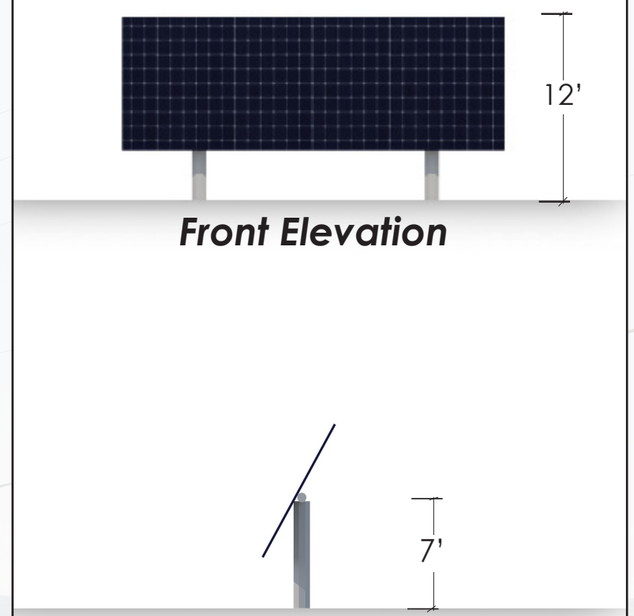
Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.





Approximate Distance to Solar Field Corridor: **1.06 miles**

Project Location



Front Elevation

Side Elevation

Structure Diagram

KOP 6 - County Line Road

Base Photographic Documentation

Latitude (°): **46.1927**

Longitude (°): **-119.5225**

Viewpoint Elevation (feet): **1252**

Camera Height (meters): **1.5**

Camera Heading (degrees): **356.44**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 6: View from County Line Road looking northeast - Existing Condition

KOP 6: View from County Line Road looking northeast - Simulated Condition

Bright Night HOP Hill Solar

Sun and Weather

Sunny

Date: **5-17-22**

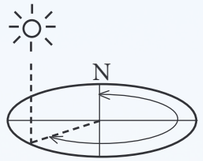
Photo Time: **8:09 AM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **88.51°**



Sun Angle: **25.75°**

Lighting Angle on Project: **Side Lit**

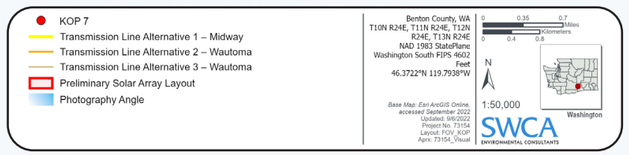
Wind: **7 mph**

Cloud Cover: **50%**

Temperature (°F): **55°F**

Transmission Structure Paint Finish Approximated in Simulation Process: **Galvanized Steel**

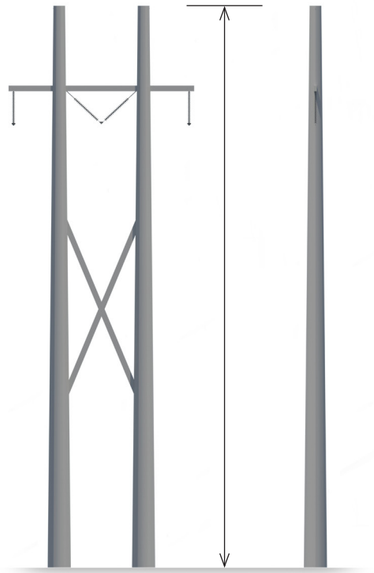
Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.



Approximate Distance to Solar Field Corridor: **0.49 miles**

Project Location

Height to Tip of Structures: **100 feet**



Front Elevation — Side Elevation

Structure Diagram

KOP 7 - North Missimer Road

Base Photographic Documentation

Latitude (°): **46.2238**

Longitude (°): **-119.4724**

Viewpoint Elevation (feet): **2280**

Camera Height (meters): **1.5**

Camera Heading (degrees): **228.88**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 7: View from North Missimer Road looking southwest - Existing Condition

KOP 7: View from North Missimer Road looking southwest - Simulated Condition

Bright Night HOP Hill Solar

Sun and Weather

Sunny

Date: **5-17-22**

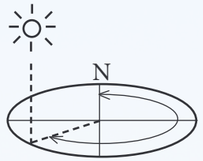
Photo Time: **8:09 AM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **88.51°**



Sun Angle: **25.75°**

Lighting Angle on Project: **Side Lit**

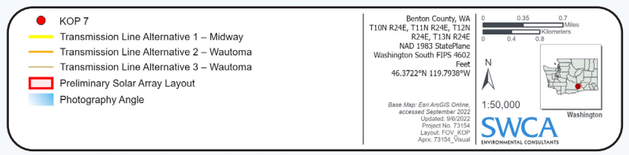
Wind: **7 mph**

Cloud Cover: **50%**

Temperature (°F): **55°F**

Transmission Structure Paint Finish Approximated in Simulation Process:
Self Weathering Steel

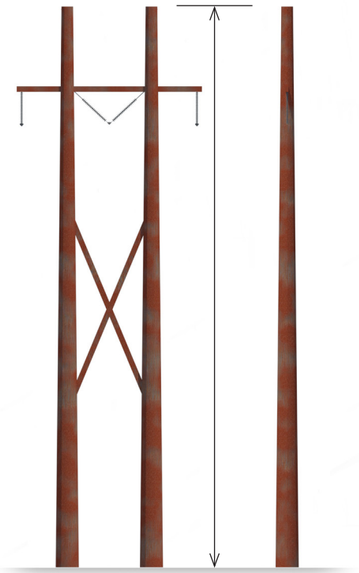
Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.



Approximate Distance to Solar Field Corridor: **0.49 miles**

Project Location

Height to Tip of Structures: **100 feet**



Front Elevation — Side Elevation

Structure Diagram

KOP 7 - North Missimer Road

Base Photographic Documentation

Latitude (°): **46.2238**

Longitude (°): **-119.4724**

Viewpoint Elevation (feet): **2280**

Camera Height (meters): **1.5**

Camera Heading (degrees): **228.88**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 7: View from North Missimer Road looking southwest - Existing Condition

KOP 7: View from North Missimer Road looking southwest - Simulated Condition

Bright Night HOP Hill Solar

Sun and Weather

Sunny

Date: **5-17-22**

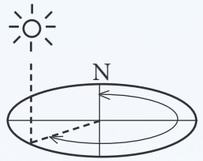
Photo Time: **8:09 AM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth: **88.51°**



Sun Angle: **25.75°**

Lighting Angle on Project: **Side Lit**

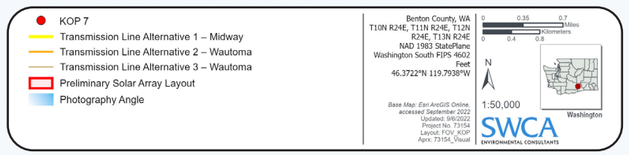
Wind: **7 mph**

Cloud Cover: **50%**

Temperature (°F): **55°F**

Transmission Structure Paint Finish Approximated in Simulation Process: **Wood**

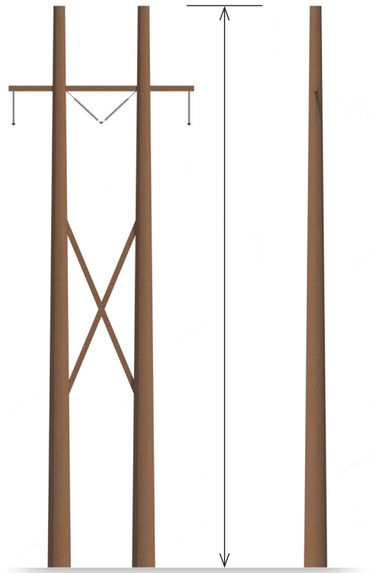
Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.



Approximate Distance to Solar Field Corridor: **0.49 miles**

Project Location

Height to Tip of Structures: **100 feet**



Front Elevation — Side Elevation

Structure Diagram

KOP 7 - North Missimer Road

Base Photographic Documentation

Latitude (°): **46.2238**

Longitude (°): **-119.4724**

Viewpoint Elevation (feet): **2280**

Camera Height (meters): **1.5**

Camera Heading (degrees): **228.88**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 7: View from North Missimer Road looking southwest - Existing Condition

KOP 7: View from North Missimer Road looking southwest - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-17-22**

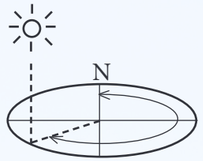
Photo Time: **10:18 AM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth:



115.68°

Sun Angle: **47.3°**

Lighting Angle on Project: **Side Lit**

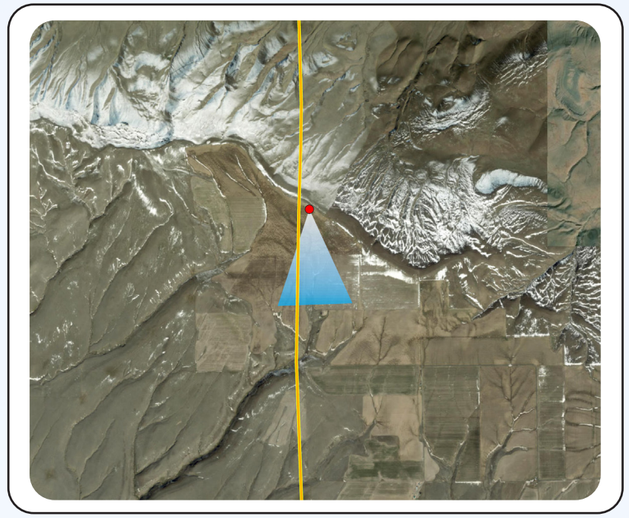
Wind: **7 mph**

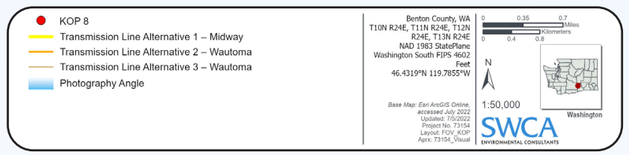
Cloud Cover: **51%**

Temperature (°F): **61°F**

Transmission Structure Paint Finish Approximated in Simulation Process:
Galvanized Steel

Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.

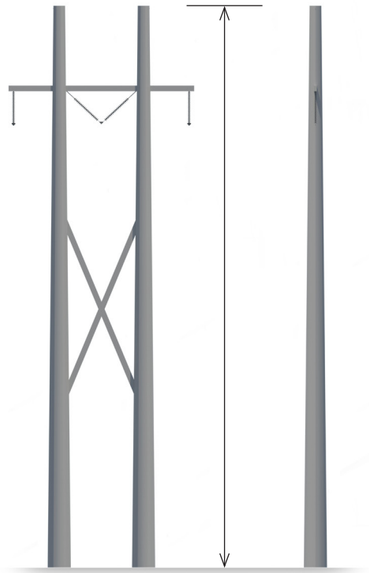




Approximate Distance to Solar Field Corridor: **0.53 miles**

Project Location

Height to Tip of Structures: **100 feet**



Front Elevation — Side Elevation

Structure Diagram

KOP 8 - Bennett Road

Base Photographic Documentation

Latitude (°): **46.2514**

Longitude (°): **-119.4717**

Viewpoint Elevation (feet): **2714**

Camera Height (meters): **1.5**

Camera Heading (degrees): **178.91**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 8: View from T-Line near Bennett Road looking south - Existing Condition

KOP 8: View from T-Line near Bennett Road looking south - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-17-22**

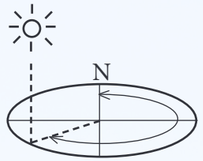
Photo Time: **10:18 AM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth:



115.68°

Sun Angle: **47.3°**

Lighting Angle on Project: **Side Lit**

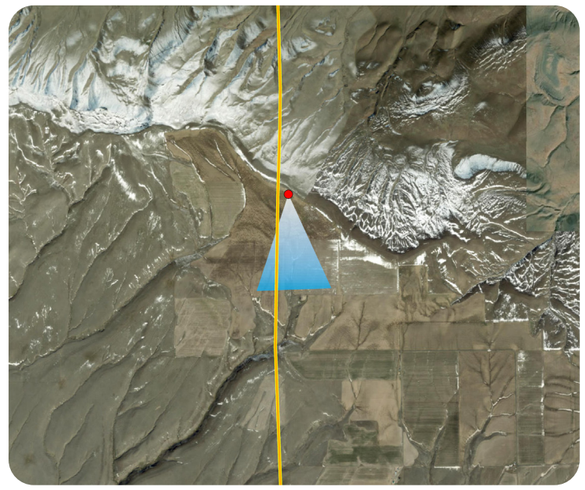
Wind: **7 mph**

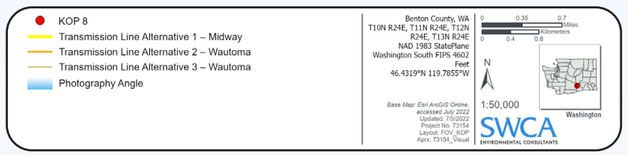
Cloud Cover: **51%**

Temperature (°F): **61°F**

Transmission Structure Paint Finish Approximated in Simulation Process:
Self Weathering Steel

Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.

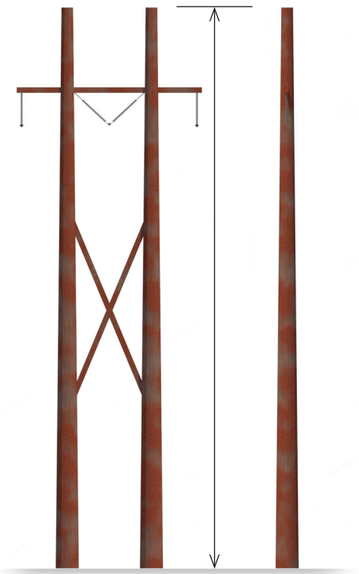




Approximate Distance to Solar Field Corridor: **0.53 miles**

Project Location

Height to Tip of Structures: **100 feet**



Front Elevation — Side Elevation

Structure Diagram

KOP 8 - Bennett Road

Base Photographic Documentation

Latitude (°): **46.2514**

Longitude (°): **-119.4717**

Viewpoint Elevation (feet): **2714**

Camera Height (meters): **1.5**

Camera Heading (degrees): **178.91**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 8: View from T-Line near Bennett Road looking south - Existing Condition

KOP 8: View from T-Line near Bennett Road looking south - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-17-22**

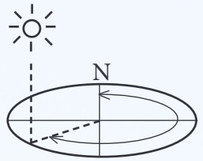
Photo Time: **10:18 AM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth:



115.68°

Sun Angle: **47.3°**

Lighting Angle on Project: **Side Lit**

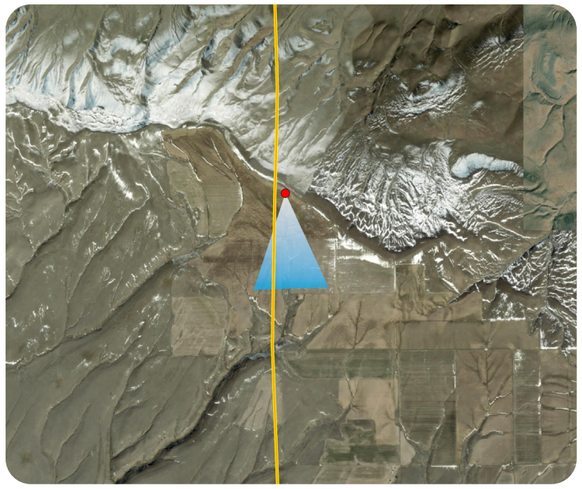
Wind: **7 mph**

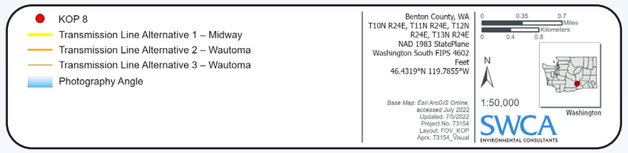
Cloud Cover: **51%**

Temperature (°F): **61°F**

Transmission Structure Paint Finish Approximated in Simulation Process: **Wood**

Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.

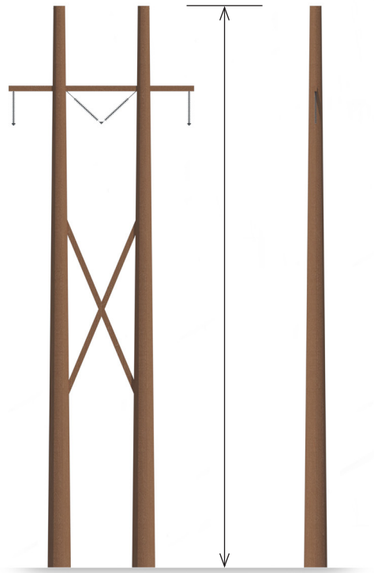




Approximate Distance to Solar Field Corridor: **0.53 miles**

Project Location

Height to Tip of Structures: **100 feet**



Front Elevation — Side Elevation

Structure Diagram

KOP 8 - Bennett Road

Base Photographic Documentation

Latitude (°): **46.2514**

Longitude (°): **-119.4717**

Viewpoint Elevation (feet): **2714**

Camera Height (meters): **1.5**

Camera Heading (degrees): **178.91**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

SWCA® ENVIRONMENTAL CONSULTANTS

KOP 8: View from T-Line near Bennett Road looking south - Existing Condition

KOP 8: View from T-Line near Bennett Road looking south - Simulated Condition

Bright Night Hop Hill Solar

Sun and Weather

Sunny

Date: **5-17-22**

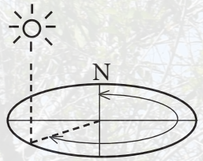
Photo Time: **12:03 PM**

Visibility:

Good — Poor

Air Quality: Good

Sun Azimuth:



152.16°

Sun Angle: **60.45°**

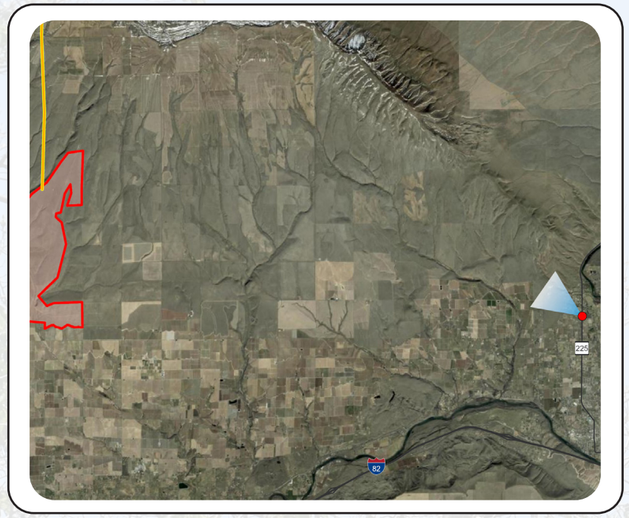
Lighting Angle on Project: **Side Lit**

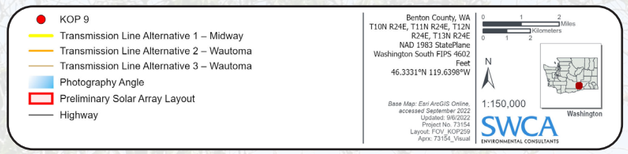
Wind: **7 mph**

Cloud Cover: **67%**

Temperature (°F): **55°F**

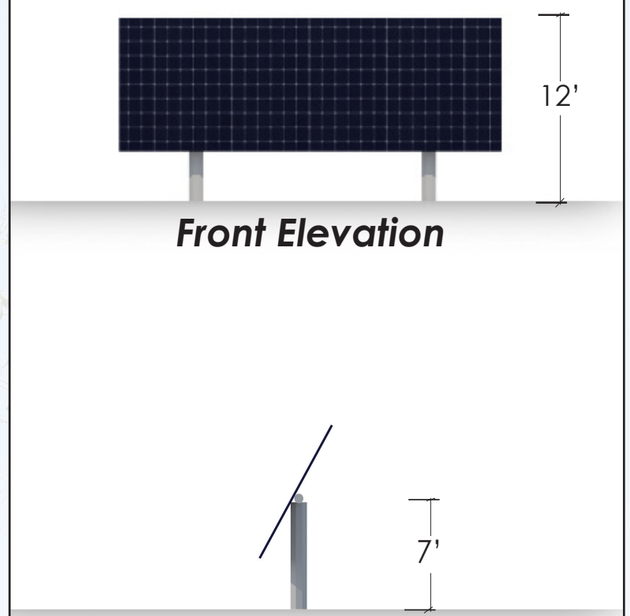
Simulation was prepared using information provided by client. Locations, colors, and heights may vary based on final engineering and design.





Approximate Distance to Solar Field Corridor: **15.27 miles**

Project Location



Front Elevation

Side Elevation

Structure Diagram

KOP 9 - Washington State Route 225

Base Photographic Documentation

Latitude (°): **46.1850**

Longitude (°): **-119.2937**

Viewpoint Elevation (feet): **604**

Camera Height (meters): **1.5**

Camera Heading (degrees): **291.12**

Camera Make & Model: **Nikon D5600**

Camera Sensor Size (mm): **23.6 x 15.6**

Crop Factor: **1.53**

Lens Make & Model: **AF-P Nikkor**

Lens Focal Length (mm): **32**

Image Size (pixels): **6000 x 4000**

Single frame simulation approximates 50mm full frame equivalent.

Viewing Instructions: Printed at 100% the resulting simulation is 16 inches wide by 10 inches high. At this size and focal length, the simulation should be viewed at arms length (24 inches). If viewed on a computer monitor, scale should be 100%.

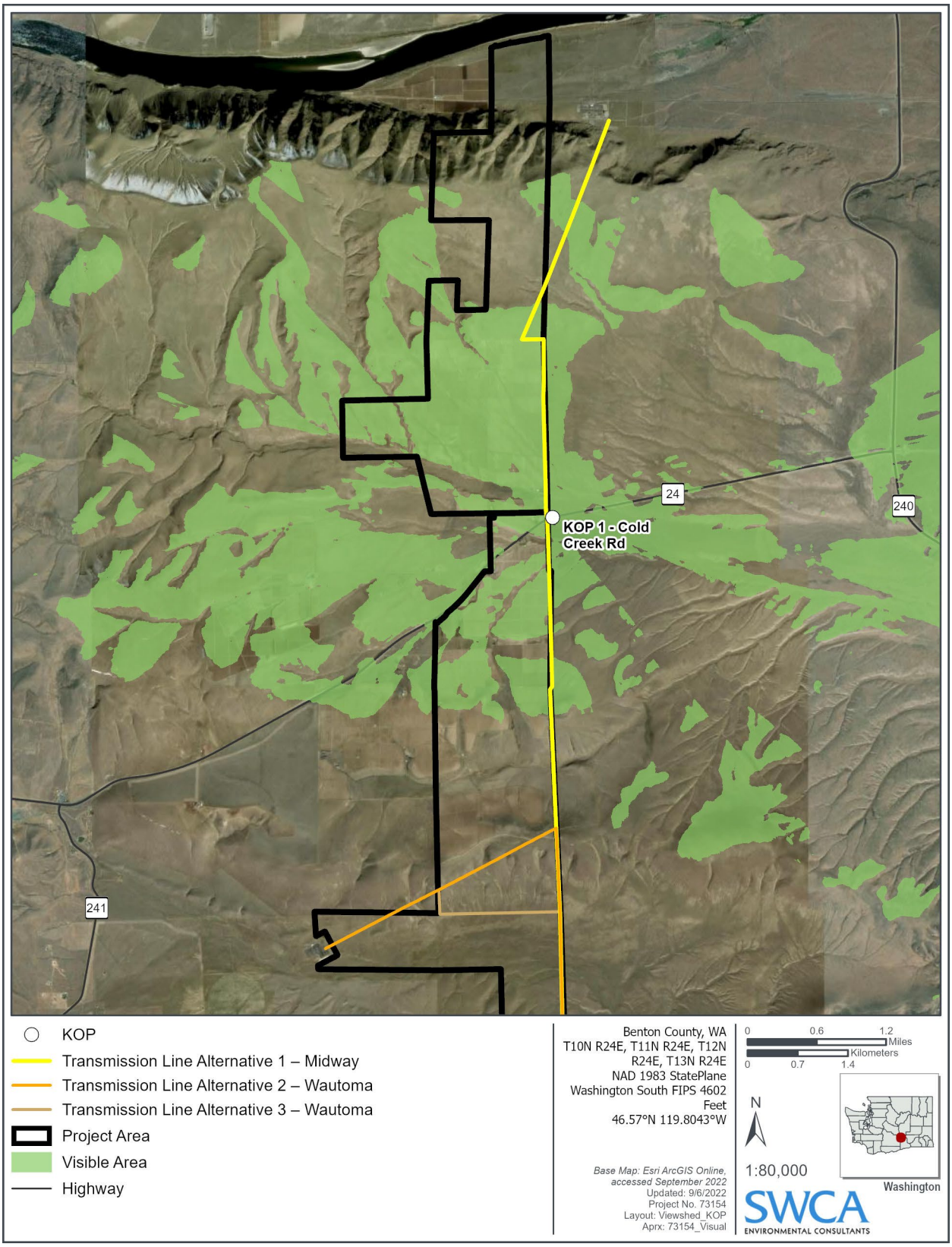
SWCA® ENVIRONMENTAL CONSULTANTS

KOP 9: View from Washington State Route 225 and Accord Road looking northwest - Existing Condition

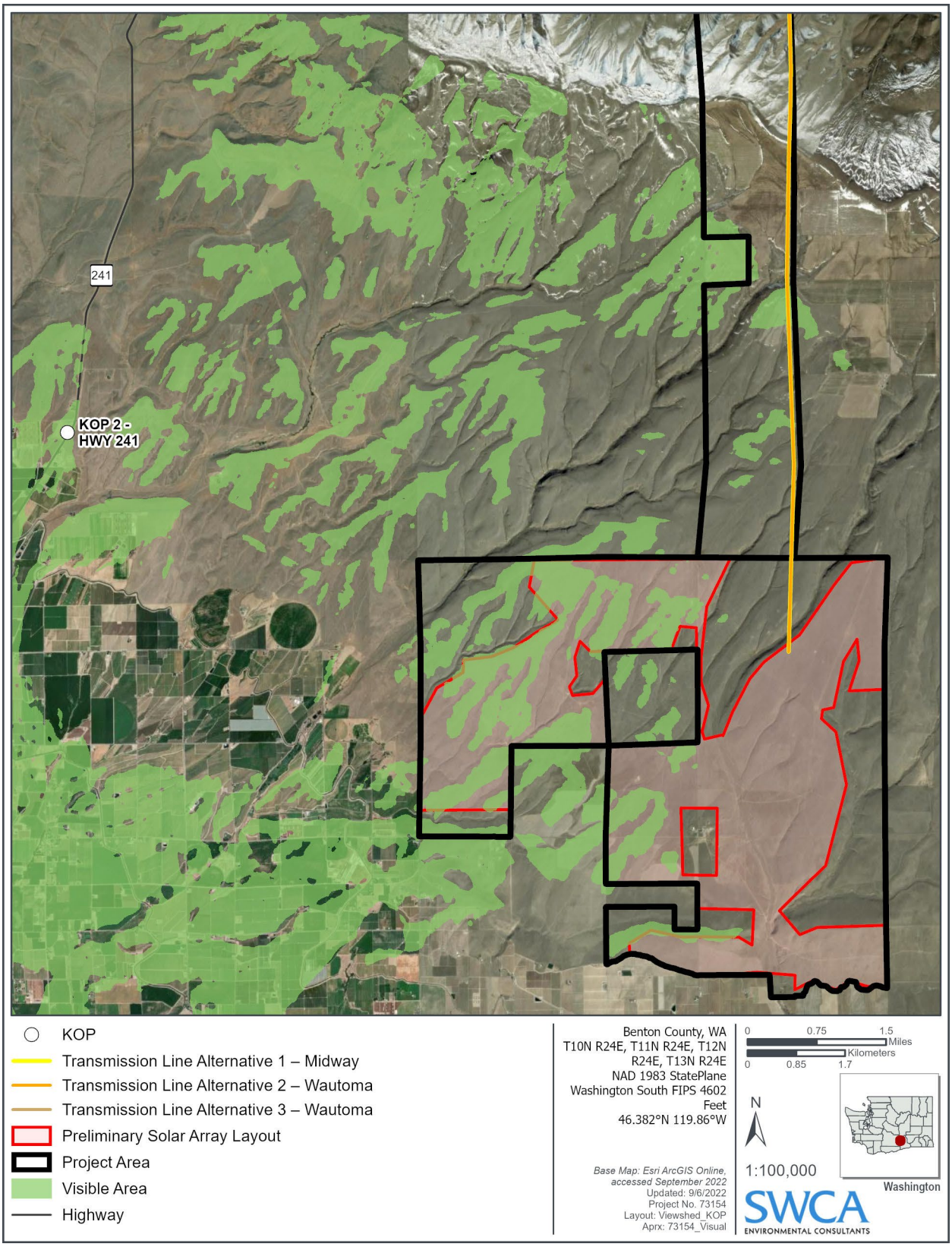
KOP 9: View from Washington State Route 225 and Accord Road looking northwest - Simulated Condition

APPENDIX C

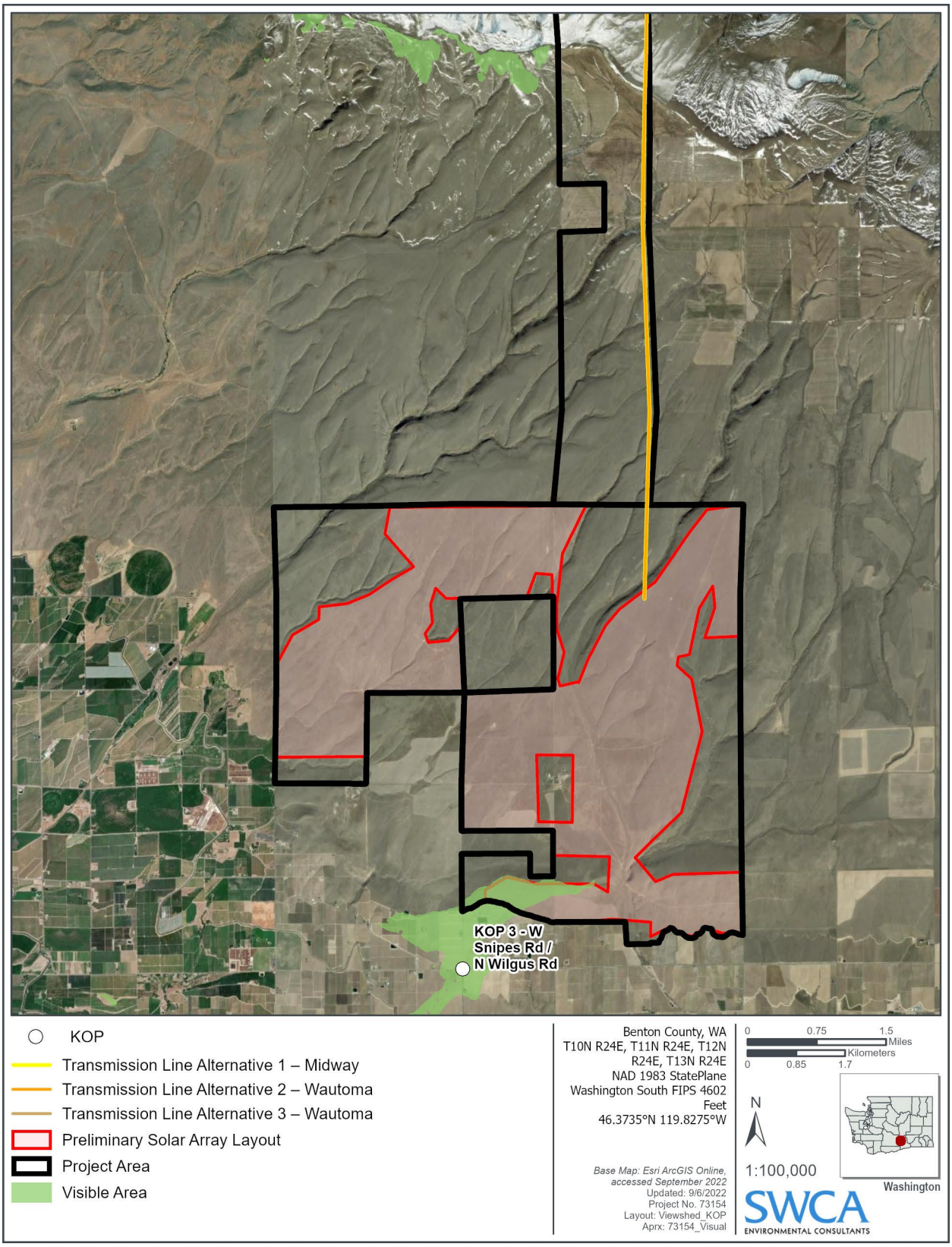
KOP Viewsheds



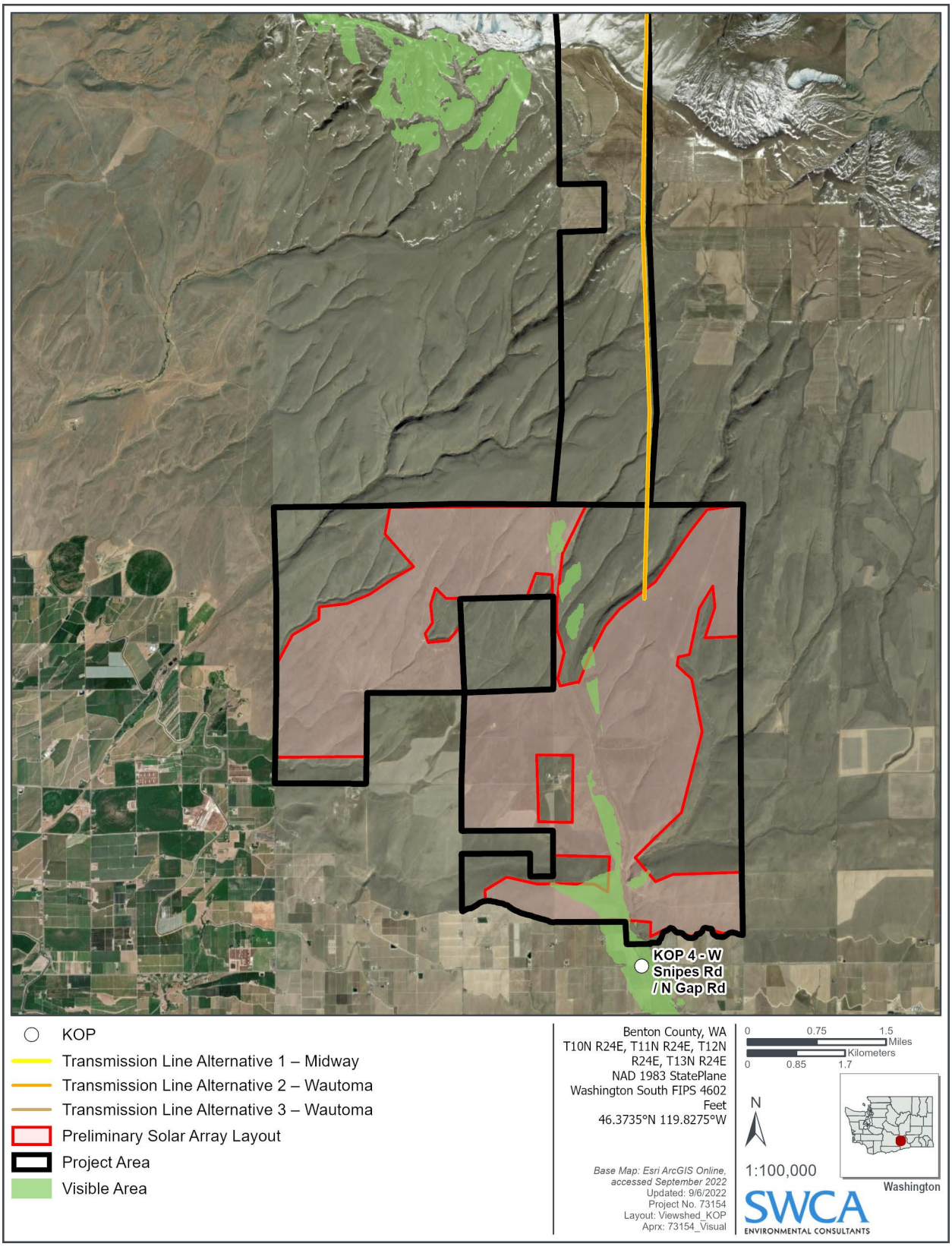
Appendix C Figure 1. KOP 1 – Cold Creek Road.



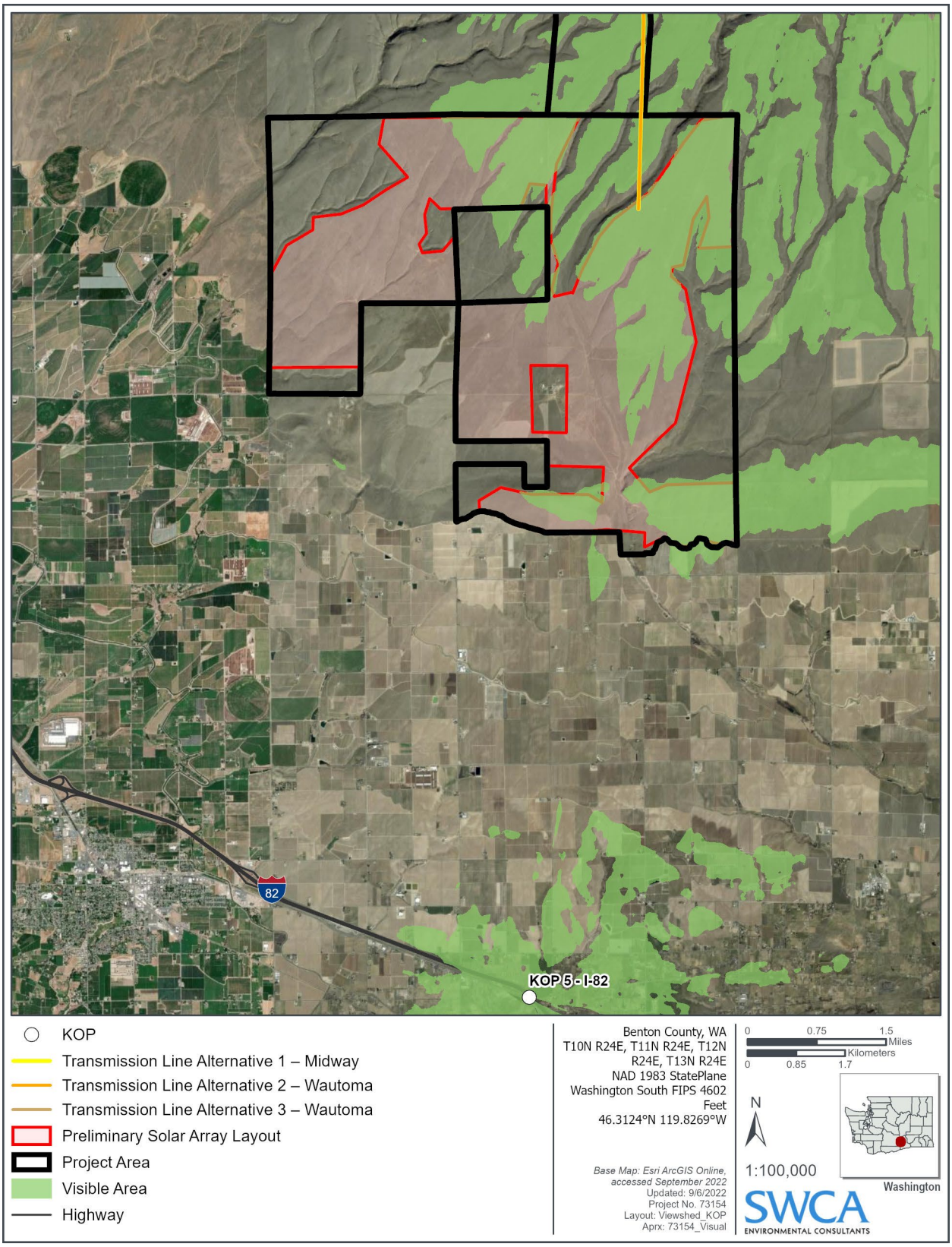
Appendix C Figure 2. KOP 2 – HWY 241.



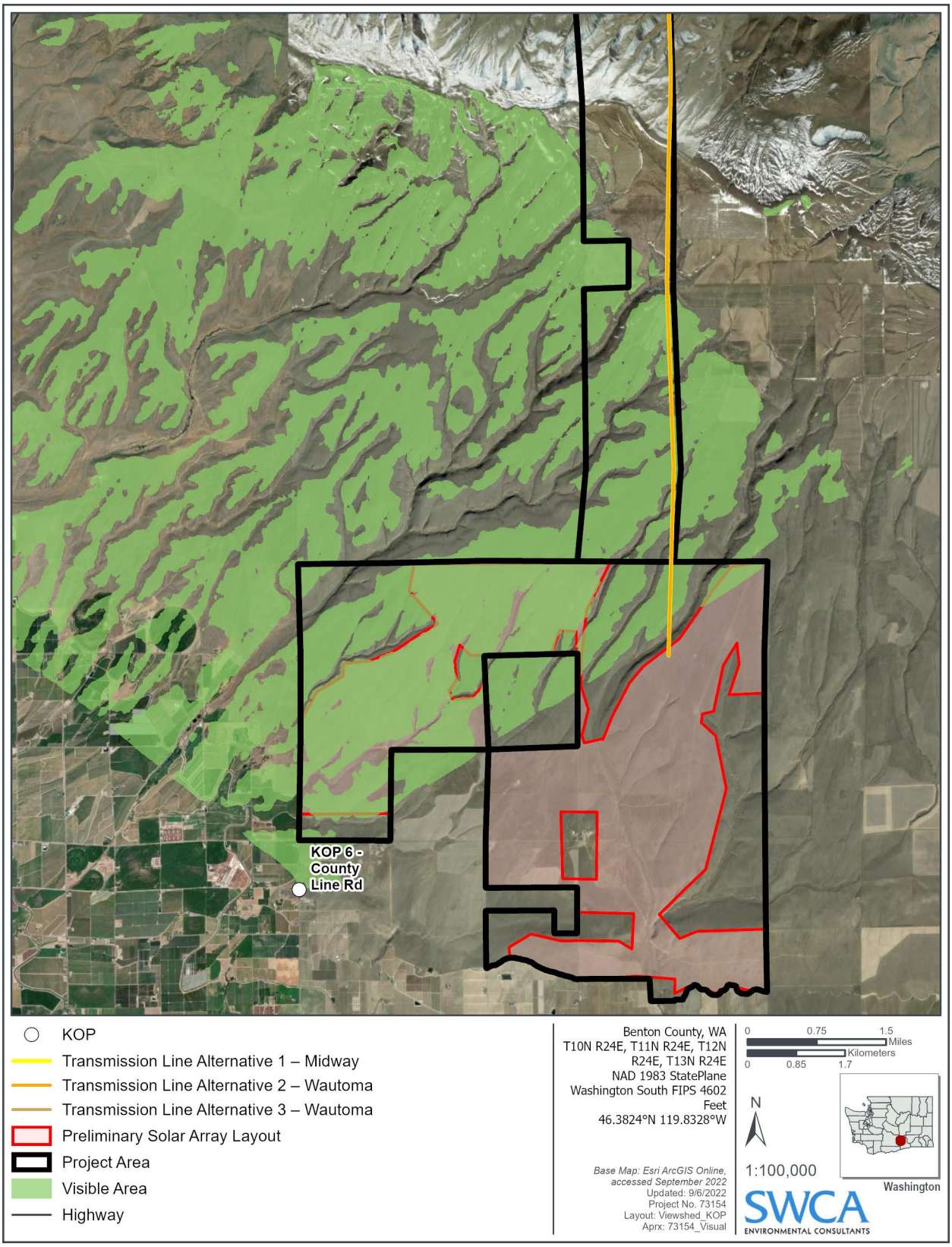
Appendix C Figure 3. KOP 3 – W Snipes Road and N Wilgus Road.



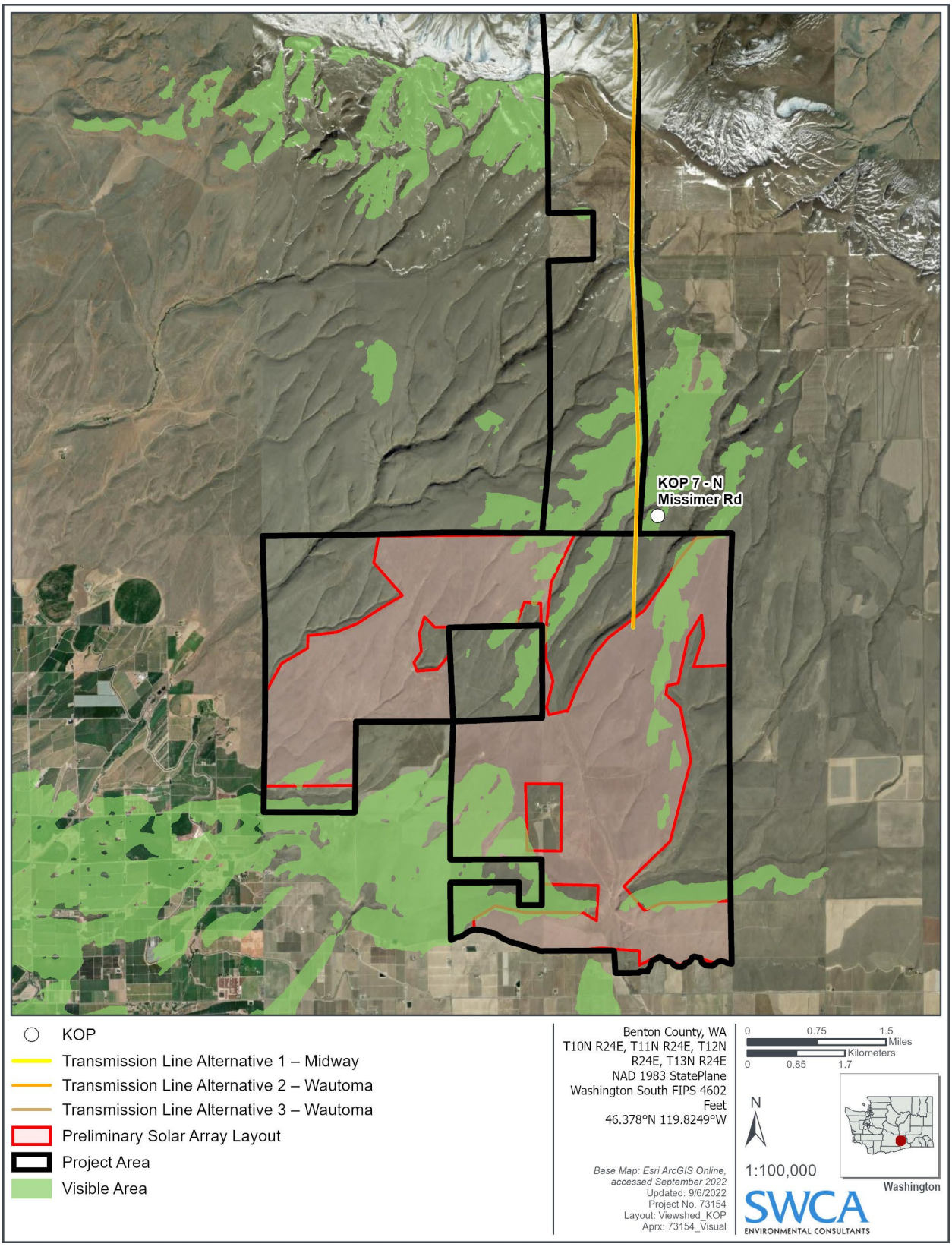
Appendix C Figure 4. KOP 4 – W Snipes Road and N Gap Road.



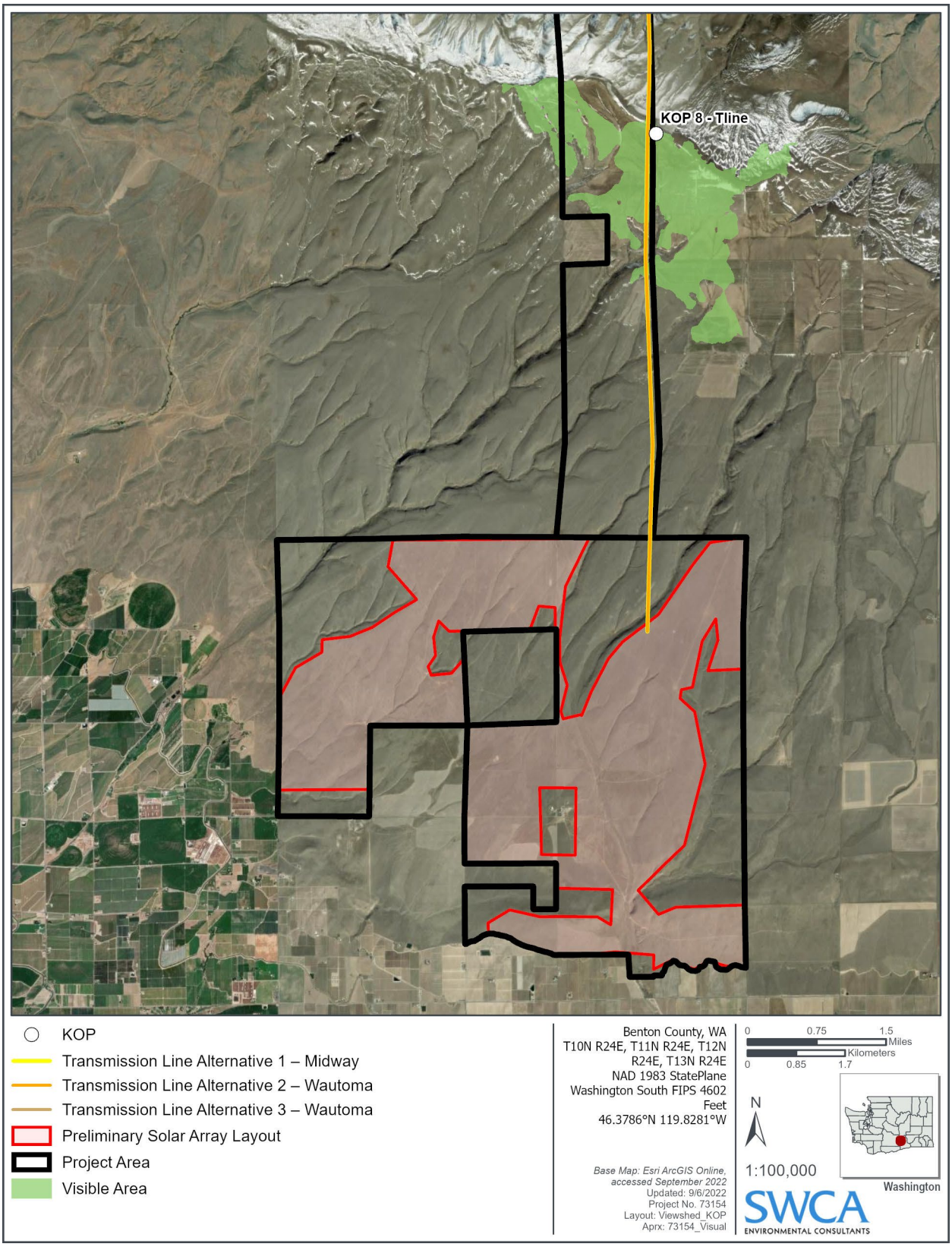
Appendix C Figure 5. KOP 5 – Interstate 82.



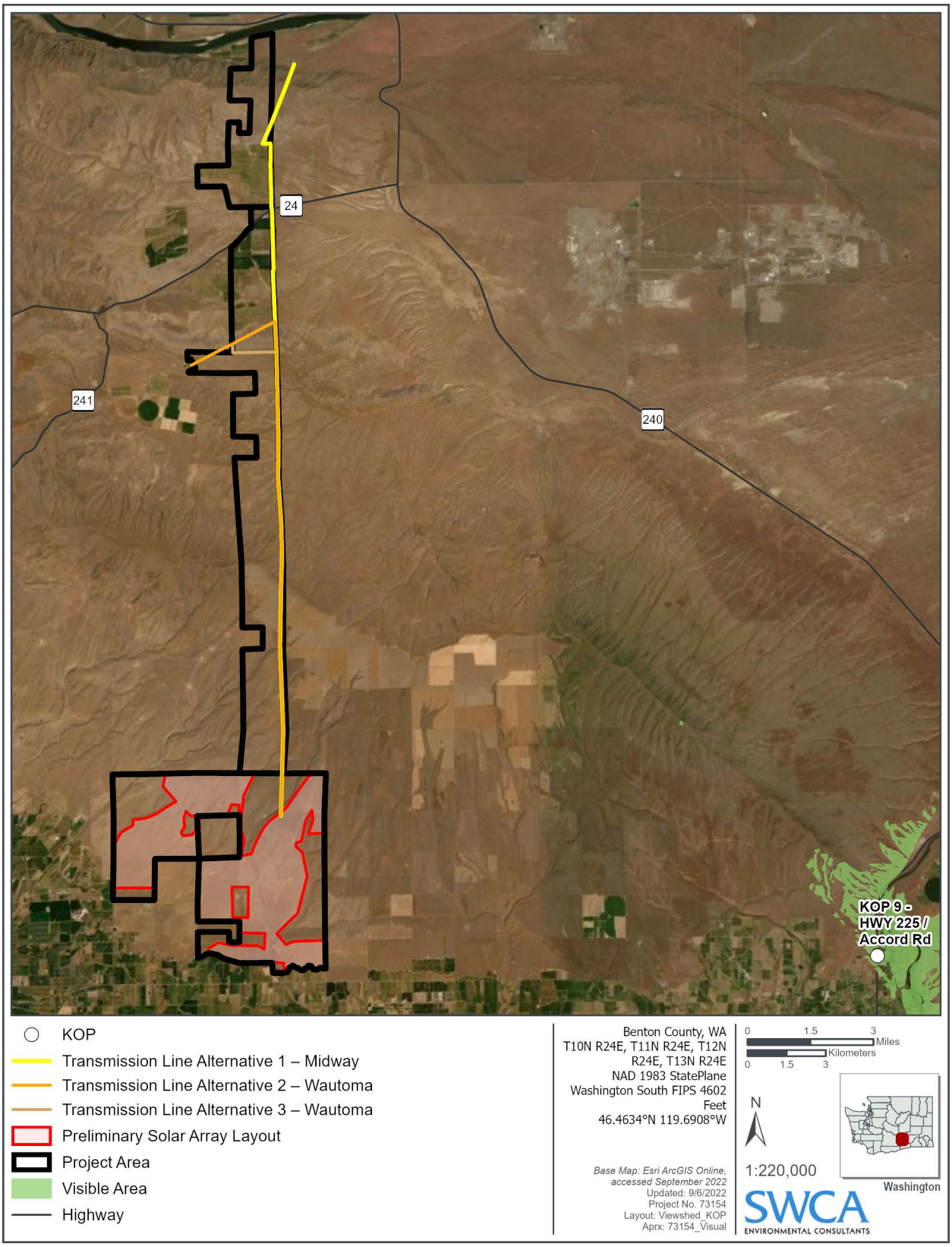
Appendix C Figure 6. KOP 6 – County Line Road.



Appendix C Figure 7. KOP 7 – N Missimer Road.



Appendix C Figure 8. KOP 8 – T Line.



Appendix C Figure 9. KOP 9 – HWY 225 and Accord Road.

APPENDIX D

Glare Analysis Report

SWCA®
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Portland, Oregon 97209
Tel 503.224.0333 Fax 503.224.0229
www.swca.com

TECHNICAL MEMORANDUM

To: BrightNight Energy, LLC

From: Spenser Branch, Visual Resources Specialist

Date: March 29, 2022

Re: **Glint and Glare Assessment, Hop Hill Solar Energy Project, Benton County, Washington / SWCA Project No. 69535**

INTRODUCTION

BrightNight Energy, LLC (the applicant), proposes to construct, operate, and maintain the Hop Hill Solar Energy Project. The project consists of a proposed utility-scale, solar photovoltaic (PV) power plant on approximately 4,000 acres of agriculture zoned land just north of Highway 121 near Rattlesnake Ridge, Yakima County, Washington (the project area). Additional project features include temporary and permanent access roads, solar trackers, junction boxes, a step-up transformer/on-site substation, drainage and discharge facilities, a 230-kilovolt generation tie line, and groundwater wells for use during construction.

Purpose

The purpose of this memorandum is to summarize potential glinting and glare effects of the project. Based on the results of these effects, potential health, safety, and visual mitigation measures associated with these glinting and glare effects may be proposed. For the purposes of this memo, *glint* is defined as a bright, momentary flash of light; *glare* is defined as a more continuous and sustained presence of light that may appear to "sparkle" from public viewing locations.

The source of potential glint and glare for the project is proposed PV panels. However, PV panel surfaces are designed specifically not to reflect light, thus reducing the potential for glint and glare.

GLINT AND GLARE ANALYSIS

Analysis for the Hop Hill Solar Energy Project used the GlareGauge (also known as Solar Glare Hazard Analysis Tool [SGHAT]) model developed by Forge Solar and the U.S. Department of Energy's Sandia National Laboratories to evaluate potential glare. The analysis focused on potential glare effects on observation points and linear travel routes. Aircraft landing and approach were considered; the proposed Hop Hill Solar Energy Project area is 4.5 miles east-northeast of Sunnyside Municipal Airport and over 8 miles from Prosser Airport. While the project is not located on airport property and therefore not subject to Federal Aviation Administration (FAA) jurisdiction under Federal Aviation Regulations Part 77 to protect airspace safety, and is located beyond the 2-mile final approach as defined in the Interim Solar Policy, the applicant has sought to voluntarily apply FAA ocular hazard standards (78 *Federal Register* 63276).

These results comply with the FAA standards described in the Interim Solar Policy.

Software

GlareGauge employs an interactive Google map where the user can quickly locate a site, draw an outline of the proposed solar energy system, and specify observer locations and, if needed, aircraft approach paths. Latitude, longitude, and elevation are automatically recorded through the Google interface, providing necessary information for sun position and vector calculations. Additional information regarding the orientation and tilt of the solar energy panels, reflectance, environment, and ocular factors are entered by the user.

If glare is found, the tool calculates the retinal irradiance and subtended source angle (size/distance) of the glare source to predict potential ocular hazards ranging from a temporary afterimage to retinal burn. The results are presented in a simple, easy-to-interpret plot that specifies when glare will occur throughout the year, with color codes indicating the potential ocular hazard. The tool can also predict relative energy production while evaluating alternative designs, layouts, and locations to identify configurations that maximize energy production while mitigating the impacts of glare.

Assumptions

- The proposed solar project will operate 365 days per year, during daylight hours.
- "Green" glare is glare with low potential to cause an afterimage (flash blindness) when observed prior to a typical blink response time.
- "Yellow" glare is glare with potential to cause an afterimage (flash blindness) when observed prior to a typical blink response time.
- Times associated with glare are denoted in standard time.
- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover, and geographic obstructions.
- Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array subsections can provide additional information on expected glare.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size.
- Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
- The glare hazard determination relies on several approximations, including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.

- Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.[1]

Input Parameters

The GlareGauge inputs the specifications of the array including a single-axis tracking system with a north-south orientation, maximum tracking angle of 60°, and a panel height of 7 feet above ground level. SWCA Environmental Consultants also assumed a smooth panel surface with anti-reflective coating to provide maximum flexibility in module selection. Modeling was then undertaken for the applicable sensitive receptors: observation points (OPs) from a casual observer (e.g., hikers, equestrians). No air traffic control towers were included.

All of the modeling result output sheets are provided as Attachment M-1.

Results

OPs used a height of 6 feet, and route receptors used a height of 4 feet (an average height of passenger cars, trucks, and diesel trucks).

Table 1. Glare Observation Points

Name	Description
OP 1: Residence	Private residence near project area
OP 2: Residence	Private residence near project area
OP 3: Residence	Private residence near project area
OP 4: Residence	Private residence near project area
OP 5: Residence	Private residence near project area
OP 6: Residence	Private residence near project area
OP 7: Residence	Private residence near project area
OP 8: Residence	Private residence near project area
OP 9: Residence	Private residence near project area
OP 10: Route Receptor Anderson Road	Main east-west travel route
OP 11: Route Receptor Anderson Road	Main east-west travel route
OP 12: Route Receptor Anderson Road	Main east-west travel route

Glint and Glare Effects Discussion

The Hop Hill Solar Energy Project has the possibility to create low-potential afterimage (green ocular impact) glare for the route receptor, Anderson Road, traveling east-west through the proposed project area. The route receptor will have potential for glare up to 10,269 minutes per year; the glare would occur from middle of May to end of July, within the hours of 4:00 a.m. to 6:00 a.m. and 6:00 p.m. to 8:00 p.m., resulting in a total of approximately 4 hours per day.

RECOMMENDATIONS

Mitigation measures such as the use of non-reflective materials, finishes, and surface treatments on project components would reduce contrast and glare. Visual (vegetation) barriers are the most effective at

[1] Refer to www.forgesolar.com/help/ for assumptions and limitations not listed here.

mitigating glare from solar arrays when the vegetation is located as close to the source as possible. If vegetation is used, native and naturalized plants should be specified to match or complement existing vegetation within the area. Existing vegetation within and surrounding the project area should be maintained and preserved to the greatest extent possible. Preserving existing vegetation will reduce the project's overall impact on the existing health of soils, wildlife, cost, and visual aesthetics.

ATTACHMENT M-1

GlareGauge Output Model Report

FORGESOLAR GLARE ANALYSIS

Project: **69535_Hop Hill Solar**
Site configuration: **Hop Hill Solar**
Analysis conducted by Ryan Rausch (rrausch@swca.com) at 21:31 on 25 Mar, 2022.

U.S. FAA 2013 Policy Adherence

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

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

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

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	PASS	Flight path receptor(s) do not receive yellow glare
ATCT(s)	N/A	No ATCT receptors designated

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

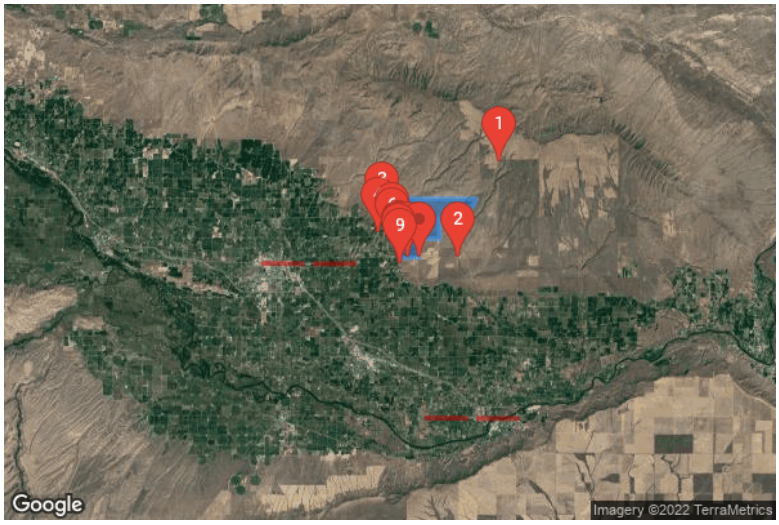
- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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

SITE CONFIGURATION

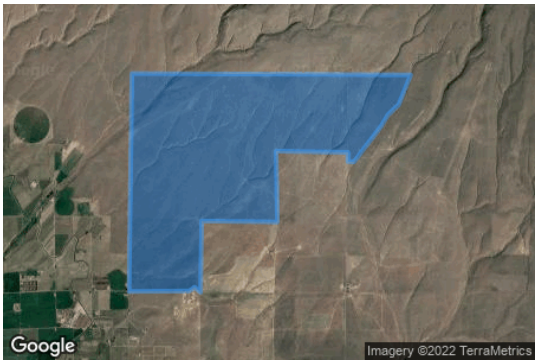
Analysis Parameters

DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 66708.11775
Methodology: V2



PV Array(s)

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Ground Coverage Ratio: 0.5
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	46.331590	-119.873510	1209.24	7.00	1216.24
2	46.331679	-119.856001	1347.96	7.00	1354.96
3	46.332449	-119.854499	1336.76	7.00	1343.76
4	46.331441	-119.852739	1292.70	7.00	1299.70
5	46.345663	-119.852396	1353.72	7.00	1360.72
6	46.345456	-119.830423	1525.49	7.00	1532.49
7	46.359617	-119.830782	1717.22	7.00	1724.22
8	46.359365	-119.809904	1874.74	7.00	1881.74
9	46.357529	-119.809947	1845.07	7.00	1852.07
10	46.357469	-119.808187	1814.62	7.00	1821.62
11	46.364595	-119.800290	1944.49	7.00	1951.49
12	46.366846	-119.798316	1972.78	7.00	1979.78
13	46.368889	-119.795183	2017.67	7.00	2024.67
14	46.374367	-119.791965	2101.79	7.00	2108.79
15	46.374841	-119.791707	2115.53	7.00	2122.53
16	46.375099	-119.872650	1596.74	7.00	1603.74

Flight Path Receptor(s)

Name: Prosser Airport - East
Description:
Threshold height: 50 ft
Direction: 270.2°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	46.213345	-119.789118	681.18	50.00	731.18
Two-mile	46.213234	-119.747286	697.64	586.99	1284.64

Name: Prosser Airport - West
Description:
Threshold height: 50 ft
Direction: 90.6°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	46.213434	-119.802185	702.45	50.00	752.45
Two-mile	46.213762	-119.844014	748.51	557.40	1305.91

Name: Sunnyside Municipal Airport - East
Description:
Threshold height: 50 ft
Direction: 269.6°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	46.327018	-119.963790	762.85	50.00	812.86
Two-mile	46.327200	-119.921873	900.75	465.56	1366.31

Name: Sunnyside Municipal Airport - West
Description:
Threshold height: 50 ft
Direction: 90.5°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
Threshold	46.327151	-119.976965	737.63	50.00	787.63
Two-mile	46.327404	-120.018882	740.19	600.90	1341.09

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	46.402155	-119.767164	2703.79	6.00
OP 2	2	46.332127	-119.811383	1512.01	6.00
OP 3	3	46.360961	-119.891323	1308.83	6.00
OP 4	4	46.349706	-119.895185	1161.06	6.00
OP 5	5	46.345603	-119.881173	1178.61	6.00
OP 6	6	46.342403	-119.881131	1192.95	6.00
OP 7	7	46.332639	-119.873979	1216.91	6.00
OP 8	8	46.330635	-119.874022	1198.92	6.00
OP 9	9	46.327482	-119.873175	1192.31	6.00
OP 10	10	46.331497	-119.873518	1208.55	4.00
OP 11	11	46.331487	-119.864752	1263.11	4.00
OP 12	12	46.331291	-119.851510	1297.45	4.00

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PV array 1	SA tracking	SA tracking	10,269	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
Prosser Airport - East	0	0
Prosser Airport - West	0	0
Sunnyside Municipal Airport - East	0	0
Sunnyside Municipal Airport - West	0	0
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	10269	0
OP 12	0	0

Results for: PV array 1

Receptor	Green Glare (min)	Yellow Glare (min)
Prosser Airport - East	0	0
Prosser Airport - West	0	0
Sunnyside Municipal Airport - East	0	0
Sunnyside Municipal Airport - West	0	0
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0
OP 6	0	0
OP 7	0	0
OP 8	0	0
OP 9	0	0
OP 10	0	0
OP 11	10269	0
OP 12	0	0

Flight Path: Prosser Airport - East

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Prosser Airport - West

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Sunnyside Municipal Airport - East

0 minutes of yellow glare
0 minutes of green glare

Flight Path: Sunnyside Municipal Airport - West

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 1

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 6

0 minutes of yellow glare

0 minutes of green glare

Point Receptor: OP 7

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 8

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 9

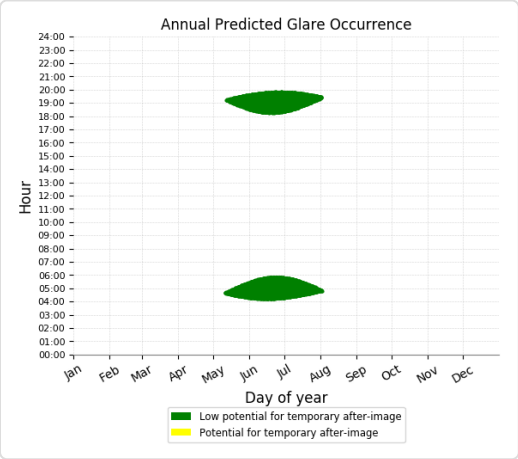
0 minutes of yellow glare
0 minutes of green glare

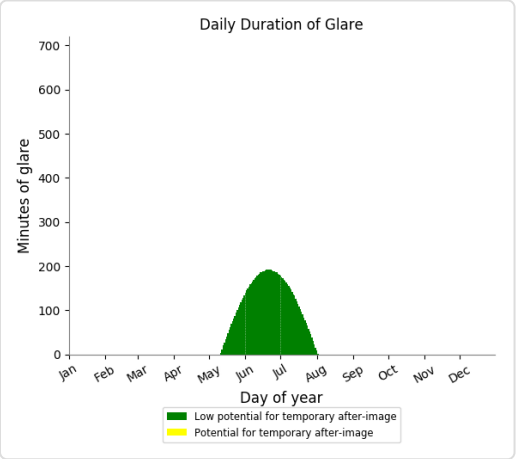
Point Receptor: OP 10

0 minutes of yellow glare
0 minutes of green glare

Point Receptor: OP 11

0 minutes of yellow glare
10269 minutes of green glare





Point Receptor: OP 12

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.