

Landscape Plan

Telesto Energy Project

May 2022

E319302605



Document Information

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1 Introduction

Telesto Energy Project, LLC (Telesto) is proposing to construct the Telesto Energy Project (Project) near Elizabethtown, Kentucky. The proposed Project will have a generation capacity of 110 megawatts (MW). The Project is proposed to be constructed within an approximate area of 1,273.5 acres (1.98 square miles) of private leased land and easements (Project Area). The Project Area is located in Hardin County, Kentucky. As part of the development of this site, Cardno, Inc. has worked with Telesto to develop a landscape plan to help mitigate any visual impacts of the Project from roadways and adjacent land uses while maintaining a natural character that fits within the context and character of the existing landscape. General information about proposed design methodology, plant materials, and planting modules are included in this document.

The Project will be visible from various roadways and properties (see *Visual Resource Assessment*), including both participating and non-participating landowners. It is important that visual mitigation be considered differently for areas depending on the adjacent uses, intensity of viewership, viewsheds and overall contextual relationship to the Project. Specific treatment modules as outlined in this plan are designed to be replicable and are able to be prescribed in various scenarios around the Project.

With any site, plant community composition varies due to differences in topography, soils, sun exposure, and other factors. It is important to not only recognize what plants are appropriate for a region, but also for a specific site. This landscape plan proposes to utilize native landscape material that will be well adapted to the climate of this region. Native plants also provide long term maintenance benefits as well as ecological benefits for soil stabilization, water quality, wildlife habitat and pollinators. These ecological benefits will all be balanced with the need to provide visual mitigation and overall aesthetic character that will complement the existing land use and setting.

2 Design Methodology

The overall goal of the landscape plan is to provide visual interest while softening the infrastructure of the Project. Screening should be provided in higher viewership areas and where there are adjacent land uses that would require them. Screening intensity will vary based on the need to provide a visual barrier. Two specific treatment modules are proposed for this Project and are designed to be replicable and flexible in order to be prescribed in the various scenarios around the Project. The primary goals of the landscape plan are to:

1. Provide visual interest to soften the proposed infrastructure;
2. Provide screening and visual barriers that consider viewership intensity and adjacent land use;
3. Develop modules that would be appropriate for the existing landscape;
4. Utilize existing landscape where possible;
5. Avoid monocultures of same species in order to increase biodiversity and;
6. Utilize native plant material when possible.

It is important to note that the vegetation will not provide 100% screening or visual obstruction from the Project. The primary intent is to provide visual relief in order to break up the lines of the infrastructure and enhance the overall aesthetics of the Project. Existing landscape along roadways, property lines and fence rows should be maintained where possible.

3 Vegetation Protection

The Project has been sited in a way to minimize impacts to the forested lands, shrublands, wetlands, and streams within the Project area, thereby minimizing impacts to trees and woody vegetation. Project infrastructure and the maintained buffers around them will be located primarily on agriculture and open lands. In order to protect vegetation from unauthorized removal, Project drawings will clearly illustrate the limits of construction. Prior to any ground disturbing activities, the limits for clearing will be adequately flagged or staked in the field.

4 Vegetation Management

4.1 Construction

Construction activities for solar infrastructure have the potential to impact vegetation through cutting and clearing, removal of stumps and roots, and increased ground disturbance and soil exposure. In order to limit the impacts to vegetation, all clearing will be confined to the Project infrastructure footprint. In addition to solar panel arrays, typical footprints include:

- 10 feet on either side of access road centerline
- 10 feet on either side of buried collection line centerline
- 10 acres for laydown yard(s)

Project construction will require a limited area of permanent disturbance of vegetation. The majority of disturbance activities will occur in agricultural lands, and efforts to retain desirable vegetation growth will be maximized to the extent practicable. The Project will minimize clearing of tree stands within various windrow or tree lot communities. No trees greater than 3 inches in diameter at breast height (DBH) will be cut outside of the approved cutting season of October 1 through March 31. Any trees and limbs removed, with approval from Telesto, will be logged, and/or chipped, and either removed or left to remain on the land, per landowner request and as allowed under federal, state, and local regulations. Authorization to leave cleared vegetation on the land (either chipped or utilized by landowners) reduces the need for further equipment mobilization to haul cut vegetation, thereby reducing further impacts to the site; however, if removal is required, all equipment will utilize existing travel lanes to the extent practicable to reduce overland travel.

After construction, disturbed areas not used for Project infrastructure will be returned to approximate pre-construction use and capability via reclamation and revegetation. This involves the treatment of soil as necessary to preserve approximate pre-construction capability and the stabilization of the work surface in a manner consistent with the initial land use. Disturbed soils inside the Project's fence line will be re-seeded to stabilize exposed soils and control sedimentation and erosion.

4.2 Operation

During Project operation, on-site vegetation within the fence line of the Project will be regularly maintained through mowing or grazing. During maintenance inspections, the Project area will also be assessed for the growth of noxious weeds. If noxious weeds do become established, herbicide treatment may be conducted, as appropriate, by a licensed professional. All vegetation monitoring and maintenance will be conducted by an experienced and qualified contractor (see Section 7).

5 Plant Materials

The plant palette used for the modules included in this plan is based on species observed during on-site field surveys as well as known regional vegetation species. Selected species are native to Central Kentucky and exclude invasive or nuisance plants as identified by the Kentucky Department of Fish and Wildlife Resources. Existing native species that were observed at the site in some form of abundance are summarized in Table 5-1 and detailed in Appendix B.

Table 5-1 Inventory of Trees Observed in the Project Area

Scientific Name	Common Name
<i>Acer rubrum</i>	Red Maple
<i>Prunus serotina</i>	Black Cherry
<i>Quercus palustris</i>	Pin Oak
<i>Liriodendron tulipifera</i>	Tulip Tree
<i>Quercus velutina</i>	Black Oak
<i>Liriodendron tulipifera</i>	Tulip Tree

While the table above provides a comprehensive list of tree species found within the limits of the site, it is important to select species that are best suited for the Project area and the purpose of the modules (see Section 6). It is also important to add some other native species to increase diversity and provide additional benefits such as ornamental and screening value (Figure 5-1).

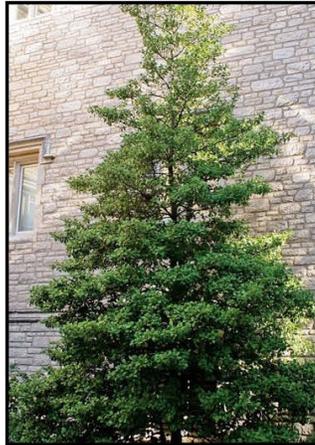
5.1 Native Plants

There are many benefits to using native plants. Most notably, they are adapted to the specific conditions of a region and are able to better tolerate weather, drought, disease, and soil conditions than non-native species. Because of these benefits, native plants generally survive longer and are easier to maintain over the course of their establishment. Native plants will also blend better into the existing landscape since many of these plants are naturally occurring in existing fields, roadsides, fence rows, etc.

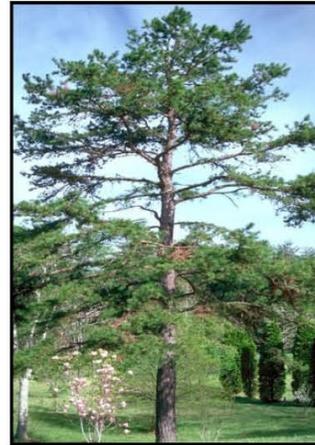
PRIMARY TREES



Eastern Cedar



American Holly



Virginia Pine

Figure 5-1 Proposed Plant Material Selection for the Telesto Energy Project

6 Planting Modules

Two modules have been developed for this Project to help soften and screen the infrastructure of the Project. These are intended to be flexible and adaptable to the various conditions that occur along the perimeter of the Project. They will be prescribed for various areas based on the need to provide screening, visual interest, softening and character to the existing landscape. Where possible, existing vegetation will be utilized along the road, fence lines and property lines. These existing areas should be incorporated into any final design and the modules should be adjusted to account for such conditions. A map of where each module is proposed is provided in Appendix A.

Module 1

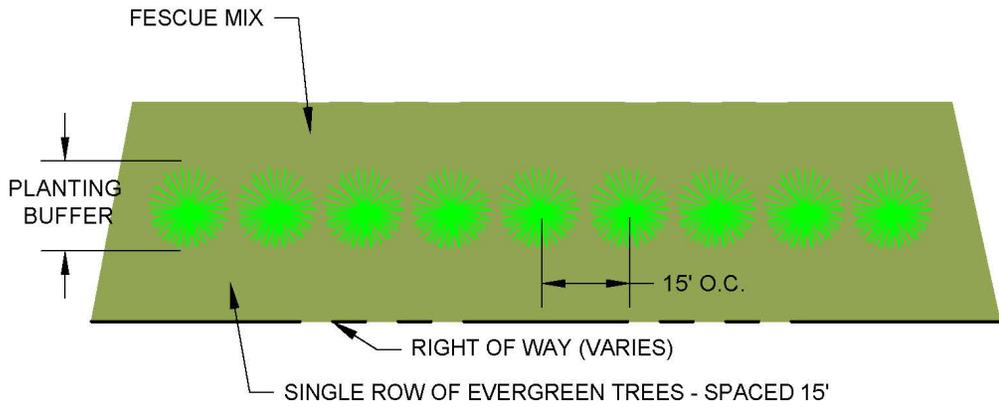
The intent of Module 1 is to provide softening, visual interest and some screening in areas of higher viewership. These areas include major/through roads where viewership is higher and the viewing period is longer. There are several areas where Module 1 would also be used to screen residential lots where the Project is set back further from the landowner lot line and not directly across or next to a residential dwelling. Along Hayden School Road is an example of a road where the project is located closer to road invoking higher viewership. The views in these areas would be more peripheral and of short duration to the passerby, but a higher number of people would be exposed to this view on a daily basis. Module 1 is comprised of a single row of evergreen trees spaced at 15 feet on center to help provide visual screening from the infrastructure of the Project (Table 6-1). Shading should be considered as to not cast shadows on the solar arrays.

Module 2

The intent of Module 2 is to provide softening, visual interest and more robust screening in areas of the highest viewership and the longest viewing period. A good example would be when a residence is located across the street or adjacent to the Project. The intent is to provide a year-round visual landscape screen for more stationary viewers while also enhancing aesthetics of the Project to non-stationary receptors. Module 2 is comprised of a double row of evergreen trees spaced at 15 feet on center to help provide visual screening from the infrastructure of the Project (Table 6-1). Shading should be considered as to not cast shadows on the solar arrays.

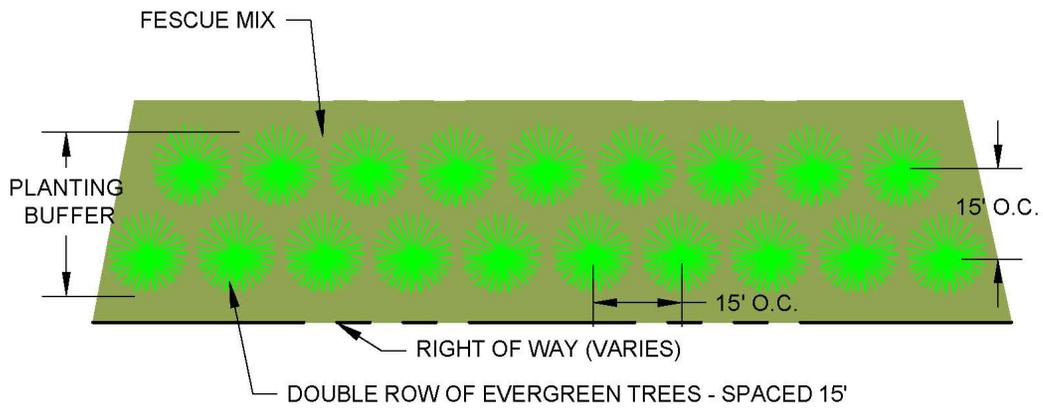
Table 6-1 Module 1 & 2 Trees

Scientific Name	Common Name
Trees	
<i>Juniperus virginiana</i>	Eastern Cedar
<i>Ilex opaca</i>	American Holly
<i>Pinus virginiana</i>	Virginia Pine



SCREENING PLANTING MODULE 1 - PLAN VIEW
NOT TO SCALE

Figure 6-1 **Module 1 Screening**



SCREENING PLANTING MODULE 2 - PLAN VIEW
NOT TO SCALE

Figure 6-2 **Module 2 Screening**

7 Buffer Visualizations

Figure 7-1 Module 1 Simulation



Figure 7-2 Module 2 Simulation



7.1 Buffer Landscape Maintenance

Maintenance of planted landscape buffers will be conducted as needed following installation and will focus on ensuring survival of planted materials.

7.1.1 Plants

After the initial planting, maintenance of native trees and shrubs will include:

- Guying and maintenance of guying for at least one season for trees to ensure they stay upright during the establishment period;
- Application of mulch around tree rings – mulch should be consistently at a depth of 2-3” to help retain moisture and prevent weed growth;
- Pruning of plants as needed to remove dead limbs or unwanted growth; and
- Watering as needed until final acceptance/warranty period expires.

After the initial maintenance period and 1-year warranty (provided by contractor), the plant material selected should not require ongoing intensive maintenance since the proposed species were selected because they are native to Kentucky. Telesto will replace any plantings that die within the first five years to ensure a minimum of 90% survival. Typically, plant material that has sustained one full growing season has a very high likelihood of continued survival. Telesto will monitor the plantings annually during operations to ensure no significant dieback or loss is occurring. Some dieback is expected, mimicking natural succession, and Telesto will evaluate any areas of concern to make sure the intent of the module prescribed is still being met for any specific area. If significant dieback were to occur, Telesto would evaluate the need for mitigation options to ensure the goals of the landscape plan are still being met.

7.1.2 Fescue Mix

After the initial seeding, fescue requires some maintenance to ensure seed gets established. After the establishment period (5 years) the need for maintenance decreases. After the plantings are established, site maintenance is primarily dictated by the need to control woody growth and grass height, which is limited to 1-2 annual mowing events and spot spraying as needed. Telesto will monitor any areas planted in fescue for the first 5-years to ensure adequate establishment and desired fescue abundance is present and to make sure the goals of the landscape plan are still being met.

7.2 On-site Vegetation Establishment

The vegetation contractor shall be responsible for supplemental seeding, exotic and invasive species control, and any other activity that may contribute to the establishment of the vegetation. The contractor must have supervisors and crew who are experienced with identification of a variety of herbaceous vegetation. All crew members performing chemical applications must be licensed in accordance with state laws pertaining to the specific application being performed. There are several methods or techniques typically utilized to facilitate the establishment of a newly vegetated area. The exact techniques and frequencies used will depend largely on the degree of development of the site, as well as special social and cultural concerns that may arise from specific techniques. Typically after several years of intensive maintenance and more robust growth of desirable species the frequency of the establishment activities will be reduced.

7.2.1 Supplemental Seeding

The need for supplemental seeding can usually be determined by the middle of the first growing season following installation. If the site exists as bare ground or is very sparsely vegetated, seeding should be performed with a no-till rangeland type drill planter.

7.2.2 Mowing

Mowing should be used for site management if an abundance of annual weeds are present which may compromise the success of the planting in the first few years after installation. Species such as Foxtail (*Setaria spp.*) and Ragweed (*Ambrosia spp.*) can be controlled by mowing.

7.2.3 Chemical Applications

Many perennial weed species in uplands, such as teasel (*Dipsacus Fullonum*), canada thistle (*Cirsium arvense*), maretail (*Coryza Canadenis*), poison hemlock (*Conium maculatum*), spotted knapweed (*Centaurea maculosa*), purple loosestrife (*Lythrum salicaria*), and Common Reed (*Phragmites australis*), are best controlled through chemical applications. If left unmanaged, many of these weed species will quickly outcompete the young native species for sunlight, nutrients, and space. Additionally, allelopathic species such as spotted knapweed will actually emit chemicals into the soil that will inhibit the growth of other species.

8 Summary

The proposed modules and maintenance activities outlined in this plan serve as a guideline for the final landscape design to ensure that the installation of plant material will align with the objectives set forth for the Project. It is important that visual mitigation be planned according to adjacent uses, intensity of viewership, viewsheds and overall contextual relationship to the Project. It is also important that the proposed landscape blends into the overall character of the existing habitat by utilizing much of the same native plant materials found onsite. Doing so will create a landscape that will visually soften the infrastructure of the Project where needed while providing ecological benefits by incorporating native and pollinator species.

Telesto Energy Project

APPENDIX

A

SCREENING PLAN

Telesto Energy Project

APPENDIX

B

BIODIVERSITY AND VEGETATION
CHECKLISTS

Form A-1: Landscape Checklist (complete for all sites)

Evaluation date: <u>4/28-5/2/2022</u>		Entity name: <u>Telesio Sider</u>		Evaluator name: <u>W. Cunningham</u>	
Site name: <u>Telesio Sider</u>					
<i>Check all that apply below:</i>					
Adjacent land use (check all that apply):	<input checked="" type="checkbox"/> Cropland	<input checked="" type="checkbox"/> Grazing	<input type="checkbox"/> Developed		
	<input type="checkbox"/> Hay	<input checked="" type="checkbox"/> Natural area	<input checked="" type="checkbox"/> Other: <u>Rural housing</u>		
Adjacent crop type(s):	<input checked="" type="checkbox"/> Grain (corn, sorghum, barley, oats, <u>wheat</u>)		<input checked="" type="checkbox"/> Soybean		
	<input type="checkbox"/> Vegetable, List type (if known): _____		<input type="checkbox"/> List other: _____		
Adjacent natural area type(s):	<input checked="" type="checkbox"/> Deciduous woodland / forest	<input type="checkbox"/> Coniferous forest	<input type="checkbox"/> Diverse grassland		
	<input type="checkbox"/> Non-diverse grassland	<input checked="" type="checkbox"/> Wetland	<input checked="" type="checkbox"/> Riparian		
Adjacent protected areas:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> List type (if known): _____		
Corridors on or adjacent to site:	<input checked="" type="checkbox"/> Waterway / riparian corridor - forested		<input checked="" type="checkbox"/> Waterway / riparian corridor - grassland / herbaceous wetland		
	<input checked="" type="checkbox"/> Woodland / forest	<input type="checkbox"/> Grassland / meadow / ROW	<input type="checkbox"/> Other: _____		
Corridors extend through the site:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			
Known apiaries nearby?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Notes: <u>Almost all former pasture converted to no-till agriculture with corn/soybean rotation and seasonal winter wheat. Forests primarily along drains and waterways or slopes above waterways.</u>					

Form A-2: Forested Area Biodiversity Checklist				
Evaluation date: <u>5/2/2022</u>	Entity name: _____	Evaluator name: <u>W. Cunningham</u>	Habitat ID: <u>TEL-V-01</u>	(e.g., FA1 for Forested Area 1)
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
Habitat continues off-site?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
Check all that apply below:				
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input type="checkbox"/> 21-40%	<input type="checkbox"/> >40%	
Unique landforms:	<input type="checkbox"/> Gorge or ravine	<input type="checkbox"/> Boulder or bedrock outcrops	<input type="checkbox"/> Karst	Other: _____
Habitat structure:	<input type="checkbox"/> Open or semi-open canopy	<input type="checkbox"/> Large openings (e.g., grassland)	<input checked="" type="checkbox"/> Natural tree regeneration	
Groundlayer stratum:	<input type="checkbox"/> Sparse	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Dense	
	<input checked="" type="checkbox"/> Heterogeneous	<input type="checkbox"/> Homogeneous	<input type="checkbox"/> Leaf litter dense	
	<input type="checkbox"/> Leaf litter sparse	<input checked="" type="checkbox"/> Leaf litter moderate		
	<input checked="" type="checkbox"/> Ephemeral flowers	<input checked="" type="checkbox"/> Summer / fall flowers		
Approx. cover from non-native species:	<input checked="" type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input checked="" type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
Shrub / subcanopy tree stratum:	<input checked="" type="checkbox"/> Uniform coverage	OR	<input type="checkbox"/> Patchy coverage	<input checked="" type="checkbox"/> Similar sizes
List dominant shrub species:	<u>Lindera benzoin</u>			OR <input type="checkbox"/> Multiple sizes
Approx. cover from non-native species:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input checked="" type="checkbox"/> Nut-bearing species	<input checked="" type="checkbox"/> Fruit-bearing species	<input type="checkbox"/> Early-flowering species	
Tree stratum:	<input type="checkbox"/> <3 tree species in canopy	<input type="checkbox"/> 3-5 tree species in canopy	<input checked="" type="checkbox"/> 6+ tree species in canopy	
List dominant tree species:	<u>Liriodendron tulipifera</u>	<u>Acer rubrum</u>	<u>Quercus alba</u>	<u>Quercus palustris</u>
Relative abundance of non-native species:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input checked="" type="checkbox"/> Nut-bearing trees	<input checked="" type="checkbox"/> Fruit-bearing trees	<input type="checkbox"/> >30" DBH size class	
	<input checked="" type="checkbox"/> <10" DBH size class	<input checked="" type="checkbox"/> 10-20" DBH size class	<input checked="" type="checkbox"/> 20-30" DBH size class	<input type="checkbox"/> Shelf fungi
	<input checked="" type="checkbox"/> Standing dead / dying trees or snags	<input checked="" type="checkbox"/> Large down logs	<input checked="" type="checkbox"/> Mosses and lichens	
Wetlands within habitat:	<input checked="" type="checkbox"/> Forested / shrub carr	<input checked="" type="checkbox"/> Vernal pools	<input type="checkbox"/> Open (wet meadow, marsh)	Other: _____ (refer to wetland delineation)
Streams within habitat:	<input checked="" type="checkbox"/> Wooded banks	<input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Cobble/gravel	<input type="checkbox"/> Fast water features <input checked="" type="checkbox"/> Slow water features
Nesting / roosting habitat:	<input type="checkbox"/> Hollowed / internally decaying trees	<input type="checkbox"/> Twig nests	<input type="checkbox"/> Nesting in hollows / snags	<input type="checkbox"/> Deeply furrowed bark <input checked="" type="checkbox"/> Woodpecker foraging
List known larval host plants:	<u>see meander list</u>			
List wildlife observations / signs of use:				
Birds	Mammals	Insect Groups	Insects	
<u>REVI, KEWA, RBWD, HOWA, GRCA, TUTI, AMGO, INBU, FISP, YBCH, NOPA, SCTA, AMFE, WOTH, GCFL, CACH, AMCR, NOCA, SUTA, BHCO, RBGR, EATO, BGGN, ACFL, EAWP</u>		<input type="checkbox"/> Butterflies / moths (Lepidoptera) <input type="checkbox"/> Native bees <input type="checkbox"/> Bumble bees (<i>Bombus</i> spp.) <input type="checkbox"/> Honey bees (<i>Apis mellifera</i>) <input type="checkbox"/> Wasps <input checked="" type="checkbox"/> Ants <input checked="" type="checkbox"/> True flies (Diptera) <input type="checkbox"/> True bugs (Hemiptera) <input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera) <input type="checkbox"/> Beetles (Coleoptera) <input type="checkbox"/> Insect larvae		
	Herptiles			
Evidence of management:	<input type="checkbox"/> Fencing / grazing	<input checked="" type="checkbox"/> Selective logging	<input type="checkbox"/> List other: _____	
Evidence of disturbance:	<input type="checkbox"/> Fire scars	<input type="checkbox"/> Ice / snow damage	<input type="checkbox"/> Erosion	<input type="checkbox"/> Bare soils
Notes:				

Form A-2: Forested Area Biodiversity Checklist				
Evaluation date: <u>5/2/2022</u>	Entity name: _____	Evaluator name: <u>W. Cunningham</u>	Habitat ID: <u>TEL-V-02</u>	(e.g., FA1 for Forested Area 1)
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
Habitat continues off-site?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
Check all that apply below:				
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input type="checkbox"/> 21-40%	<input type="checkbox"/> >40%	
Unique landforms:	<input type="checkbox"/> Gorge or ravine	<input type="checkbox"/> Boulder or bedrock outcrops	<input type="checkbox"/> Karst	Other: _____
Habitat structure:	<input type="checkbox"/> Open or semi-open canopy	<input type="checkbox"/> Large openings (e.g., grassland)	<input checked="" type="checkbox"/> Natural tree regeneration	
Groundlayer stratum:	<input type="checkbox"/> Sparse	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Dense	
	<input checked="" type="checkbox"/> Heterogeneous	<input type="checkbox"/> Homogeneous		
	<input type="checkbox"/> Leaf litter sparse	<input checked="" type="checkbox"/> Leaf litter moderate	<input type="checkbox"/> Leaf litter dense	
	<input checked="" type="checkbox"/> Ephemeral flowers	<input type="checkbox"/> Summer / fall flowers		
Approx. cover from non-native species:	<input checked="" type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25% <u>Microstegium</u>	<input checked="" type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
Shrub / subcanopy tree stratum:	<input type="checkbox"/> Uniform coverage	OR	<input checked="" type="checkbox"/> Patchy coverage	<input checked="" type="checkbox"/> Similar sizes
List dominant shrub species:	<u>Lindera benzoin</u>		<u>Symphoricarpos orbiculatus</u>	OR
Approx. cover from non-native species:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input type="checkbox"/> Nut-bearing species	<input checked="" type="checkbox"/> Fruit-bearing species	<input type="checkbox"/> Early-flowering species	
Tree stratum:	<input type="checkbox"/> <3 tree species in canopy	<input checked="" type="checkbox"/> 3-5 tree species in canopy	<input checked="" type="checkbox"/> 6+ tree species in canopy	
List dominant tree species:	<u>Liriodendron tulipifera</u>	<u>Acer saccharum</u>	<u>Carya tomentosa</u>	
Relative abundance of non-native species:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input checked="" type="checkbox"/> Nut-bearing trees	<input type="checkbox"/> Fruit-bearing trees		
	<input checked="" type="checkbox"/> <10" DBH size class	<input checked="" type="checkbox"/> 10-20" DBH size class	<input checked="" type="checkbox"/> 20-30" DBH size class	<input type="checkbox"/> >30" DBH size class
	<input type="checkbox"/> Standing dead / dying trees or snags	<input type="checkbox"/> Large down logs	<input checked="" type="checkbox"/> Mosses and lichens	<input type="checkbox"/> Shelf fungi
Wetlands within habitat:	<input type="checkbox"/> Forested / shrub carr	<input type="checkbox"/> Vernal pools	<input type="checkbox"/> Open (wet meadow, marsh)	Other: _____ (refer to wetland delineation)
Streams within habitat:	<input checked="" type="checkbox"/> Wooded banks	<input checked="" type="checkbox"/> Woody debris	<input checked="" type="checkbox"/> Cobble/gravel	<input checked="" type="checkbox"/> Fast water features <input type="checkbox"/> Slow water features
Nesting / roosting habitat:	<input type="checkbox"/> Hollowed / internally decaying trees	<input type="checkbox"/> Twig nests	<input type="checkbox"/> Nesting in hollows / snags	<input type="checkbox"/> Deeply furrowed bark <input checked="" type="checkbox"/> Woodpecker foraging
List known larval host plants:	<u>See meander list</u>			
List wildlife observations / signs of use:				
Birds	Mammals	Insect Groups	Insects	
<u>RHOW, FISP, GCFL, YBCH, AMCR, INBU, KEWA, RBGR, NOCA, EAWP, TUTI, FEVI, NOPA, YTVI, YTWA, AMGO, SUTA</u>		<input type="checkbox"/> Butterflies / moths (Lepidoptera) <input checked="" type="checkbox"/> Native bees Bumble bees (<i>Bombus</i> spp.) <input type="checkbox"/> Honey bees (<i>Apis mellifera</i>) <input type="checkbox"/> Wasps <input checked="" type="checkbox"/> Ants <input type="checkbox"/> True flies (Diptera) <input type="checkbox"/> True bugs (Hemiptera) <input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera) <input type="checkbox"/> Beetles (Coleoptera) <input type="checkbox"/> Insect larvae	<u>Several Bombus</u> <u>Lots of ants</u>	
	Herptiles			
Evidence of management:	<input type="checkbox"/> Fencing / grazing	<input checked="" type="checkbox"/> Selective logging	<input type="checkbox"/> List other: _____	
Evidence of disturbance:	<input type="checkbox"/> Fire scars	<input type="checkbox"/> Ice / snow damage	<input type="checkbox"/> Erosion	<input type="checkbox"/> Bare soils
Notes:				

Form A-2: Forested Area Biodiversity Checklist			
Evaluation date: <u>5/2/2022</u>	Entity name: _____	Evaluator name: <u>W. Cunningham</u>	Habitat ID: <u>TEL-V-04</u> (e.g., FA1 for Forested Area 1)
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Habitat continues off-site?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Check all that apply below:			
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input type="checkbox"/> 21-40%	<input type="checkbox"/> >40%
Unique landforms:	<input type="checkbox"/> Gorge or ravine	<input type="checkbox"/> Boulder or bedrock outcrops	<input type="checkbox"/> Karst Other: _____
Habitat structure:	<input checked="" type="checkbox"/> Open or semi-open canopy	<input type="checkbox"/> Large openings (e.g., grassland)	<input checked="" type="checkbox"/> Natural tree regeneration
Groundlayer stratum:	<input type="checkbox"/> Sparse	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Dense
	<input checked="" type="checkbox"/> Heterogeneous	<input type="checkbox"/> Homogeneous	
	<input checked="" type="checkbox"/> Leaf litter sparse	<input type="checkbox"/> Leaf litter moderate	<input type="checkbox"/> Leaf litter dense
	<input type="checkbox"/> Ephemeral flowers	<input type="checkbox"/> Summer / fall flowers	
Approx. cover from non-native species:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input checked="" type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
Shrub / subcanopy tree stratum:	<input checked="" type="checkbox"/> Uniform coverage	OR <input type="checkbox"/> Patchy coverage	<input checked="" type="checkbox"/> Similar sizes
List dominant shrub species:	<u>Bambus argutus</u>	OR <u>Cephalanthus occidentalis</u>	<input type="checkbox"/> Multiple sizes
Approx. cover from non-native species:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input type="checkbox"/> Nut-bearing species	<input checked="" type="checkbox"/> Fruit-bearing species	<input type="checkbox"/> Early-flowering species
Tree stratum:	<input type="checkbox"/> <3 tree species in canopy	<input checked="" type="checkbox"/> 3-5 tree species in canopy	<input type="checkbox"/> 6+ tree species in canopy
List dominant tree species:	<u>Salix nigra</u>	<u>Betula nigra</u>	<u>Acer rubrum</u>
Relative abundance of non-native species:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input type="checkbox"/> Nut-bearing trees	<input type="checkbox"/> Fruit-bearing trees	<input type="checkbox"/> 20-30" DBH size class
	<input checked="" type="checkbox"/> <10" DBH size class	<input type="checkbox"/> 10-20" DBH size class	<input type="checkbox"/> >30" DBH size class
	<input type="checkbox"/> Standing dead / dying trees or snags	<input type="checkbox"/> Large down logs	<input type="checkbox"/> Mosses and lichens
Wetlands within habitat:	<input checked="" type="checkbox"/> Forested / shrub carr	<input type="checkbox"/> Vernal pools	<input checked="" type="checkbox"/> Open (wet meadow, marsh) Other: _____ (refer to wetland delineation)
Streams within habitat:	<input type="checkbox"/> Wooded banks	<input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Cobble/gravel <input type="checkbox"/> Fast water features <input type="checkbox"/> Slow water features
Nesting / roosting habitat:	<input type="checkbox"/> Hollowed / internally decaying trees	<input type="checkbox"/> Twig nests	<input type="checkbox"/> Nesting in hollows / snags <input type="checkbox"/> Deeply furrowed bark <input type="checkbox"/> Woodpecker foraging
List known larval host plants:	<u>See meander list</u>		
List wildlife observations / signs of use:			
Birds	Mammals	Insect Groups	Insects
<u>GRCA, NOCA, INBU, TUTI, WEVI, EAKI, YEWA, RBGR (F-vigors), YBCH, GCFL, MODO, NOPA, COYE, EAWP, FISP</u>		<input checked="" type="checkbox"/> Butterflies / moths (Lepidoptera)	<u>Several Bambus (at least 2 species)</u> <u>Silver-spotted Skipper (2)</u>
		<input checked="" type="checkbox"/> Native bees	
		<input type="checkbox"/> Bumble bees (<i>Bombus</i> spp.)	
		<input type="checkbox"/> Honey bees (<i>Apis mellifera</i>)	
		<input type="checkbox"/> Wasps	
		<input type="checkbox"/> Ants	
		<input checked="" type="checkbox"/> True flies (Diptera)	
		<input type="checkbox"/> True bugs (Hemiptera)	
		<input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera)	
		<input type="checkbox"/> Beetles (Coleoptera)	
		<input type="checkbox"/> Insect larvae	
Evidence of management:	<input type="checkbox"/> Fencing / grazing	<input type="checkbox"/> Selective logging	<input checked="" type="checkbox"/> List other: <u>bush-hogged until ~ 3 years ago</u>
Evidence of disturbance:	<input type="checkbox"/> Fire scars	<input type="checkbox"/> Ice / snow damage	<input checked="" type="checkbox"/> <u>Rutting</u> <input type="checkbox"/> Erosion <input type="checkbox"/> Bare soils
Notes:			

Form A-2: Forested Area Biodiversity Checklist			
Evaluation date: <u>5/2/2022</u>	Entity name: _____	Evaluator name: <u>W. Cunningham</u>	Habitat ID: <u>TEL-V-05</u> (e.g., FA1 for Forested Area 1)
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Habitat continues off-site?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Check all that apply below:			
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input type="checkbox"/> 21-40%	<input type="checkbox"/> >40%
Unique landforms:	<input type="checkbox"/> Gorge or ravine	<input type="checkbox"/> Boulder or bedrock outcrops	<input type="checkbox"/> Karst
Habitat structure:	<input type="checkbox"/> Open or semi-open canopy	<input type="checkbox"/> Large openings (e.g., grassland)	<input checked="" type="checkbox"/> Natural tree regeneration
Groundlayer stratum:	<input type="checkbox"/> Sparse	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Dense
	<input checked="" type="checkbox"/> Heterogeneous	<input type="checkbox"/> Homogeneous	
	<input type="checkbox"/> Leaf litter sparse	<input checked="" type="checkbox"/> Leaf litter moderate	<input type="checkbox"/> Leaf litter dense
	<input type="checkbox"/> Ephemeral flowers	<input type="checkbox"/> Summer / fall flowers	
Approx. cover from non-native species:	<input type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
Shrub / subcanopy tree stratum:	<input type="checkbox"/> Uniform coverage	<input checked="" type="checkbox"/> Patchy coverage	<input checked="" type="checkbox"/> Similar sizes
List dominant shrub species:	<u>Ligularia barzoin</u>		
Approx. cover from non-native species:	<input type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input type="checkbox"/> Nut-bearing species	<input checked="" type="checkbox"/> Fruit-bearing species	<input type="checkbox"/> Early-flowering species
Tree stratum:	<input checked="" type="checkbox"/> <3 tree species in canopy	<input checked="" type="checkbox"/> 3-5 tree species in canopy	<input type="checkbox"/> 6+ tree species in canopy
List dominant tree species:	<u>Acer rubrum</u>	<u>Quercus palustris</u>	
Relative abundance of non-native species:	<input type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input checked="" type="checkbox"/> Nut-bearing trees	<input checked="" type="checkbox"/> Fruit-bearing trees	
	<input checked="" type="checkbox"/> <10" DBH size class	<input checked="" type="checkbox"/> 10-20" DBH size class	<input type="checkbox"/> 20-30" DBH size class <input type="checkbox"/> >30" DBH size class
	<input checked="" type="checkbox"/> Standing dead / dying trees or snags	<input checked="" type="checkbox"/> Large down logs	<input type="checkbox"/> Mosses and lichens <input type="checkbox"/> Shelf fungi
Wetlands within habitat:	<input checked="" type="checkbox"/> Forested / shrub carr	<input checked="" type="checkbox"/> Vernal pools	<input type="checkbox"/> Other: _____ (refer to wetland delineation)
Streams within habitat:	<input type="checkbox"/> Wooded banks	<input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Cobble/gravel <input type="checkbox"/> Fast water features <input type="checkbox"/> Slow water features
Nesting / roosting habitat:	<input type="checkbox"/> Hollowed / internally decaying trees	<input type="checkbox"/> Twig nests	<input type="checkbox"/> Nesting in hollows / snags <input type="checkbox"/> Deeply furrowed bark <input checked="" type="checkbox"/> Woodpecker foraging
List known larval host plants:	<u>see meander list</u>		
List wildlife observations / signs of use:			
Birds	Mammals	Insect Groups	Insects
<u>COYE, SOSP, NOCA, RWBL, AMCR, DOWO, TUTI</u>		<input type="checkbox"/> Butterflies / moths (Lepidoptera)	<u>1 Bumble</u>
		<input checked="" type="checkbox"/> Native bees	
		<input type="checkbox"/> Honey bees (<i>Apis mellifera</i>)	
		<input type="checkbox"/> Wasps	
		<input checked="" type="checkbox"/> Ants	
		<input type="checkbox"/> True flies (Diptera)	
		<input type="checkbox"/> True bugs (Hemiptera)	
		<input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera)	
		<input type="checkbox"/> Beetles (Coleoptera)	
		<input type="checkbox"/> Insect larvae	
Evidence of management:	<input type="checkbox"/> Fencing / grazing	<input type="checkbox"/> Selective logging	<input type="checkbox"/> List other: _____
Evidence of disturbance:	<input type="checkbox"/> Fire scars	<input type="checkbox"/> Ice / snow damage	<input checked="" type="checkbox"/> <u>dozer piles</u> <input type="checkbox"/> Erosion <input type="checkbox"/> Bare soils
Notes:			

TEL-V-06

Form A-2: Forested Area Biodiversity Checklist			
Evaluation date: 4/29/2022	Entity name:	Evaluator name: W. Cunningham	Habitat ID: TEL-V-06 (e.g., FA1 for Forested Area 1)
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Habitat continues off-site?	<input checked="" type="checkbox"/> Yes <i>some</i>	<input type="checkbox"/> No	
Check all that apply below:			
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input checked="" type="checkbox"/> 21-40%	<input type="checkbox"/> >40%
Unique landforms:	<input type="checkbox"/> Gorge or ravine	<input type="checkbox"/> Boulder or bedrock outcrops	<input type="checkbox"/> Karst Other:
Habitat structure:	<input type="checkbox"/> Open or semi-open canopy	<input type="checkbox"/> Large openings (e.g., grassland)	<input type="checkbox"/> Natural tree regeneration
Groundlayer stratum:	<input type="checkbox"/> Sparse	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Dense
	<input checked="" type="checkbox"/> Heterogeneous	<input type="checkbox"/> Homogeneous	
	<input type="checkbox"/> Leaf litter sparse	<input checked="" type="checkbox"/> Leaf litter moderate	<input type="checkbox"/> Leaf litter dense
	<input checked="" type="checkbox"/> Ephemeral flowers	<input checked="" type="checkbox"/> Summer / fall flowers	
Approx. cover from non-native species:	<input checked="" type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
Shrub / subcanopy tree stratum:	<input type="checkbox"/> Uniform coverage OR	<input checked="" type="checkbox"/> Patchy coverage	<input type="checkbox"/> Similar sizes OR <input checked="" type="checkbox"/> Multiple sizes
List dominant shrub species:	<i>Lindera benzoin</i>	<i>Rosa multiflora</i>	<i>Evonymus alata</i>
Approx. cover from non-native species:	<input type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input type="checkbox"/> Nut-bearing species	<input checked="" type="checkbox"/> Fruit-bearing species	<input checked="" type="checkbox"/> Early-flowering species
Tree stratum:	<input type="checkbox"/> <3 tree species in canopy	<input type="checkbox"/> 3-5 tree species in canopy	<input checked="" type="checkbox"/> 6+ tree species in canopy
List dominant tree species:	<i>Acer rubrum</i>	<i>Pinus serotina</i>	<i>Carya glabra</i> <i>Quercus velutina</i>
Relative abundance of non-native species:	<input type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input checked="" type="checkbox"/> Nut-bearing trees	<input checked="" type="checkbox"/> Fruit-bearing trees	
	<input checked="" type="checkbox"/> <10" DBH size class	<input checked="" type="checkbox"/> 10-20" DBH size class	<input checked="" type="checkbox"/> 20-30" DBH size class <input checked="" type="checkbox"/> >30" DBH size class
	<input checked="" type="checkbox"/> Standing dead / dying trees or snags	<input checked="" type="checkbox"/> Large down logs	<input checked="" type="checkbox"/> Mosses and lichens <input type="checkbox"/> Shelf fungi
Wetlands within habitat:	<input checked="" type="checkbox"/> Forested / shrub carr	<input checked="" type="checkbox"/> Vernal pools	<input type="checkbox"/> Other: (refer to wetland delineation)
Streams within habitat:	<input checked="" type="checkbox"/> Wooded banks	<input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Cobble/gravel <input type="checkbox"/> Fast water features <input checked="" type="checkbox"/> Slow water features
Nesting / roosting habitat:	<input checked="" type="checkbox"/> Hollowed / internally decaying trees	<input type="checkbox"/> Twig nests	<input checked="" type="checkbox"/> Nesting in hollows / snags <input type="checkbox"/> Deeply furrowed bark <input checked="" type="checkbox"/> Woodpecker foraging
List known larval host plants:	<i>see meander data</i>		
List wildlife observations / signs of use:			
Birds	Mammals	Insect Groups	Insects
YTVI, RBWD, B66N, BTNW, GCFL, NOCA, BHCO, HOWR, WBNU, REVI, INBU, TUTI, YEWA, BLJA, EATO, WEVI, COYE, AMRO, AMGO, CACH, SUTA, YBCH, AMCR		<input type="checkbox"/> Butterflies / moths (Lepidoptera) <input checked="" type="checkbox"/> Native bees <input type="checkbox"/> Bumble bees (<i>Bombus</i> spp.) <input type="checkbox"/> Honey bees (<i>Apis mellifera</i>) <input type="checkbox"/> Wasps <input type="checkbox"/> Ants <input type="checkbox"/> True flies (Diptera) <input type="checkbox"/> True bugs (Hemiptera) <input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera) <input type="checkbox"/> Beetles (Coleoptera) <input type="checkbox"/> Insect larvae	1 <i>Xylocopa</i>
	Herptiles		
Evidence of management:	<input checked="" type="checkbox"/> Fencing / grazing <i>old</i>	<input type="checkbox"/> Selective logging	<input type="checkbox"/> List other:
Evidence of disturbance:	<input type="checkbox"/> Fire scars	<input type="checkbox"/> Ice / snow damage	<input type="checkbox"/> Erosion <input type="checkbox"/> Bare soils
Notes:	<i>*Acer rubrum only proper dominant canopy species. Quercus velutina large but scattered</i>		

Form A-3: Grassland Area Biodiversity Checklist (for Meadows, Old Fields, Shrublands, and Prairie)					
Evaluation date: <u>4/29/2022</u>		Entity name: _____		Evaluator name: <u>W. Cunningham</u> Habitat ID: <u>TEL-V-10</u> (e.g., GA1 for Grassland Area 1)	
Meander vegetation survey completed?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Habitat continues off-site?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Check all that apply below:					
Slopes:		<input checked="" type="checkbox"/> 0-20% <input type="checkbox"/> 21-40% <input type="checkbox"/> >40%			
Landforms:		<input type="checkbox"/> Plains (flat, low relief) <input checked="" type="checkbox"/> Rolling hills <input type="checkbox"/> Valley <input type="checkbox"/> Tableland <input type="checkbox"/> Other: _____			
Predominant structure:		<input type="checkbox"/> Short grasses (most <1 ft) <input checked="" type="checkbox"/> Mixed grasses <input type="checkbox"/> Tall grasses (up to >6+ ft)			
Structural layers:		<input checked="" type="checkbox"/> Tall grass / forb layer <input checked="" type="checkbox"/> Mid grass / forb layer <input type="checkbox"/> Ground cover (low growing plants, mosses, lichens)			
Soil texture:		<input type="checkbox"/> Coarse-textured (gravel, sand) <input checked="" type="checkbox"/> Fine textured (silt, clay)			
Soil drainage class:		<input type="checkbox"/> Dry (excessively well-drained) <input checked="" type="checkbox"/> Mesic (well-drained) <input checked="" type="checkbox"/> Wet (poorly drained)			
Groundlayer stratum:		<input type="checkbox"/> Native cool season grasses <input type="checkbox"/> Approx. % cover: _____ <input checked="" type="checkbox"/> Native warm season grasses <input checked="" type="checkbox"/> Approx. % cover: <u>9%</u> <input checked="" type="checkbox"/> Total native cover: <u>89%</u>			
List dominant herbaceous species:		<input type="checkbox"/> Non-native cool season grasses <input type="checkbox"/> Approx. % cover: _____ <input type="checkbox"/> Non-native warm season grasses <input type="checkbox"/> Approx. % cover: _____ <input checked="" type="checkbox"/> Total non-native cover: <u>10%</u>			
Relative abundance of non-native species:		<input checked="" type="checkbox"/> 0-5% <input checked="" type="checkbox"/> 6-25% <input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+			
Potentially flowering native cover:		<input type="checkbox"/> 0-5% <input type="checkbox"/> 6-25% <input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+			
Potentially flowering non-native cover:		<input checked="" type="checkbox"/> 0-5% <input type="checkbox"/> 6-25% <input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+			
Shrub stratum (if present):		<input checked="" type="checkbox"/> <30% overall cover <input type="checkbox"/> >30% overall cover			
Uniform coverage OR Patchy coverage		<input type="checkbox"/> Uniform coverage <input checked="" type="checkbox"/> Patchy coverage			
Nut-bearing shrubs		<input type="checkbox"/> Nut-bearing shrubs <input checked="" type="checkbox"/> Fruit-bearing shrubs			
Approx. cover from non-native species:		<input type="checkbox"/> 0-5% <input checked="" type="checkbox"/> 6-25% <input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+			
Wetlands within habitat:		<input type="checkbox"/> Forested / shrub <input checked="" type="checkbox"/> Open (wet meadow, marsh, etc.) <input checked="" type="checkbox"/> Other: <u>pond</u> (refer to wetland delineation report)			
Streams within habitat:		<input type="checkbox"/> Wooded banks <input type="checkbox"/> Woody debris <input type="checkbox"/> Cobble/gravel <input type="checkbox"/> Fast water features <input type="checkbox"/> Slow water features			
Litter characteristics:		<input type="checkbox"/> Uniform <input type="checkbox"/> Somewhat patchy <input checked="" type="checkbox"/> Absence or in small patches			
Habitat features:		<input checked="" type="checkbox"/> Thin <input type="checkbox"/> Moderate <input type="checkbox"/> Thick <input type="checkbox"/> Bare ground patches <input type="checkbox"/> Dead wood or snags <input type="checkbox"/> Plants with hollow pithy stems			
List known larval host plants:		<u>See meander list</u>			
List wildlife observations / signs of use:					
Birds		Mammals		Insect Groups	
AMRO, EATO, BRTH, NOBO, GRHE, RWBL, COYE, NOCA, GRCA, YENA, SOSP		1 Marmot		<input checked="" type="checkbox"/> Butterflies / moths (Lepidoptera) <input checked="" type="checkbox"/> Native bees <input checked="" type="checkbox"/> Bumble bees (Bombus spp.) <input checked="" type="checkbox"/> Honey bees (Apis mellifera) <input checked="" type="checkbox"/> Wasps <input type="checkbox"/> Ants <input checked="" type="checkbox"/> True flies (Diptera) <input checked="" type="checkbox"/> True bugs (Hemiptera) <input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera) <input type="checkbox"/> Beetles (Coleoptera) <input type="checkbox"/> Insect larvae	
		Herptiles		Insects	
		Basking turtles Green Frogs 1 Neurodia		2 Xylocopa bees 1 Apis bee 1 Vespula (red) 1 Assassin bug 1 Praying mantis casing 1 Silver spot Skipper 1 Azure butterfly 10s of Tipulidae (adult) 10s of Chironomidae (adult)	
Evidence of management:		<input type="checkbox"/> Fencing / grazing <input checked="" type="checkbox"/> Haying <input type="checkbox"/> Roads / trails <input checked="" type="checkbox"/> List other: <u>herbicide</u>			
Evidence of disturbance:		<input type="checkbox"/> Fire scars <input type="checkbox"/> Burrowing <input type="checkbox"/> Erosion <input checked="" type="checkbox"/> Bare soils			
Notes:					

Form A-2: Forested Area Biodiversity Checklist			
Evaluation date: <u>4/29/2022</u>	Entity name: _____	Evaluator name: <u>W. Cunningham</u>	Habitat ID: <u>TEL-V-11</u> (e.g., FA1 for Forested Area 1)
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Habitat continues off-site?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Check all that apply below:			
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input checked="" type="checkbox"/> 21-40%	<input type="checkbox"/> >40%
Unique landforms:	<input type="checkbox"/> Gorge or ravine	<input type="checkbox"/> Boulder or bedrock outcrops	<input type="checkbox"/> Karst
Habitat structure:	<input checked="" type="checkbox"/> Open or semi-open canopy	<input type="checkbox"/> Large openings (e.g., grassland)	<input checked="" type="checkbox"/> Natural tree regeneration
Groundlayer stratum:	<input type="checkbox"/> Sparse	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> Dense
	<input checked="" type="checkbox"/> Heterogeneous	<input checked="" type="checkbox"/> Homogeneous <u>in places</u>	<input type="checkbox"/> Leaf litter dense
	<input type="checkbox"/> Leaf litter sparse	<input checked="" type="checkbox"/> Leaf litter moderate	
	<input type="checkbox"/> Ephemeral flowers	<input type="checkbox"/> Summer / fall flowers	
Approx. cover from non-native species:	<input type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input checked="" type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
Shrub / subcanopy tree stratum:	<input checked="" type="checkbox"/> Uniform coverage	<input type="checkbox"/> Patchy coverage	<input checked="" type="checkbox"/> Similar sizes
List dominant shrub species:	<u>Lindera benzoin</u>	<u>Rosa multiflora</u>	<u>Symphoricarpos orbiculatus</u>
Approx. cover from non-native species:	<input type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input type="checkbox"/> Nut-bearing species	<input checked="" type="checkbox"/> Fruit-bearing species	<input checked="" type="checkbox"/> Early-flowering species
Tree stratum:	<input type="checkbox"/> <3 tree species in canopy	<input checked="" type="checkbox"/> 3-5 tree species in canopy	<input type="checkbox"/> 6+ tree species in canopy
List dominant tree species:	<u>Acer rubrum</u>	<u>Prunus serotina</u>	<u>Juniperus virginiana</u>
Relative abundance of non-native species:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50% <input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
	<input type="checkbox"/> Nut-bearing trees	<input checked="" type="checkbox"/> Fruit-bearing trees	
	<input checked="" type="checkbox"/> <10" DBH size class	<input checked="" type="checkbox"/> 10-20" DBH size class	<input type="checkbox"/> 20-30" DBH size class
	<input checked="" type="checkbox"/> Standing dead / dying trees or snags	<input type="checkbox"/> Large down logs	<input type="checkbox"/> Mosses and lichens
Wetlands within habitat:	<input checked="" type="checkbox"/> Forested / shrub carr	<input type="checkbox"/> Vernal pools	<input type="checkbox"/> Open (wet meadow, marsh)
Streams within habitat:	<input checked="" type="checkbox"/> Wooded banks	<input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Cobble/gravel
Nesting / roosting habitat:	<input type="checkbox"/> Hollowed / internally decaying trees	<input type="checkbox"/> Twig nests	<input type="checkbox"/> Nesting in hollows / snags
List known larval host plants:	<u>see meander list</u>		
List wildlife observations / signs of use:			
Birds	Mammals	Insect Groups	Insects
<u>AMPE, AMPO, SOSF, NOMO, NOCA, BLJA, RBWD, INBU, REVI, TUTI, YEWA, HOWR, VEER*, FISP, CARW, SUTA</u>	<u>2 Gray Squirrel</u>	<input checked="" type="checkbox"/> Butterflies / moths (Lepidoptera) <input checked="" type="checkbox"/> Native bees <input type="checkbox"/> Bumble bees (<i>Bombus</i> spp.) <input type="checkbox"/> Honey bees (<i>Apis mellifera</i>) <input checked="" type="checkbox"/> Wasps <input checked="" type="checkbox"/> Ants <input checked="" type="checkbox"/> True flies (Diptera) <input checked="" type="checkbox"/> True bugs (Hemiptera) <input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera) <input type="checkbox"/> Beetles (Coleoptera) <input type="checkbox"/> Insect larvae	<u>1 small white moth</u> <u>1 parasitic wasp</u> <u>1 Brown Marmorated Stink Bug</u> <u>3 small black/yellow predatory wasps</u> <u>1 Sarcophaga? fly</u> <u>1 Bombus</u>
Evidence of management:	<input checked="" type="checkbox"/> Fencing / grazing	<input checked="" type="checkbox"/> Selective logging	<input type="checkbox"/> List other: _____
Evidence of disturbance:	<input type="checkbox"/> Fire scars	<input type="checkbox"/> Ice / snow damage	<input type="checkbox"/> Erosion <input checked="" type="checkbox"/> Bare soils
Notes:			
<u>* Migrant Veery singing & visual</u>			
<u>Tractor clearing of trail for horseback riding</u>			

Form A-4: Agricultural Area Checklist				
Evaluation date: <u>4/29/2020</u>		Entity name: _____		Evaluator name: <u>W. Cunningham</u> Habitat ID: <u>TEL-V-12</u> (e.g., AA1 for Agricultural Area 1)
Check all that apply below:				
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input checked="" type="checkbox"/> 21-40%	<input type="checkbox"/> >40%	
Landforms:	<input type="checkbox"/> Plains (flat, low relief)	<input checked="" type="checkbox"/> Rolling hills	<input type="checkbox"/> Valley	<input type="checkbox"/> Tableland <input type="checkbox"/> Other: _____
Crop type(s):	<input checked="" type="checkbox"/> Grain Approx. % of area: <u>100%</u>	<input type="checkbox"/> Soybean Approx. % of area: _____	<input type="checkbox"/> Vegetable / herb / fruit, list type: _____ Approx. % of area: _____	
Grazing:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Grazing animal(s) (if known): _____	
Soil texture:	<input type="checkbox"/> Coarse-textured (gravel, sand)	<input checked="" type="checkbox"/> Fine textured (silt, clay)		
Soil drainage class:	<input type="checkbox"/> Dry (excessively well-drained)	<input checked="" type="checkbox"/> Mesic (well-drained)	<input type="checkbox"/> Wet (poorly drained)	
Soil visual indicators:	<input type="checkbox"/> Splash pedestals 1 2 3	<input type="checkbox"/> Rills 1 2 3	<input type="checkbox"/> Sheetwash 1 2 3	<input type="checkbox"/> Sedimentation 1 2 3
	<input type="checkbox"/> Stoniness 1 2 3	<input type="checkbox"/> Exposed subsoil 1 2 3	<input type="checkbox"/> Gullies 1 2 3	<input type="checkbox"/> Loose soils 1 2 3
Assign a value (circle above) for each indicator that is present: 1 - Infrequent, localized; 2 - Common, widespread; 3 - Numerous				
Soil fertility samples collected?	<input checked="" type="checkbox"/> Yes <u>nearby</u>	<input type="checkbox"/> No		
Soil health samples collected?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No		
Soil carbon samples collected?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No		
Field edges:	<input type="checkbox"/> Milkweed	<input type="checkbox"/> Pollinator nectar plants	<input type="checkbox"/> Vegetated strips / buffers	<input type="checkbox"/> Adjacent natural area <input checked="" type="checkbox"/> Soft / feathered edges <u>some fence row</u>
Field interior:	<input type="checkbox"/> Milkweed	<input type="checkbox"/> Pollinator nectar plants	<input type="checkbox"/> Vegetative strips / filter strips	<input type="checkbox"/> Grassed swales <input type="checkbox"/> Solitary tree(s)
Internal windbreak / fencerow: <u>NO</u>	Approx. width (feet): _____	<input type="checkbox"/> Contiguous across site	<input type="checkbox"/> Broken or gaps	<input type="checkbox"/> Connected to off-site natural area
	<input type="checkbox"/> Tree / shrub-dominant	<input type="checkbox"/> Herbaceous-dominant		
	Approx. average tree height (feet): _____	<input type="checkbox"/> Canopy intermediate to closed		<input type="checkbox"/> Canopy open to intermediate
List dominant tree / shrub species:	_____			
List dominant herbaceous species:	_____			
Potentially flowering native cover:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input type="checkbox"/> 75%+
Potentially flowering non-native cover:	<input type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input checked="" type="checkbox"/> 75%+
Relative abundance of non-native species:	<input type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75% <input checked="" type="checkbox"/> 75%+
Habitat features:	<input type="checkbox"/> Dead wood or snags	<input type="checkbox"/> Boulders or rock piles	<input type="checkbox"/> Plants with hollow pithy stems	<input type="checkbox"/> Brush piles
Evidence of management:	<input type="checkbox"/> Burn scars	<input type="checkbox"/> Selective logging	<input type="checkbox"/> Tree / shrub planting	<input checked="" type="checkbox"/> Herbicide
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
List known larval host plants:	<u>See meander list</u>			
Wetlands within habitat: <u>NO</u>	<input type="checkbox"/> Farmed	<input type="checkbox"/> Forested / shrub	<input type="checkbox"/> Open (wet meadow, marsh, etc.)	<input type="checkbox"/> Other: _____ (refer to wetland delineation report)
Streams within habitat: <u>NO</u>	<input type="checkbox"/> Wooded banks	<input type="checkbox"/> Woody debris	<input type="checkbox"/> Cobble/gravel	<input type="checkbox"/> Fast water features <input type="checkbox"/> Slow water features
List wildlife observations / signs of use:				
Birds	Mammals	Insect Groups	Insects	
<u>RWBL, SOFP, EAME</u>		<input checked="" type="checkbox"/> Butterflies / moths (Lepidoptera)	<u>1 small white moth</u>	
		<input type="checkbox"/> Native bees		
		<input type="checkbox"/> Bumble bees (<i>Bombus</i> spp.)		
		<input type="checkbox"/> Honey bees (<i>Apis mellifera</i>)		
		<input type="checkbox"/> Wasps		
		<input type="checkbox"/> Ants		
		<input type="checkbox"/> True flies (Diptera)		
		<input type="checkbox"/> True bugs (Hemiptera)		
		<input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera)		
		<input type="checkbox"/> Beetles (Coleoptera)		
		<input type="checkbox"/> Insect larvae		
Notes:				

Form A-4: Agricultural Area Checklist			
Evaluation date: <u>4/28/2022</u>	Entity name: _____	Evaluator name: <u>W. Cunningham</u>	Habitat ID: <u>TEL-V-14</u> (e.g., AA1 for Agricultural Area 1)
Check all that apply below:			
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input type="checkbox"/> 21-40%	<input type="checkbox"/> >40%
Landforms:	<input type="checkbox"/> Plains (flat, low relief)	<input checked="" type="checkbox"/> Rolling hills	<input type="checkbox"/> Valley
Crop type(s):	<input checked="" type="checkbox"/> Grain	<input type="checkbox"/> Soybean	<input type="checkbox"/> Vegetable / herb / fruit, list type: _____
	Approx. % of area: <u>790</u>	Approx. % of area: _____	Approx. % of area: _____
Grazing:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Grazing animal(s) (if known): _____
Soil texture:	<input type="checkbox"/> Coarse-textured (gravel, sand)	<input checked="" type="checkbox"/> Fine textured (silt, clay)	
Soil drainage class:	<input type="checkbox"/> Dry (excessively well-drained)	<input checked="" type="checkbox"/> Mesic (well-drained)	<input type="checkbox"/> Wet (poorly drained)
Soil visual indicators:	<input type="checkbox"/> Splash pedestals 1 2 3	<input checked="" type="checkbox"/> Rills 1 2 3	<input type="checkbox"/> Sheetwash 1 2 3
	<input type="checkbox"/> Stoniness 1 2 3	<input type="checkbox"/> Exposed subsoil 1 2 3	<input type="checkbox"/> Gullies 1 2 3
Assign a value (circle above) for each indicator that is present: 1 - Infrequent, localized; 2 - Common, widespread; 3 - Numerous			
Soil fertility samples collected?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Soil health samples collected?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Soil carbon samples collected?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Field edges:	<input type="checkbox"/> Milkweed	<input type="checkbox"/> Pollinator nectar plants	<input type="checkbox"/> Vegetated strips / buffers
Field interior:	<input type="checkbox"/> Milkweed	<input type="checkbox"/> Pollinator nectar plants	<input type="checkbox"/> Vegetative strips / filter strips
Internal windbreak / fencerow:	Approx. width (feet): <u>20</u>	<input type="checkbox"/> Contiguous across site	<input type="checkbox"/> Broken or gaps
	<input checked="" type="checkbox"/> Tree / shrub-dominant	<input type="checkbox"/> Herbaceous-dominant	<input type="checkbox"/> Connected to off-site natural area
List dominant tree / shrub species:	Approx. average tree height (feet): <u>25</u>	<input checked="" type="checkbox"/> Canopy intermediate to closed	<input type="checkbox"/> Canopy open to intermediate
	<input type="checkbox"/> Nut-bearing species	<input type="checkbox"/> Fruit-bearing species	<input type="checkbox"/> Early-flowering species
List dominant herbaceous species:	<u>Platanus occidentalis</u>	<u>Acer saccharum</u>	<u>Acer negundo</u>
Potentially flowering native cover:	<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%
Potentially flowering non-native cover:	<input type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%
Relative abundance of non-native species:	<input type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%
Habitat features:	<input type="checkbox"/> Dead wood or snags	<input type="checkbox"/> Boulders or rock piles	<input type="checkbox"/> Plants with hollow pithy stems
Evidence of management:	<input type="checkbox"/> Burn scars	<input type="checkbox"/> Selective logging	<input type="checkbox"/> Tree / shrub planting
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Herbicide
List known larval host plants:	<u>see meander data - FEW</u>		
Wetlands within habitat:	<input type="checkbox"/> Farmed	<input type="checkbox"/> Forested / shrub	<input type="checkbox"/> Open (wet meadow, marsh, etc.)
Streams within habitat:	<input checked="" type="checkbox"/> Wooded banks	<input type="checkbox"/> Woody debris	<input type="checkbox"/> Cobble/gravel
List wildlife observations / signs of use:			
Birds	Mammals	Insect Groups	Insects
<u>TUTI, RWBL, COYE, AMGO, BLJA, SOSP, RBWO, NOCA, INBU, EATD, NOBO, - all in fencerows</u> <u>Howl in distance</u>		<input type="checkbox"/> Butterflies / moths (Lepidoptera) <input type="checkbox"/> Native bees <input type="checkbox"/> Bumble bees (<i>Bombus</i> spp.) <input type="checkbox"/> Honey bees (<i>Apis mellifera</i>) <input type="checkbox"/> Wasps <input type="checkbox"/> Ants <input checked="" type="checkbox"/> True flies (Diptera) <input type="checkbox"/> True bugs (Hemiptera) <input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera) <input type="checkbox"/> Beetles (Coleoptera) <input type="checkbox"/> Insect larvae	<u>1 Tipulidae</u>
Notes:			

Form A-2: Forested Area Biodiversity Checklist					
Evaluation date: <u>4/28/2022</u>	Entity name: _____	Evaluator name: <u>W. Cunningham</u>	Habitat ID: <u>TEL-V-15</u>	(e.g., FA1 for Forested Area 1)	
Meander vegetation survey completed?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No			
Habitat continues off-site?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
Check all that apply below:					
Slopes:	<input checked="" type="checkbox"/> 0-20%	<input type="checkbox"/> 21-40%	<input type="checkbox"/> >40%		
Unique landforms:	<input type="checkbox"/> Gorge or ravine	<input type="checkbox"/> Boulder or bedrock outcrops	<input type="checkbox"/> Karst	Other: _____	
Habitat structure:	<input type="checkbox"/> Open or semi-open canopy	<input type="checkbox"/> Large openings (e.g., grassland)	<input type="checkbox"/> Natural tree regeneration		
Groundlayer stratum:	<input checked="" type="checkbox"/> Sparse	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Dense		
	<input checked="" type="checkbox"/> Heterogeneous	<input type="checkbox"/> Homogeneous			
	<input type="checkbox"/> Leaf litter sparse	<input checked="" type="checkbox"/> Leaf litter moderate	<input type="checkbox"/> Leaf litter dense		
	<input checked="" type="checkbox"/> Ephemeral flowers	<input checked="" type="checkbox"/> Summer / fall flowers			
Approx. cover from non-native species:	<input type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input checked="" type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75%	<input type="checkbox"/> 75%+
Shrub / subcanopy tree stratum:	<input checked="" type="checkbox"/> Uniform coverage	OR	<input type="checkbox"/> Patchy coverage	<input type="checkbox"/> Similar sizes	OR
List dominant shrub species:	<u>Rosa multiflora</u>		<u>Symphoricarpos orbiculatus</u>	<u>Morus alba</u>	
Approx. cover from non-native species:	<input type="checkbox"/> 0-5%	<input checked="" type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75%	<input type="checkbox"/> 75%+
	<input type="checkbox"/> Nut-bearing species	<input checked="" type="checkbox"/> Fruit-bearing species	Early-flowering species		
Tree stratum:	<input type="checkbox"/> <3 tree species in canopy	<input checked="" type="checkbox"/> 3-5 tree species in canopy	<input type="checkbox"/> 6+ tree species in canopy		
List dominant tree species:	<u>Acer rubrum</u>	<u>Prunus serotina</u>	<u>Robinia pseudoacacia</u>		
Relative abundance of non-native species:	<input type="checkbox"/> 0-5%	<input type="checkbox"/> 6-25%	<input type="checkbox"/> 26-50%	<input type="checkbox"/> 51-75%	<input type="checkbox"/> 75%+
	<input checked="" type="checkbox"/> Nut-bearing trees	<input checked="" type="checkbox"/> Fruit-bearing trees			
	<input checked="" type="checkbox"/> <10" DBH size class	<input type="checkbox"/> 10-20" DBH size class	<input checked="" type="checkbox"/> 20-30" DBH size class 2	<input type="checkbox"/> >30" DBH size class	
	<input type="checkbox"/> Standing dead / dying trees or snags	<input type="checkbox"/> Large down logs	<input checked="" type="checkbox"/> Mosses and lichens	<input type="checkbox"/> Shelf fungi	
Wetlands within habitat:	<input checked="" type="checkbox"/> Forested / shrub carr	<input type="checkbox"/> Vernal pools	<input type="checkbox"/> Open (wet meadow, marsh)	<input checked="" type="checkbox"/> Other: <u>pond</u> (refer to wetland delineation)	
Streams within habitat:	<input type="checkbox"/> Wooded banks	<input checked="" type="checkbox"/> Woody debris	<input type="checkbox"/> Cobble/gravel	<input type="checkbox"/> Fast water features	<input type="checkbox"/> Slow water features
Nesting / roosting habitat:	<input type="checkbox"/> Hollowed / internally decaying trees	<input type="checkbox"/> Twig nests	<input type="checkbox"/> Nesting in hollows / snags	<input type="checkbox"/> Deeply furrowed bark	<input checked="" type="checkbox"/> Woodpecker foraging
List known larval host plants:	<u>see meander data</u>				
List wildlife observations / signs of use:					
Birds		Mammals	Insect Groups	Insects	
AMRO, AMGO, HOWR, COGR, COYE, FISP, EATD, INBU, SOSR, TUTI, NOCA			<input type="checkbox"/> Butterflies / moths (Lepidoptera) <input checked="" type="checkbox"/> Native bees <input type="checkbox"/> Bumble bees (<i>Bombus</i> spp.) <input type="checkbox"/> Honey bees (<i>Apis mellifera</i>) <input type="checkbox"/> Wasps <input type="checkbox"/> Ants <input checked="" type="checkbox"/> True flies (Diptera) <input type="checkbox"/> True bugs (Hemiptera) <input type="checkbox"/> Grasshoppers, crickets, katydids (Orthoptera) <input type="checkbox"/> Beetles (Coleoptera) <input type="checkbox"/> Insect larvae	10s of adult chironomidae Sarcophaga fly? 1 Xylorpa	
		Herpetiles			
		1 Adult Green Frog			
Evidence of management:	<input type="checkbox"/> Fencing / grazing	<input type="checkbox"/> Selective logging	<input checked="" type="checkbox"/> List other: <u>pond dug</u>	<input type="checkbox"/> Erosion	<input type="checkbox"/> Bare soils
Evidence of disturbance:	<input type="checkbox"/> Fire scars	<input type="checkbox"/> Ice / snow damage			
Notes:					

Telesto Energy Project

APPENDIX

C

VISUAL RESOURCE ASSESSMENT

Visual Resource Assessment and Mitigation Plan

Telesto Energy Project

May 2022



Document Information

Prepared for Telesto Energy Project, LLC
Project Name Telesto Energy Project
 Visual Resource Assessment
Project Number E320201803
Project Manager Chad Martin
Date May 2022

Prepared for:

Telesto Energy Project, LLC
501 Westlake Park Blvd, Houston, Texas 77079

Prepared by:



Cardno
76 San Marcos Street, Austin, TX 78702

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Acronyms

AC	Alternating Current
DC	Direct Current
DSM	Digital Surface Model
GPS	Global Positioning System
LT	Landscape Type
MW	Megawatt
NHL	National Historic Landmarks
NLCD	National Land Cover Database
NRHP	National Register of Historic Places
PV	Photovoltaic
SRHP	State Register of Historic Places
VRA	Visual Resource Assessment
VSA	Visual Study Area
VSR	Visually Sensitive Resource

1 Introduction

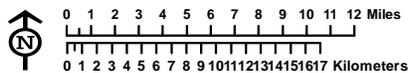
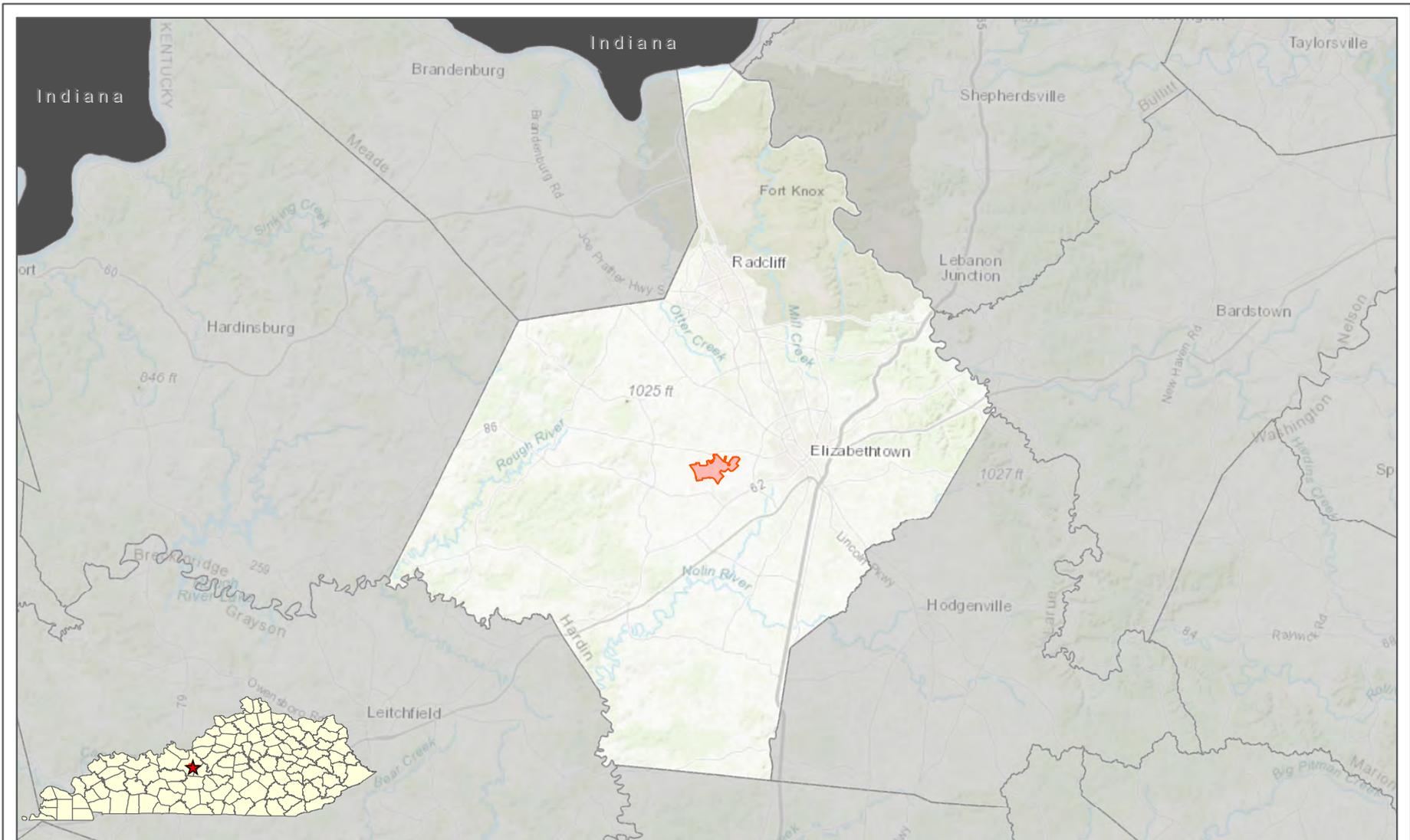
1.1 Purpose of the Investigation

At the request of Telesto Energy Project, LLC (Telesto), Cardno now Stantec (Cardno) has prepared this Visual Resource Assessment (VRA) in support of the Telesto Energy Project (Project) near Elizabethtown Kentucky, located approximately 40 miles south of Louisville in Hardin County, Kentucky (Figure 1-1).

This study has been conducted to identify and assess the Visually Sensitive Resources (VSRs), project visibility, and potential visual impacts resulting from construction of the proposed solar-powered electric generation facility.

The VRA includes the following:

- > Description of the visible components of the proposed Project;
- > Definition of the visual character of the Visual Study Area (VSA);
- > Inventory and evaluation of the existing Visually Sensitive Resources (VSRs) within the VSA;
- > Evaluation of the potential visibility of the Project within the VSA;
- > Photographic simulations of the proposed Project from select locations;
- > Assessment of the visual impacts associated with the Project; and
- > Description of measures proposed to minimize visual impact.



 Project Area

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1-1: Project Location - US Topographic
Visual Resource Assessment for the Telesto Energy Project
Telesto Energy Project, LLC
Hardin County, Kentucky



76 San Marcos Street, Austin, TX 78702 USA
 Phone: (+1) 512-306-9669
 www.cardno.com

Date: 5/19/2022

File Path: S:\PROJECTS\1x.Energy\E319302605 - Telesto Solar KY\GIS\1-1 - Project Location - Topo.mxd

Basemap: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Analyst: samuel.waltman

1.2 Project Location and Description

The Project is located to the immediate east of Elizabethtown, in Hardin County, Kentucky. It is bisected by the Illinois Central Gulf Railroad which runs north/south through the Project Area, and by Cecilia Road, which also runs north/south through the Project Area.

At the time of this study, the total acreage of the privately-owned parcels within which the planned Project is 1,273.5-acres (Study Area), but only 563 acres are expected to be occupied by project components (Project Area). The land use within and immediately adjacent to the Project Area consists primarily of agricultural land, with two large overhead transmission lines that abut the Project.

The proposed Project is a solar power electric generation facility with a generating capacity up to 110 megawatts (MW) alternating current (AC). The Project will include the installation of single-axis tracking solar panel arrays mounted on support piles that are driven into the ground. Additionally, a collection substation will be constructed, which will collect the generated electricity and increase the voltage for transfer to the electric transmission grid. Inverters will be installed to convert the generated electricity from direct current to alternating current, which will be transferred to the collection substation via buried collection lines. Groupings of facility infrastructure will be surrounded by fencing for safety and security. Gravel covered permanent access roads will be constructed to provide access to solar array components for the use by maintenance crews and emergency services. The preliminary locations of the proposed major Project components are illustrated in Figure 1-2.

1.2.1 Visual Study Area

Traditionally, a VRA may be prepared to evaluate the visual impacts to recreational, scenic, and historic resources from a proposed generating facility within a 10-mile radius; however, a 10-mile radius is an excessive size for a study area for this assessment due to the low profile of the proposed Project components and the results of the visibility analysis presented in this report. In order to determine a more appropriately sized study area, a viewshed analysis was conducted to better understand the Project's area of potential effect. The viewshed analysis indicated that areas of potential Project visibility do not extend beyond 5-miles, with only discrete corridors and pockets of visibility extending beyond 0.5-miles from the Project. As such, it was determined that a 5-mile radius around the Project would be a more than sufficient study area for the purposes of this assessment. The Visual Study Area (VSA) encompasses approximately 115.6 square miles and is located wholly within Hardin County. The location and extent of the VSA is illustrated in Figure 1-3.



- Project Area
- Substation
- Fenceline
- Solar Panel Arrays

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1-2: Preliminary Project Layout Map

Visual Resource Assessment for the Telesto Energy Project

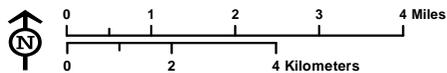
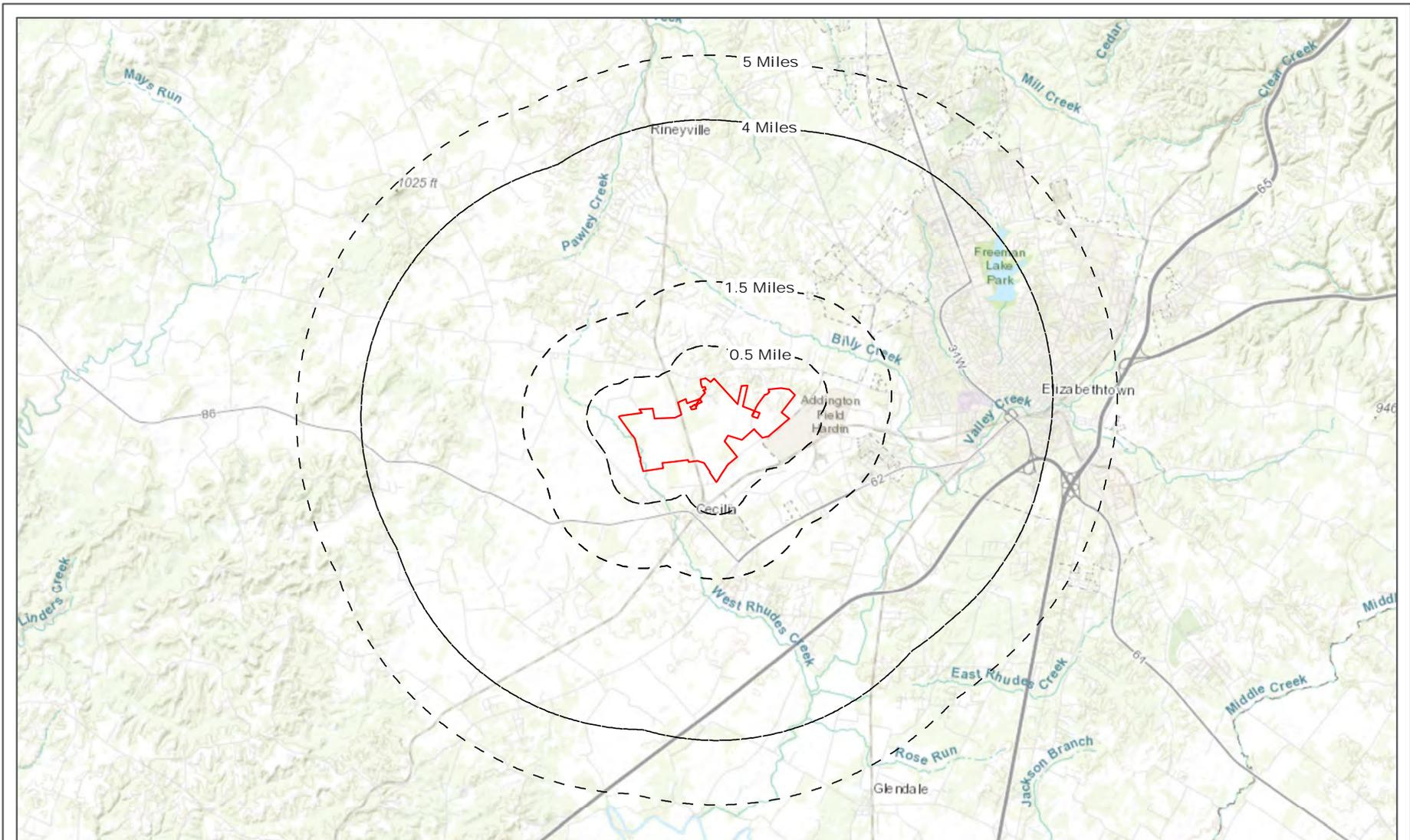
Telesto Energy Project, LLC

Hardin County, Kentucky

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Date: 5/19/2022 File Path: S:\PROJECTS\7x.Energy\E319302605 - Telesto Solar KY\GIS\1-2 - Preliminary Project Layout.mxd
 Basemap: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Analyst: samuel.waltman



Project Area
 - - - Visibility Range Rings

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1-3: Visual Study Area Map

Visual Resource Assessment for the Tealeto Energy Project
 Tealeto Energy, LLC
 Hardin County, Kentucky



76 San Marcos Street, Austin, TX 78702 USA
 Phone: (+1) 512-306-9669
 www.cardno.com

Date: 5/19/2022

File Path: S:\PROJECTS\Tealeto Energy\E319302605 - Tealeto Solar KY\GIS\1-3 - Visual Study Area.mxd

Basemap: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Analyst: samuel.waltman

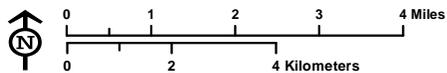
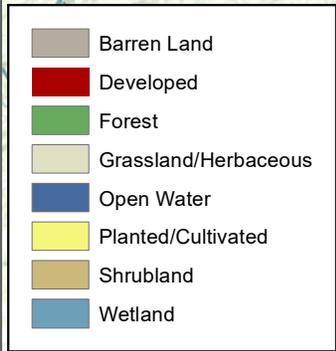
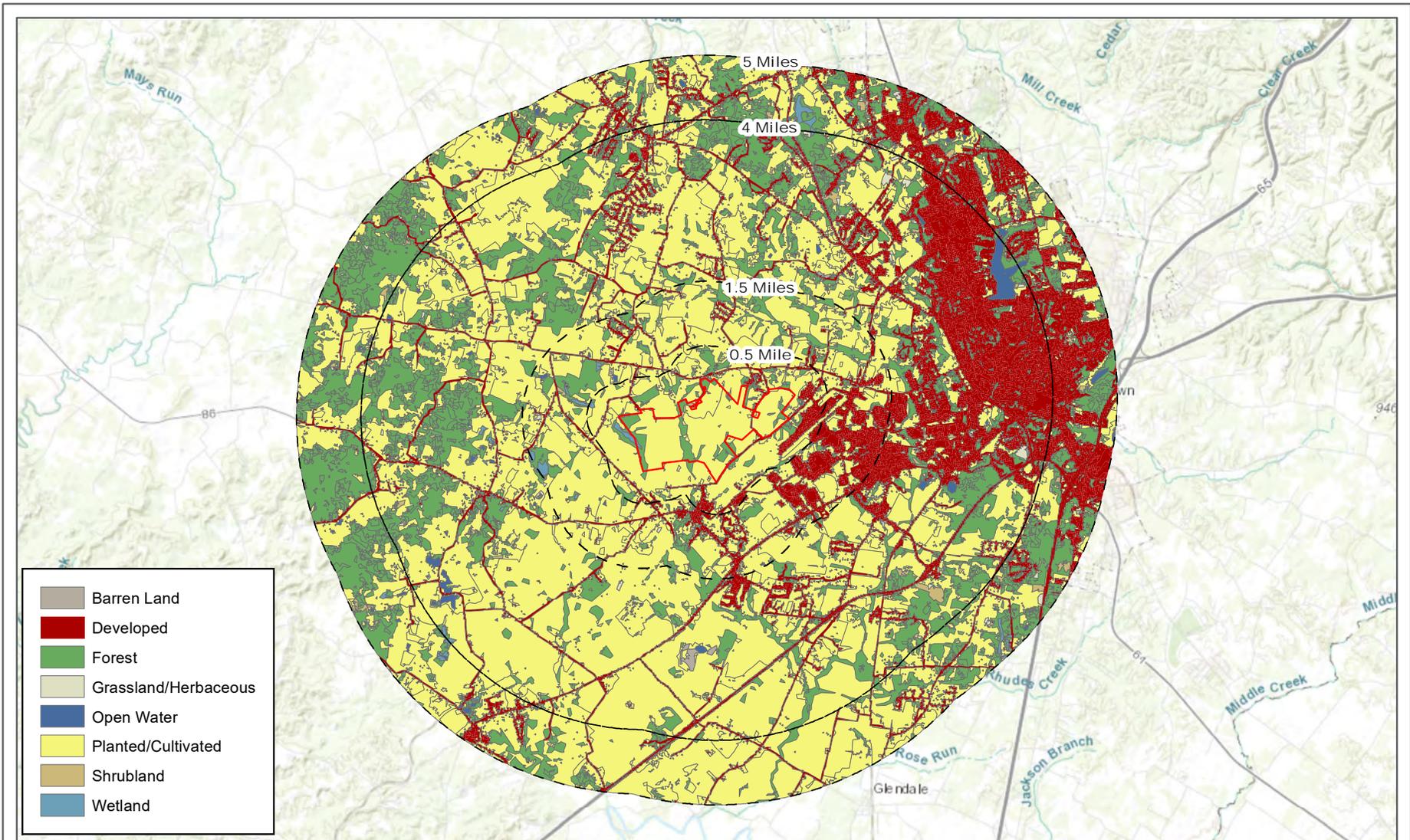
1.2.2 Landscape Character

The land use and landscape community types within the VSA are based on data provided by the Multi-Resolution Land Characteristics Consortium (MRLC) from the 2011 National Land Cover Database, amended 2019 (MRLC 2019). Understanding the landscape types (LTs) within the VSA provides the framework for analyzing the potential visual effects of the Project. These LTs were categorized based on the similarity of various features, including landform, vegetation, and/or land use patterns. The LTs defined within the VSA are presented in Table 1-1 and Figure 1-4.

Table 1-1 Landscape Types within the Visual Study Area

Landscape Type	Total Area of LT within the Visual Study Area (acres)	Total Area within the Visual Study Area (percent)
Planted/Cultivated	42,035.09	56.80%
Forest	17,114.04	23.12%
Developed	13,535.73	18.29%
Open Water	419.20	0.57%
Shrubland	374.97	0.51%
Grassland/Herbaceous	234.31	0.32%
Wetland	210.30	0.28%
Barren Land	83.36	0.11%
Grand Total	74,006.99	100.00%

The Project components are proposed to be built principally within the Planted/Cultivated LT, which makes up 56.80% of the VSA. The agricultural LT has the greatest opportunity for views of PV panels within the Project Area and vicinity due to the relatively low growing crops and lack of mature vegetation and other screening. The Forest LT makes up 23.12% of the VSA. Views within the Forest LT are typically limited due to the presence of mature trees and dense vegetation. The Developed LT makes up 18.29% of the VSA and includes the City of Elizabethtown. The Developed LT typically provides limited outward views due to the presence of buildings and closely situated houses, landscaped yards/planted vegetation, utility poles, and other visual clutter. The Open Water and Wetlands LTs are scattered throughout the VSA and collectively make up only 0.85% of the land area. These LTs are often associated with river or stream corridors, the most notable being the tributaries of West Rhudes Creek, where long distance views are typically limited due to the presence of tree-lined creek banks and adjacent forested slopes.



Project Area
 Visibility Range Rings

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1-4: Land Cover Types within the Visual Study Area
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 Hardin County, Kentucky

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 File Path: S:\PROJECTS\Tealesto Energy\E319302605 - Tealesto Solar KY\GIS\1-4 - Land Cover within VSA.mxd
 Basemap: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Analyst: samuel.waltman

1.2.3 Distance Zones

Distance zones are used to divide the VSA into distinct radii around the Project Area that are based on visual receptors that can be perceived by a viewer. Four distance zones have been defined, per agency protocols published by the U.S. Forest Service, Bureau of Land Management and U.S. Department of Transportation, as a guide for identifying distances from which landscape detail can be perceived by a viewer. Using appropriate adjustments associated with Kentucky's landscape types, the following distance zones have been defined for use in this VSA:

- > Near-Foreground: 0 to 0.5 mile. At this distance, a viewer is able to perceive details of an object with clarity. Surface textures, small features, and the full intensity and value of color can be seen on foreground objects.
- > Foreground: 0.5 to 1.5 miles. At this distance, elements in the landscape tend to retain visual distinction, but specific textures become less defined. So larger intact scale landscapes, seamless mosaics of a landscape type, will appear more as a series or a pattern instead of discrete individual landscape components.
- > Middle ground: 1.5 to 4.0 miles. The middle ground is the prevalent distance at which landscapes are seen. At these distances a viewer can recognize trees and individual structures but not in great detail. This is the zone where the parts of the landscape start to merge; individual hills become a range, individual trees merge into a forest, and buildings appear as shapes. Colors will be softened and blended. Contrast in texture between landscape elements will also be decreased.
- > Background: Over 4.0 miles. The background encompasses the general regional landscape within the viewshed. Within this distance zone, the landscape is simplified; little detail is visible, vegetation and non-vegetated areas are seen as blocks of color, and colors are muted by atmospheric haze. Prominent land masses or other regional features (mountains, larger bodies of water, vast tracks of open lands, etc.) and/or the skyline are often the overriding visual characteristics in the background. The background acts as the backdrop for the foreground and middle ground features, creating the basis of the regional scenic quality.

For the purpose of this assessment, the visual conditions described in these distance zones depict potential perspectives for viewers during periods of peak visual clarity, and do not account for variations in environmental factors such as atmospheric conditions, time of day, or background composition/coloration.

The landscape types defined within the distance zones of the VSA are presented in Table 1-2. As can be seen, the most significant landscape type, Planted/Cultivated, is reflective of the agricultural nature of the area. Forest is characteristic of certain areas within the VSA, with density of forested areas in each given location varying as shown on Figure 1-4. Also of note, the Developed LT only makes up an average of approximately 18.3% across all distance zones within the VSA.

Table 1-2 Distance Zones by Landscape Type

Common Name	Total Area (acres) and Percent of Landscape Type in Distance Zone			
	Near-Foreground (0 – 0.5 mile)	Foreground (0.5 – 1.5 miles)	Middle Ground (1.5 – 4.0 miles)	Background (>4.0 miles)
Planted/Cultivated	3,250.16 (75.01%)	5,822.29 (68.37%)	22,043.32 (57.00%)	10,919.32 (48.55%)
Forest	582.08 (13.43%)	1,035.37 (12.16%)	8,626.19 (22.31%)	6,870.40 (30.55%)
Developed	463.54 (10.70%)	1,544.10 (18.13%)	7,276.46 (18.82%)	4,251.62 (18.91%)
Open Water	1.60 (0.04%)	15.24 (0.18%)	296.94 (0.77%)	105.42 (0.47%)
Shrubland	7.55 (0.17%)	33.12 (0.39%)	164.58 (0.43%)	169.72 (0.75%)
Grassland/Herbaceous	2.79 (0.06%)	14.30 (0.17%)	148.99 (0.39%)	68.24 (0.30%)
Wetland	25.14 (0.58%)	44.89 (0.53%)	46.61 (0.12%)	93.65 (0.42%)
Barren Land	--	6.12 (0.07%)	66.37 (0.17%)	10.88 (0.05%)
Total Distance Zone Area	4,332.86	8,515.43	38,669.46	22,489.24

2 Methodology

2.1 PV Array Viewshed Analysis

Cardno conducted a viewshed analysis to assess the visibility of solar panels within the Project Area. The analysis was conducted using a digital surface model (DSM) derived from the Statewide Imagery Program's (KyFromAbove) 2021 LIDAR data for Hardin County and enhanced with Esri ArcGIS® software. Because the specific layout of solar panels is in the preliminary design phase, sample points were placed approximately 400 to 1,000 feet apart along the proposed infrastructure within the Project Area boundary. The sample points were placed at a height of 9 feet to represent the maximum height of the solar panels and the analysis assumed a viewer height of 6 feet. Although the proposed substation and interconnection structures will result in some minimal visual impacts in their immediate vicinity, their location is in close proximity to an existing substation and overhead power line corridor and will comprise a footprint considerably smaller than the proposed solar panels. For these reasons, the DSM did not include these structures.

The viewshed analysis incorporated the screening effects of existing topography, structures, and vegetation within the VSA. This was accomplished by creating a DSM of the VSA from the LIDAR data, which includes the elevations of buildings, trees, and other objects large enough to be resolved by LIDAR technology. Transmission lines that were included in these LIDAR data were removed from the resulting DSM and road centerlines were buffered 50 feet to remove utility lines. LIDAR data for these narrow, vertical landscape features are removed from the DSM to avoid including artificial screening in the analysis. Additionally, vegetation within the fence line was removed, including narrow hedgerows that will be cleared during construction of the Project. This was done to simulate bare-earth elevation.

Although the viewshed analysis provides a useful representation of Project visibility, there are conditions that are not incorporated into the DSM (e.g., color, distance from viewer, and atmospheric/weather conditions). Therefore, being located within the VSA does not reflect actual visibility of the Project.

2.2 Visually Sensitive Resources

Below are the potential VSR categories that may be present within the VSA. In addition, other aesthetic resources were considered for evaluation based on the type of resource, or the prominence within the VSA. Typical VSRs include the following:

- > Landmarks such as districts, sites, buildings, structures, and objects that are recognized by, registered with, or identified as eligible for registration by the national registry of natural landmarks, the state historical preservation office, or the Kentucky Department of Fish & Wildlife
- > Recreation Areas that are any formally adopted land and water recreation areas, recreational trails, scenic rivers, scenic routes or byways
- > Registered landmarks of historic, religious, archaeological, scenic, natural, or other cultural significance.
- > Other public areas such as state, US, and Interstate Highways, Schools, Cities, and Villages.

2.3 Field Verification

Cardno conducted a site visit to the Project Area on March 23, 2022, to verify the results of the viewshed analysis, document characteristics of the LTs and existing visual screening, and collect photographs for use in the creation of visual simulations.

The Cardno field team drove public roads throughout the Project Area and collected photographs from 12 individual viewpoints. A viewpoint location map and photolog are included in Appendix A.

2.4 Creation of Visual Simulations

Visual simulations of key components of the proposed Project were developed using a three-dimensional (3D) computer model of the proposed Project infrastructure based on specifications, dimensions, and locations provided by Telesto. Camera specifications and global positioning system (GPS) coordinates collected at each photo location were incorporated into the 3D model. Next, the photo was pulled into the model and the scale and perspective of the project components (e.g., fence, panels) were adjusted appropriately.

At viewpoints where vegetative screening is proposed, plantings were added to the simulations to represent conditions approximately 5 to 7 years after installation. Vegetative screening was illustrated based on the following screening applications that are planned for certain segments of the Project's perimeter. Greater detail of the module composition can be found in the separate landscaping plan prepared for the Project.

- > **Module 1** –Vertical Softening (single row evergreen trees, spaced 15ft on-center): for use in areas of high viewership and visibility potential, but low stationary (residential or recreational) activity occurs.
- > **Module 2** –Adjacent Resource (double row evergreen trees, spaced 15ft on-center): Provides the highest level of screening, for use in areas where stationary adjacent uses and non-participating viewers could be impacted by the installation of Project components.

3 Results

3.1 Viewshed Analysis

3.1.1 PV Array Viewshed Analysis

Potential visibility of the proposed Project is illustrated in Figure 3-1 and results of the analysis are summarized in Table 3-1. The results of the analysis indicate the Project will be screened from approximately 98.8% of the VSA by topography, vegetation, and physical structures.

Table 3-1 PV Array Viewshed Analysis Results

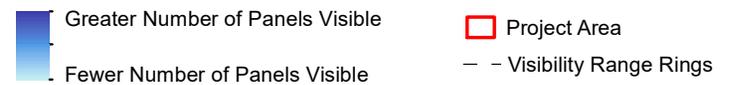
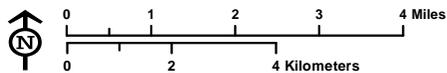
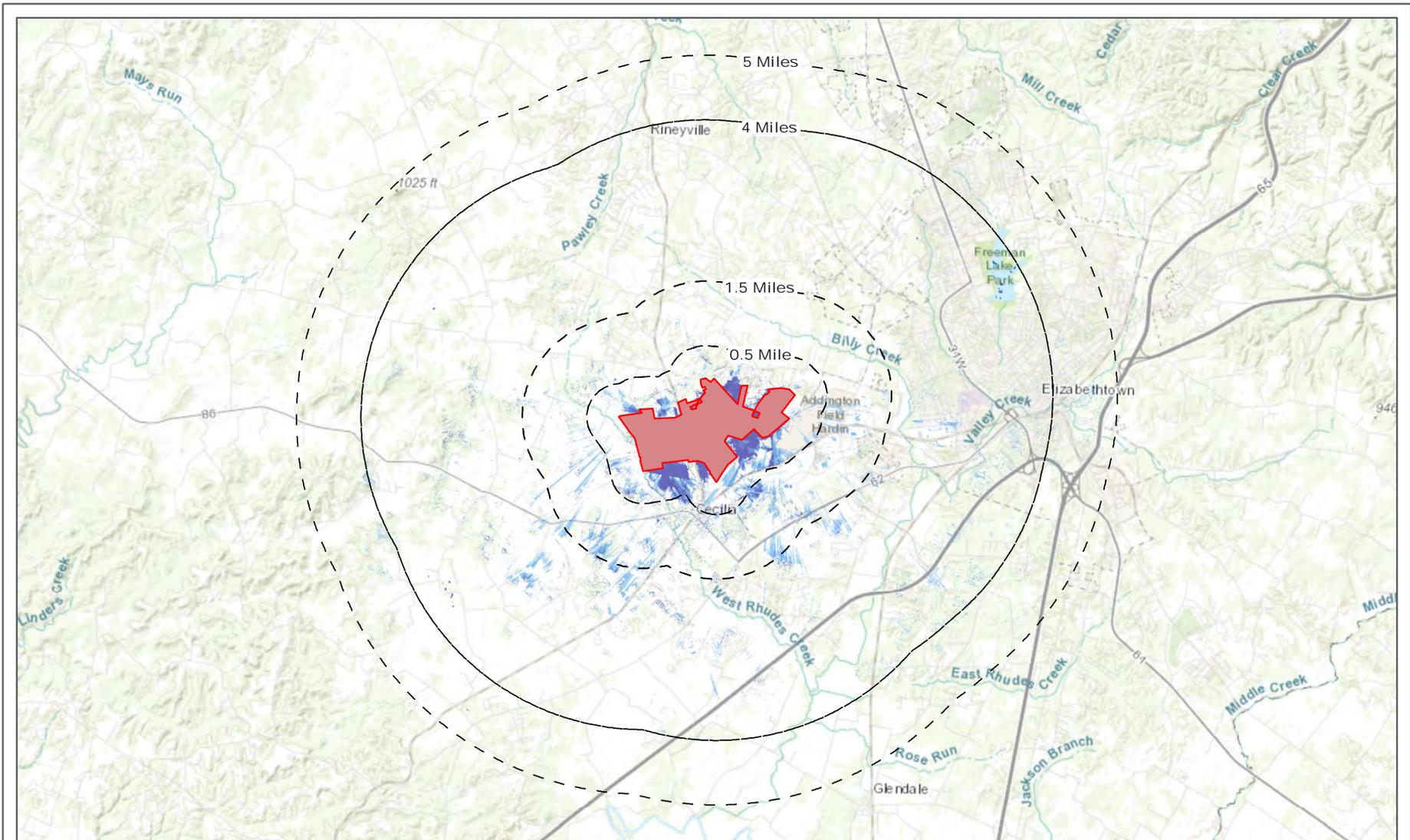
Analysis	VSA	Distance from Project			
		Near-Foreground (0 – 0.5 mile)	Foreground (0.5 – 1.5 mile)	Middle Ground (1.5 – 4.0 mile)	Background (4.0 – 5.0)mile
Total Area	115.6 mi ²	5.9 mi ²	13.1 mi ²	60.1 mi ²	35.1 mi ²
DSM Viewshed Visibility	1.4 mi ² (1.2%)	0.8 mi ² (13.55%)	0.2 mi ² (1.52%)	0.3 mi ² (0.49%)	0.03 mi ² (0.08%)

The majority of Project visibility is concentrated within the near-foreground distance zone, with 13.55% of the area out to 0.5 miles from the Project Area indicated as having potential views of some portion of the Project. Views from areas beyond the near-foreground and into the foreground distance zone (0.5 to 1.5 miles) are better screened, with 1.52% of the foreground distance zone having the potential for views of the PV arrays. The DSM viewshed analysis indicates that potential Project visibility is further reduced at distances beyond the foreground. More than 99% of the VSA is screened from view of the PV arrays in the middle ground (1.5 to 4 miles) and in the background (4 to 5 miles).

The topography and vegetation associated with hills and valleys, rivers and streams, and forested woodlots play a significant role in reducing potential PV array visibility within the VSA. Due to their establishment and orientation throughout the VSA, stream corridors and forested areas serve to concentrate areas of potential visibility in the near-foreground distance zone, on level open ground within agricultural tracts. A few additional locations of potential visibility are present in the distance zones beyond the near-foreground distance zone. These areas are discrete corridors of visibility that result from breaks in the forest vegetation combined with slight topographic elevation. Due to the limited portion of the Project that would be visible, and the distance from the Project, it is unlikely that Project visibility within these narrow corridors or elevated viewpoints would be readily noticeable to a casual viewer.

Existing structures and vegetation (i.e., small woodlots and hedgerows) are assumed to fully block views of the Project. This scenario is likely in leaf-on conditions; however, during leaf-off conditions (fall, winter), this may be conservative since sparsely vegetated areas may not actually provide screening that fully obscure views of the Project. Furthermore, although the LIDAR data used in this analysis is from 2021, any changes to structures and vegetation since its creation would not be represented in the analysis. Cardno reviewed available recent aerial photography and field-collected photos which suggest that the LIDAR data appear to accurately reflect current screening conditions within the VSA.

Figure 3-1 of the DSM viewshed analysis for a 5-mile radius depicts a viewshed that incorporates a vegetative model. This figure illustrates that visibility beyond a 0.5-mile radius will be primarily limited to discrete corridors of agricultural fields at higher elevations to the southwest and southeast. Further analysis is provided on the vegetative model below.



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3-1 Viewshed Analysis - PV Panel (5-mile radius)

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Basemap: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Analyst: samuel.waltman

Potential PV panel visibility within the various LTs, as predicted by the DSM viewshed analysis, is summarized in Table 3-2.

Table 3-2 Landscape Types Viewshed Analysis Results Summary

Analysis	VSA	Landscape Types							
		Planted/ Cultivated	Forest	Open Water	Developed	Grassland/ Herbaceous	Wetlands	Shrubland	Barren
Total Area	115.6 mi ²	64.7 mi ²	26.5 mi ²	0.6 mi ²	21.0 mi ²	0.4 mi ²	0.3 mi ²	0.6 mi ²	0.1 mi ²
DSM Viewshed Visibility	1.4 mi ² (1.2%)	0.9 mi ² (0.7%)	0.3 mi ² (0.2%)	0.02 mi ² (0.02%)	0.1 mi ² (0.08%)	0.004 mi ² (0.003%)	0.003 mi ² (0.0002%)	0.001 mi ² (0.0008%)	0.001 mi ² (0.0008%)

The greatest potential for visibility of the proposed solar arrays is indicated within the Planted/Cultivated LT. The DSM viewshed indicates that 1.2% of the total VSA could potentially offer views of the proposed PV panels from this LT. Visibility within the Planted/Cultivated LT is most heavily concentrated within the Project itself, and within adjacent open agricultural fields in the near-foreground distance zone.

The potential for solar array visibility within the Forested LT is indicated in approximately 0.2% of the total VSA. Visibility may occur in small breaks or clearings in the forest vegetation, but the occurrence of these areas is generally limited. Visibility within this zone occurs most frequently along the forest edges where abutting open fields provide opportunities for outward views. However, there will be little to no PV panel visibility from the majority of the forested areas, particularly during the growing season.

The LTs with the least amount of potential solar array visibility are the Developed (0.08%), Open Water (0.02%), Grassland/Herbaceous (0.003%), Wetlands (0.0002%), Shrubland (0.0008%), and Barren Land (0.0008%). Visible portions of these LTs comprise 0.124% of the total VSA and their visibility varies considerably based on proximity to the Project, elevation, and orientation.

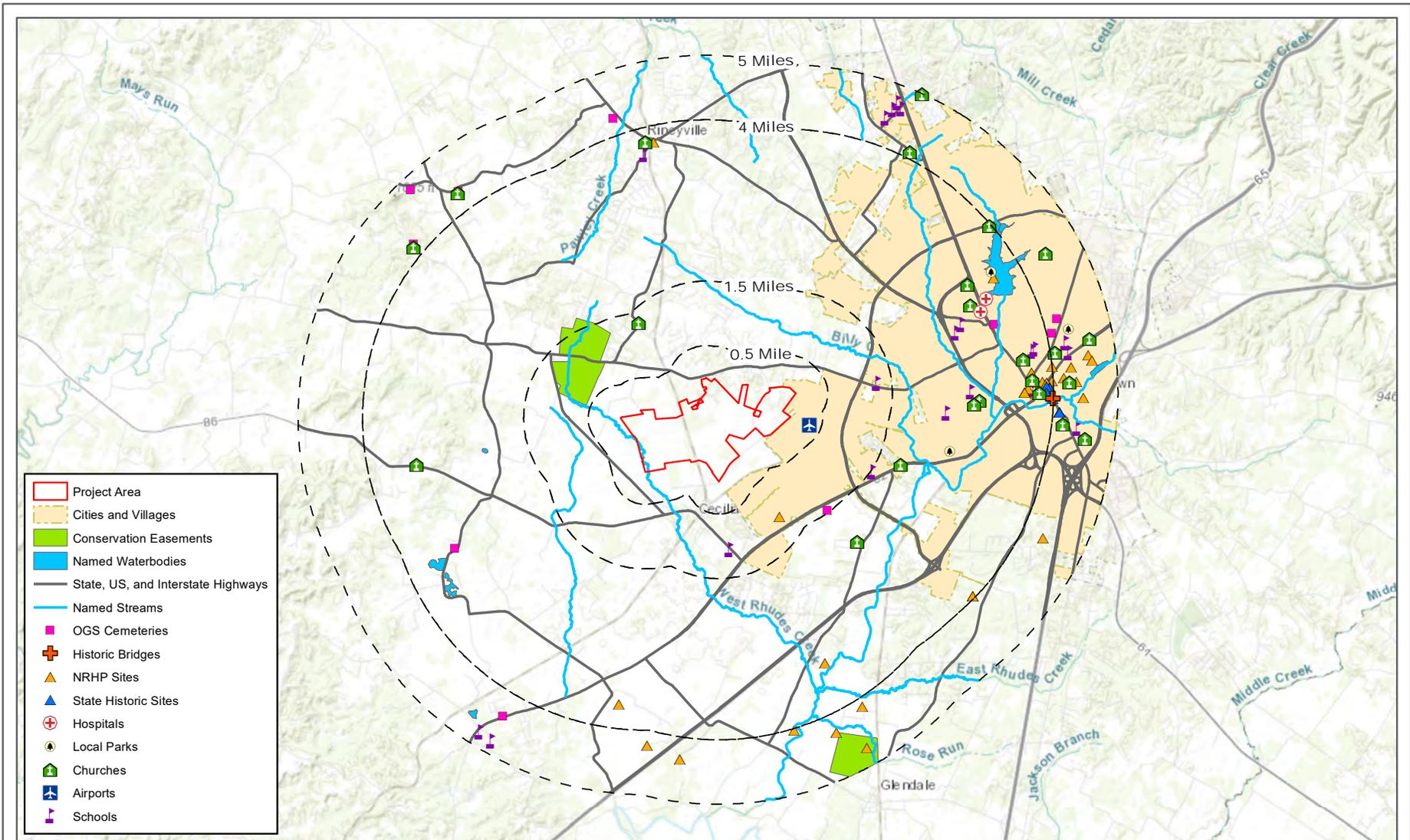
3.1.2 Visibility Results from Visually Sensitive Resources

As summarized in Table 3-3, the DSM viewshed analysis indicates that 15 of the 145 VSRs identified within the VSA (10%) may have some visibility of the PV arrays. The locations of mapped VSRs within the VSA are illustrated in Figure 3-2.

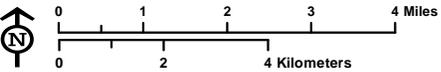
Table 3-3 Visually Sensitive Resources in the DSM Viewshed

Visually Sensitive Resources	Total Number of Resources within the Visual Study Area	Total Number of Resources with Visibility
<i>Properties of Historic Significance</i>		
National Historic Landmarks (NHL)	0	0
Sites Listed on National or State Registers of Historic Places (NRHP/SRHP)	41	0
National/State Historic Sites	0	0
Historic Bridges	1	0
OGS Cemeteries	10	1
Kentucky Historic State Markers	11	0
Total	63	1

Visually Sensitive Resources	Total Number of Resources within the Visual Study Area	Total Number of Resources with Visibility
<i>Designated Scenic Resources</i>		
Rivers Designated as National or State Wild, Scenic or Recreational	0	0
Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic ([ECL Article 49 Title 1] or equivalent)	0	0
Scenic Areas of Statewide Significance [Article 42 of Executive Law]	0	0
Other Designated Scenic Resources (Easements, Roads, Districts, and Overlooks)	0	0
Total	0	0
<i>Public Lands and Recreational Resources</i>		
National Parks, Recreation Areas, Seashores, and/or Forests [16 U.S.C. 1c]	0	0
National Natural Landmarks [36 CFR Part 62]	0	0
National Wildlife Refuges [16 U.S.C. 668dd]	0	0
State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]	0	0
Wildlife Areas	0	0
State Forest	0	0
Other State Lands	0	0
Designated Trails	0	0
Local Parks and Recreation Areas	3	0
Conservation Lands/Easements	2	1
Named Lakes, Ponds, and Reservoirs	6	4
Total	11	5
<i>High-Use Public Areas</i>		
State, US, and Interstate Highways	23	6
Cities, Villages,	2	1
Schools	20	2
Airports	1	0
Hospitals	2	0
Churches	23	0
Total	71	9
Total Number of Visually Sensitive Resources in the VSA	145	15



- Project Area
- Cities and Villages
- Conservation Easements
- Named Waterbodies
- State, US, and Interstate Highways
- Named Streams
- OGS Cemeteries
- + Historic Bridges
- ▲ NRHP Sites
- ▲ State Historic Sites
- + Hospitals
- Local Parks
- 🏠 Churches
- ✈ Airports
- 🏫 Schools



- Project Area
- Visibility Range Rings

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3-2: Location of Visually Sensitive Resources

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 File Path: S:\PROJECTS\TX_Energy\E319302605 - Telesto Solar KY\GIS\3-2 - Location of VSRs_Updated.mxd
 Basemap: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

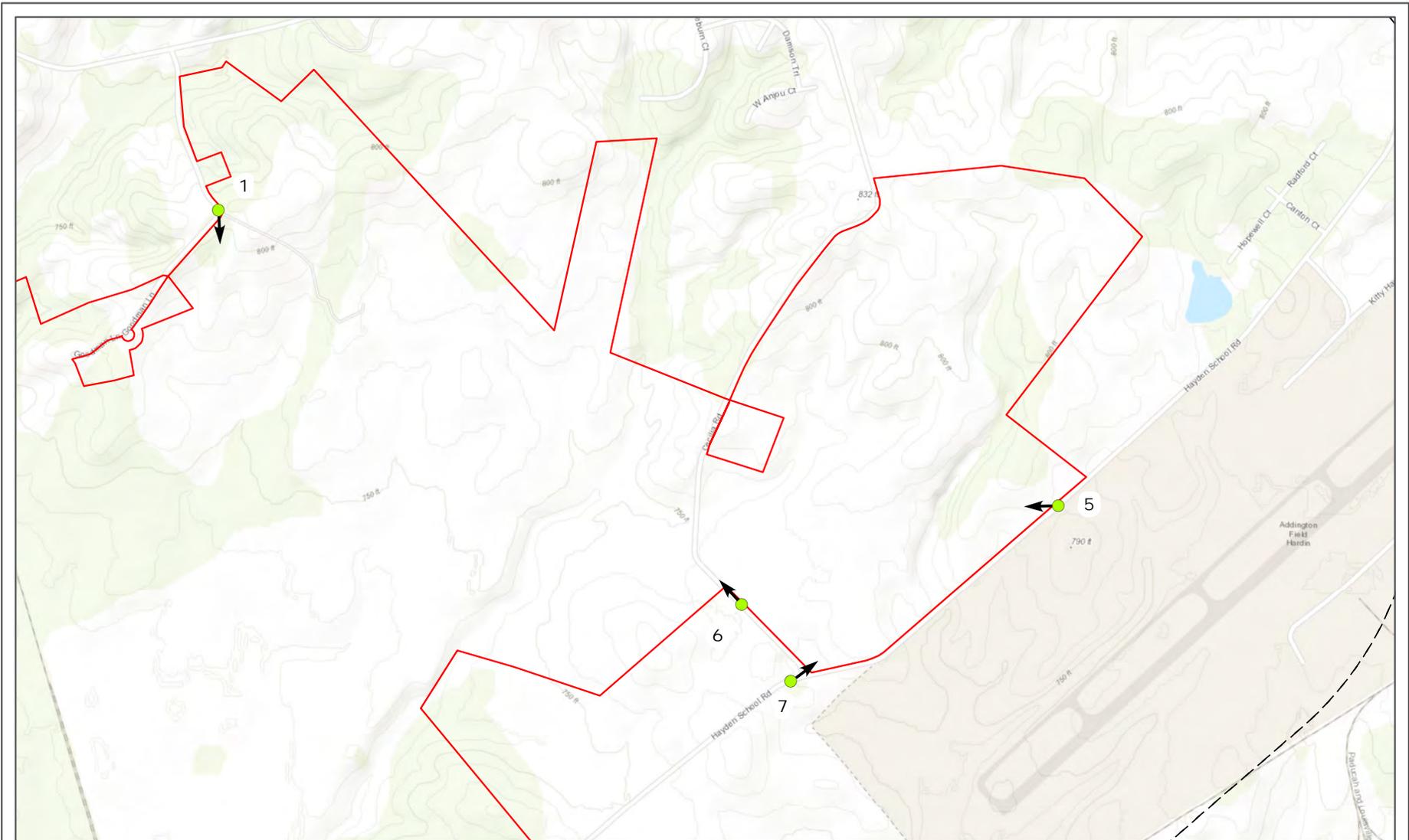
GIS Analyst: samuel.waltman

3.1.3 Field Verification Results

According to the DSM viewshed analysis, the Project will be screened from approximately 98.8% of the VSA by intervening landforms, vegetation, and structures. Field visits confirmed the results of this analysis, as Project visibility was observed to be largely restricted to areas adjacent to the Project Area where public roads are bordered by open agricultural fields. It was also confirmed during field visits that existing topography, as well as mature vegetation associated with hills and valleys, stream corridors, woodlots, and hedgerows will screen the Project from more distant portions of the VSA. Within the near-foreground (0-0.5 miles) distance zone, field review revealed that although portions of the Project are technically visible as indicated in the viewshed analysis, there is a low likelihood of discerning the proposed Project due to the level of visual blending into the background at the outer extents of this distance zone (see Appendix B, Viewpoint 5). During the growing season, visibility of the Project from residences and roadways may also be limited by the growth of cultivated crops in the foreground agricultural fields. The combination of relatively low panel height, along with existing hedgerows, rolling topographic relief, and the atmospheric effects of distance, will significantly limit visibility of the Project from the majority of the VSA.

3.2 Visual Simulations

Visual simulations were created to illustrate the Project from four representative locations. The visual simulations provide a time-lapse from existing conditions, to initial construction of Project components without prescribed plantings, to 5 to 7 years post-construction with the inclusion of prescribed plantings. The locations of the viewpoints selected for the production of visual simulations are illustrated in Figure 3-3. The visual simulations and a discussion of the potential visual effects associated with the Project are summarized below. Full size images are presented in Appendix B.



Project Area

Visibility Range Rings



Visual Simulation Locations

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3-3 Visual Simulation Viewpoints Map

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GIS Analyst: samuel.waltman

3.2.1.1 Viewpoint 1 Existing Conditions

Viewpoint 1 is situated along a curve of Goodman Lane, facing south towards an agricultural field. The existing conditions in this view from several residences show the rural field that extends from the foreground to the background of the visual. The hedgerows viewed in the middle of the image are located approximately 1,200 feet from the viewpoint (Figure 3-4, Existing Conditions).

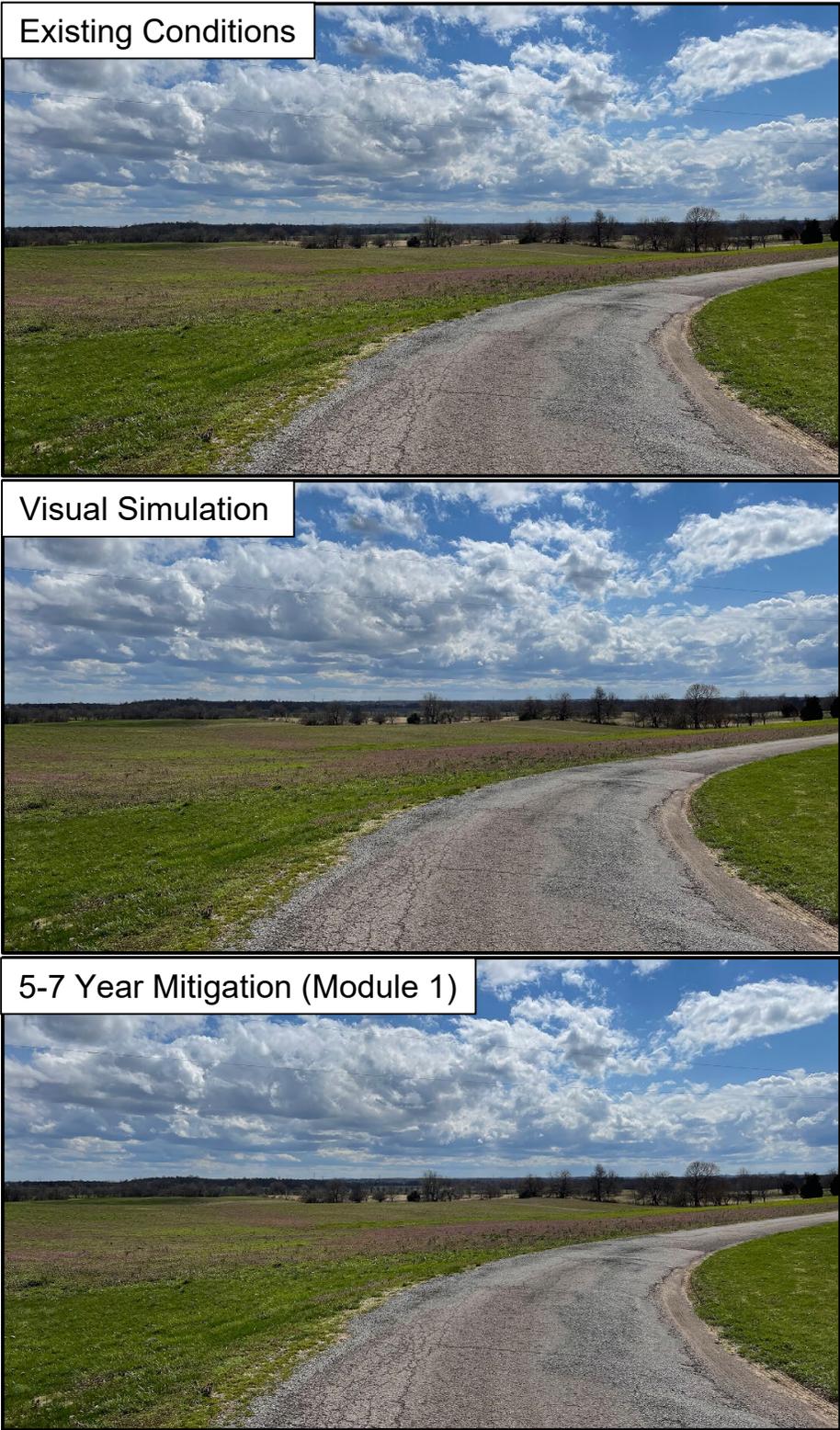
3.2.1.2 Viewpoint 1 Proposed Project

With the addition of the proposed Project, panel arrays and associated fence line can be seen approximately 1,185 feet from the viewpoint location (Figure 3-4, Visual Simulation).

3.2.1.3 Viewpoint 1 Proposed Project with Mitigation

With proposed mitigation plantings placed and established 5 to 7 years following installation, the area comprising the proposed panel arrays is surrounded by a single row of large evergreen trees. Although stationary views of the Project remain available through gaps in the vegetation, adjacent plantings interrupt the horizontal lines of the Project components, allowing them to blend into the vegetated background (Figure 3-4, 5 to 7 Year Mitigation).

Figure 3-4 Viewpoint 1 - Existing Conditions, Visual Simulation, and 5-7 Year Mitigation



3.2.1.4 Viewpoint 5 Existing Conditions

Viewpoint 5 is situated along Hayden School Road facing west towards an open agricultural field. The existing conditions in this view show the rural field in the foreground, with a forested riparian area in background of the visual. (Figure 3-5, Existing Conditions).

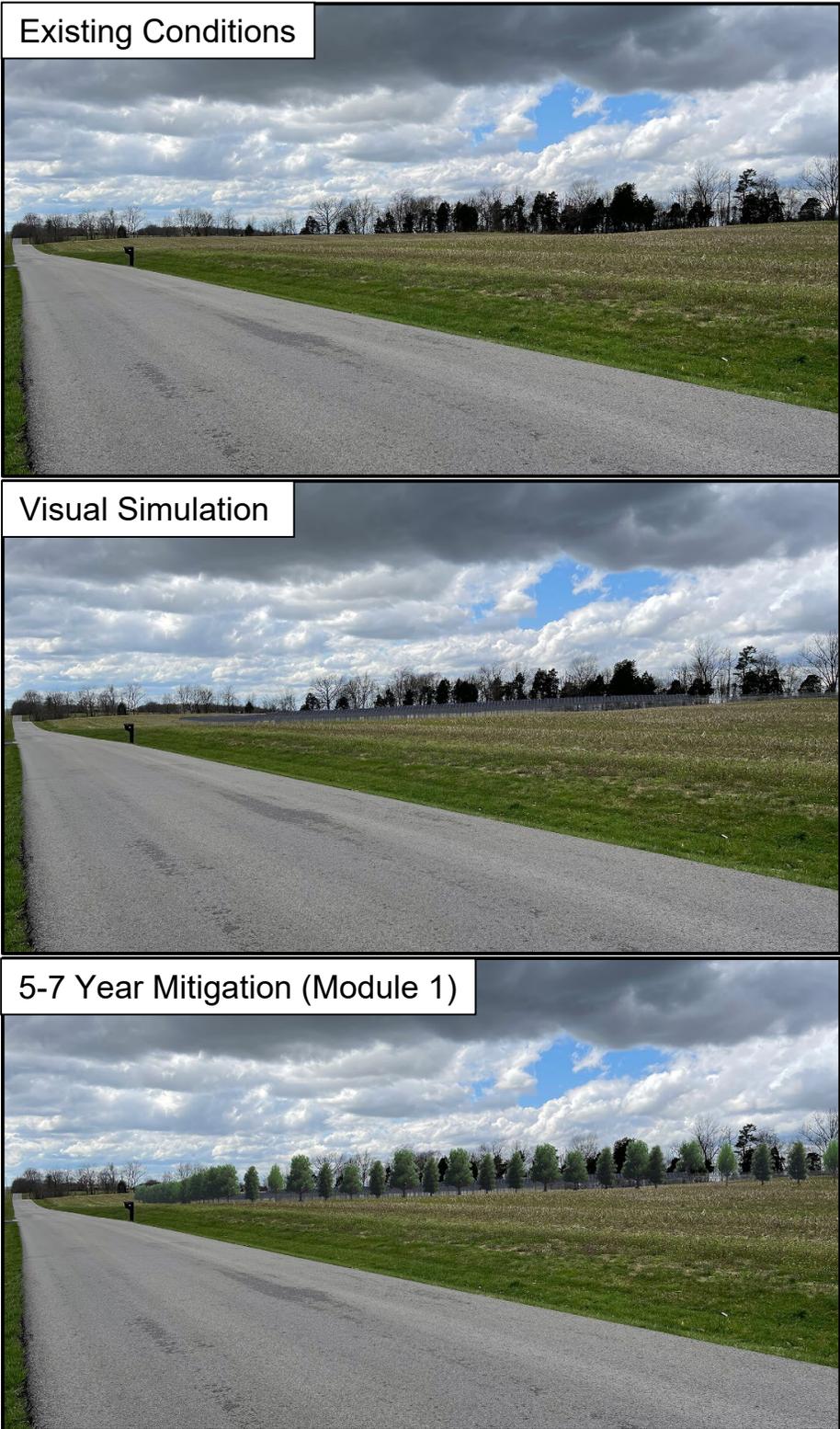
3.2.1.5 Viewpoint 5 Proposed Project

With the addition of the proposed Project, panel arrays and associated fence line can be viewed within the field. The closest panels in the image are approximately 372-feet from the viewpoint (Figure 3-5, Visual Simulation).

3.2.1.6 Viewpoint 5 Proposed Project with Mitigation

With proposed mitigation plantings placed and established 5 to 7 years following installation, the area comprising the proposed panel arrays is surrounded by a single row of large evergreen trees. Although views of the panel arrays remain available from Hayden School Road, the duration of these views will be limited for drivers passing by the Project (Figure 3-5, 5 to 7 Year Mitigation).

Figure 3-5 Viewpoint 5 - Existing Conditions, Visual Simulation, and 5-7 Year Mitigation



3.2.1.7 Viewpoint 6 Existing Conditions

Viewpoint 6 is situated along Cecilia Road, facing northwest along the road with open agricultural fields on both sides. The existing conditions in this view show the rural fields in the foreground of the visual, with several vegetated fence rows and riparian areas visible on slightly elevated topography in the background (Figure 3-6, Existing Conditions).

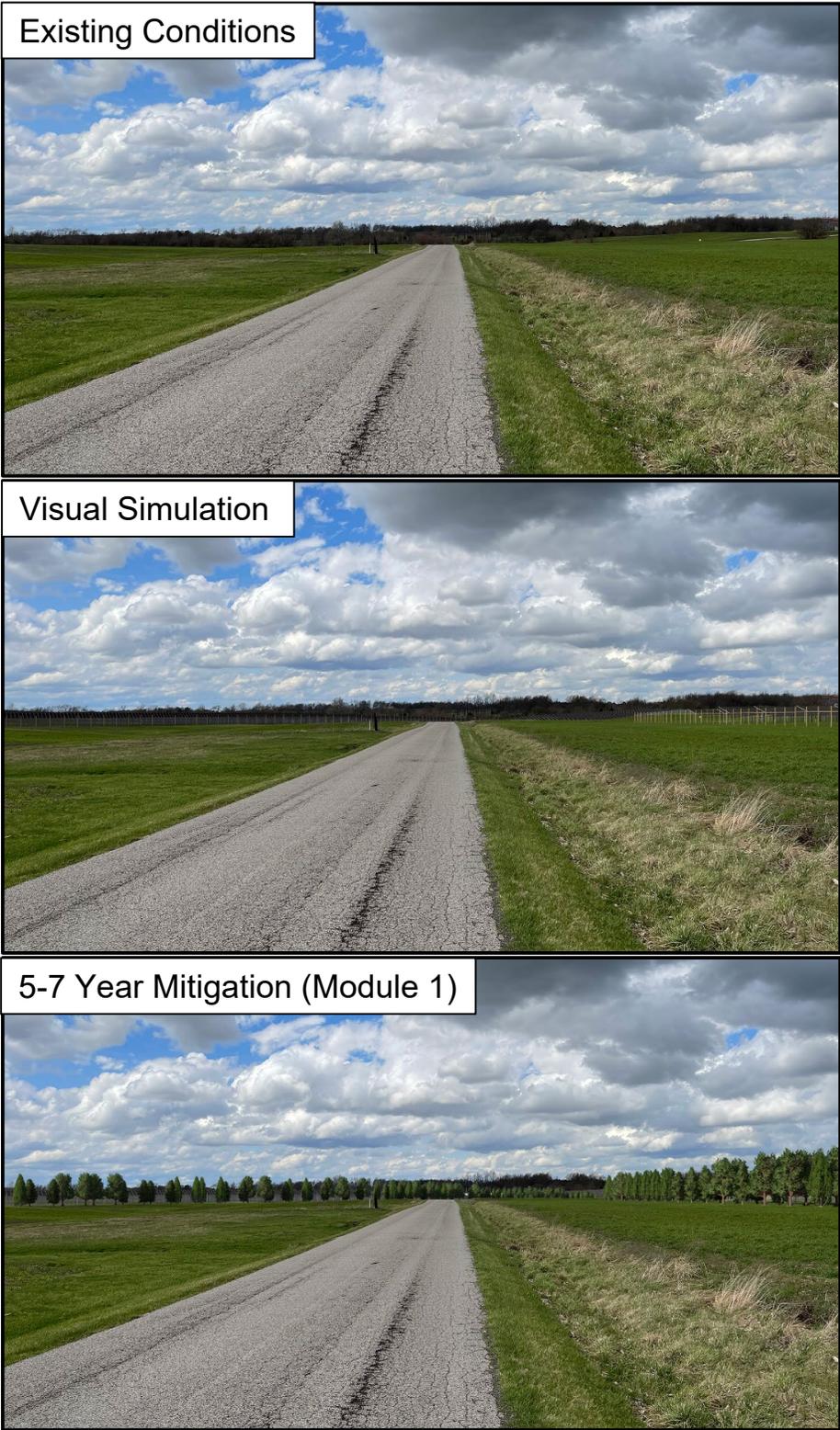
3.2.1.8 Viewpoint 6 Proposed Project

With the addition of the proposed Project, panel arrays and associated fence line can be viewed on both sides of the road. The closest panels in the image are approximately 205-feet from the viewpoint (Figure 3-6, Visual Simulation).

3.2.1.9 Viewpoint 6 Proposed Project with Mitigation

With proposed mitigation plantings placed and established 5 to 7 years following installation, the areas comprising the proposed panel arrays are surrounded by double rows of large evergreen trees. Although views of the panel arrays remain available from Cecilia Road through gaps in the vegetation, the duration of these views will be limited for drivers passing the Project (Figure 3-6, 5 to 7 Year Mitigation).

Figure 3-6 Viewpoint 6 - Existing Conditions, Visual Simulation, and 5-7 Year Mitigation



3.2.1.10 Viewpoint 7 Existing Conditions

Viewpoint 7 is situated Hayden School Road, facing northeast towards an open agricultural field. The existing conditions in this view show residential yards on both sides of the road in the foreground of the visual, with a vegetated fence row beginning 180-feet from the viewpoint. In the middle ground, a house and silo structure can be viewed approximately 555-feet from the viewpoint. In the background of the visual, the agricultural field is bounded by vegetated fence rows and forested riparian areas (Figure 3-7, Existing Conditions).

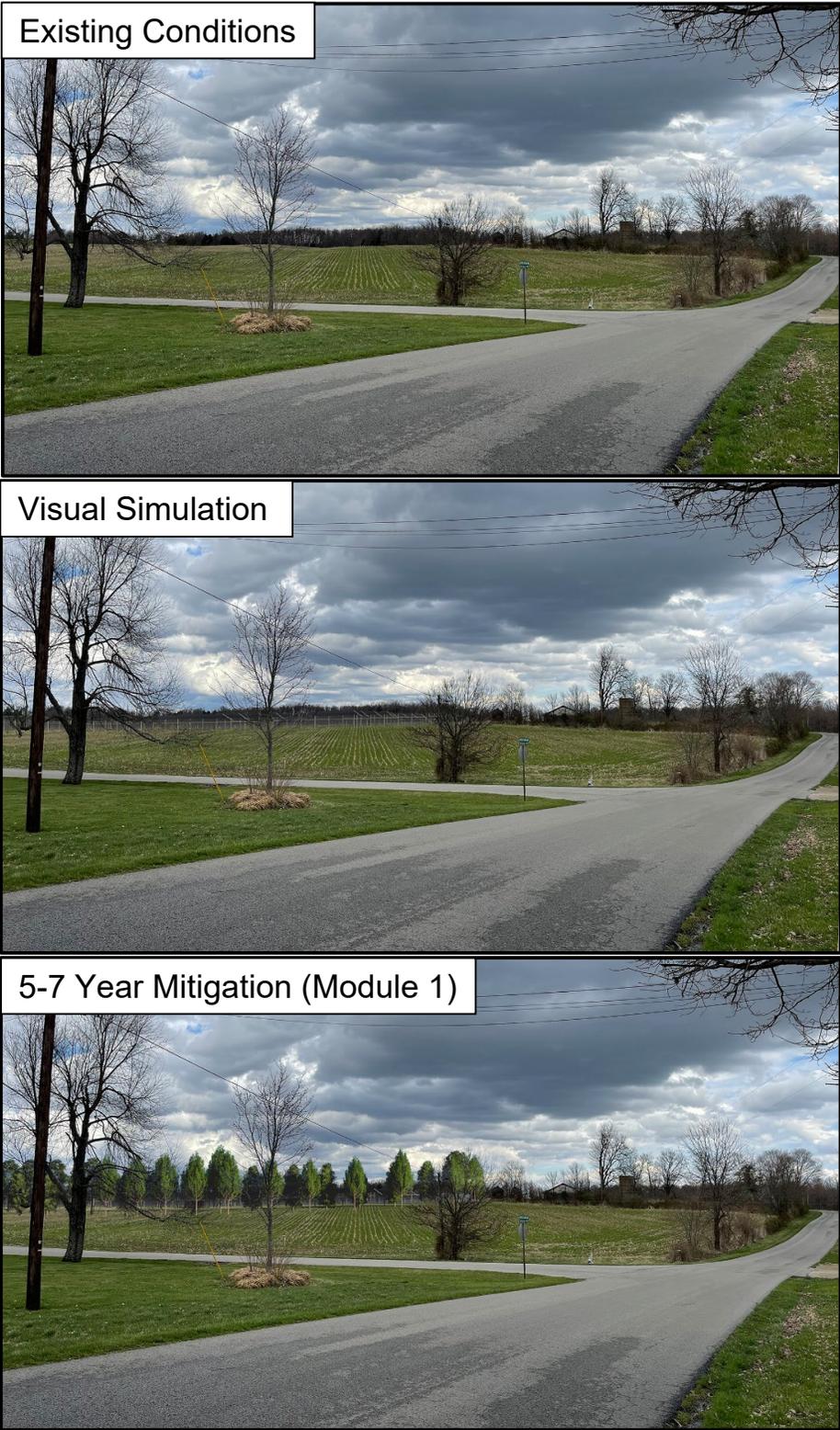
3.2.1.11 Viewpoint 7 Proposed Project

With the addition of the proposed Project, panel arrays and associated fence line can be viewed in the image middle ground within the agricultural field. The closest panels in the image are approximately 490-feet from the viewpoint (Figure 3-7, Visual Simulation).

3.2.1.12 Viewpoint 7 Proposed Project with Mitigation

With proposed mitigation plantings placed and established 5 to 7 years following installation, the area comprising the proposed panel arrays is surrounded by a double row of large evergreen trees. Although views of the panel arrays remain available from Hayden School Road through gaps in the vegetation, the duration of these views will be limited for drivers passing the Project (Figure 3-7, 5 to 7 Year Mitigation).

Figure 3-7 Viewpoint 7 - Existing Conditions, Visual Simulation, and 5-7 Year Mitigation



4 Conclusions

4.1 Visual Resource Assessment Summary

Results of this viewshed analysis indicate that the proposed solar arrays associated with the Project will be screened from view in approximately 98.8% of the 5-mile radius VSA. Visibility is concentrated within the Project Area and adjacent open fields. The viewshed analysis also suggests that panel visibility substantially diminishes beyond the near-foreground distance zone (0.5 mile).

The viewshed analysis of the 145 identified VSRs within the VSA indicates that 15 (10%) have potential Project visibility. Viewshed results suggest that views from VSRs will generally be small and/or include only a limited number of Project components.

The Field visit confirmed the results of the viewshed analysis. Beyond 0.5 mile, Project visibility will be reduced due to screening provided by topography and hedgerows in combination with the low height of the solar panels. Additionally, discernibility of panels that are visible in the outer extents of the 0.5 mile range will be diminished due to visual blending with the background at these distances.

The Project will result in varying levels of visual impact when viewed from its surrounding vicinity. The Project will install structures that will alter the scenic quality and/or existing agricultural character of the landscape. However, as illustrated in the visual simulations, Project visibility and potential visual impact will diminish rapidly at greater distances. For this reason, it is anticipated that the impacts will be localized to a limited number of areas adjacent to the Project. Additionally, these impacts will likely be mitigated to some degree by the presence of seasonal crops in actively farmed fields.

4.2 Mitigation

Telesto proposes to plant vegetation along the Project boundary at publicly viewable areas to reduce or screen views of constructed PV panels. The conceptual plan developed for this Project is based on the assumption that 100% screening is not necessary and that introduction of native vegetation in clumps and hedgerows will adequately mimic the existing plant materials observed in the vicinity of the Project Area. The visual simulations illustrate how the proposed planting module will minimize potential visual impacts created by the installation of the PV panels. Although the mitigation represented in the visual simulations is conceptual at this time, and planting composition may be adjusted, the design goals and approach will not change. Additional details can be found in the separate landscaping plan for the Project.

5 References

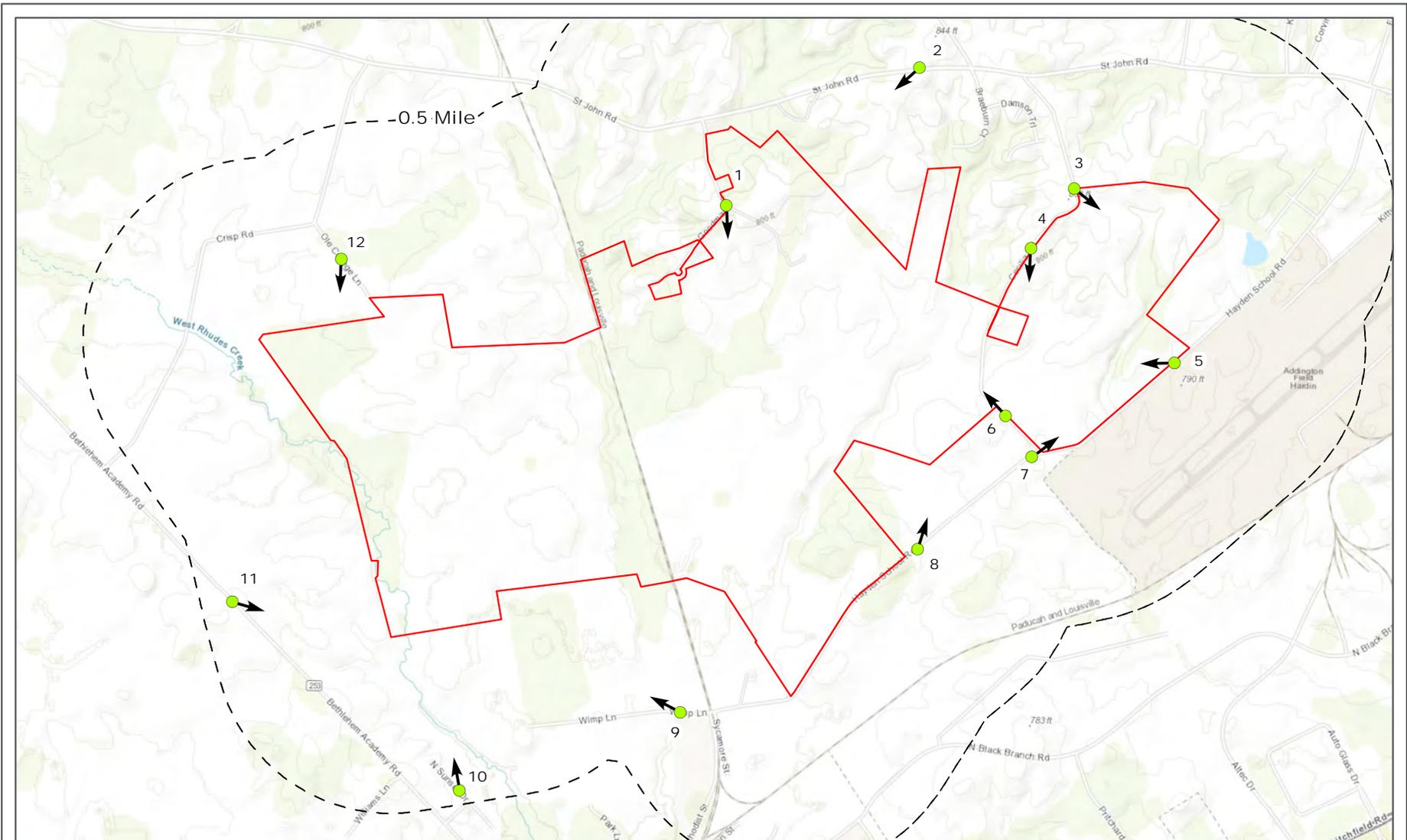
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Visual Resource Assessment and
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Telesto Energy Project

APPENDIX

A

VIEWPOINT LOCATION MAP AND
PHOTOLOG



Project Area
 Visibility Range Rings
▲ Visual Simulation Locations



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Appendix A: Viewpoint Photo Locations Map
Visual Resource Assessment for the Telesto Energy Project
Telesto Energy, LLC
Hardin County, Kentucky

76 San Marcos Street, Austin, TX 78702 USA
 Phone: (+1) 512-306-9669
www.cardno.com

Date: 5/19/2022
 File Path: S:\PROJECTS\7A_Energy\E319302805 - Telesto Solar KY\GIS\Appendix A Photo Locations_update.mxd
 Basemap: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

GIS Analyst: samuel.waltman

Telesto Energy Viewpoint Photolog



Viewpoint 1

Direction Facing

South

Location

37.693242, -85.954406

Caption/Description

View from Goodman Ln in Hardin County. 911 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.



Viewpoint 2

Direction Facing

Southwest

Location

37.699047, -85.94455

Caption/Description

View from KY-1357 (St. John Rd) in Hardin County. 1,771 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.



Viewpoint 3

Direction Facing

Southeast

Location

37.694194, -85.936439

Caption/Description

View from the Ccilia Rd in Hardin County. 627 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.

Telesto Energy Viewpoint Photolog



Viewpoint 4

Direction Facing

South

Location

37.691711, -85.938614

Caption/Description

View from Cecilia Rd in Hardin County. 888 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.



Viewpoint 5

Direction Facing

West

Location

37.687094, -85.931075

Caption/Description

View Hayden School Rd in Hardin County. 372 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.



Viewpoint 6

Direction Facing

Northwest

Location

37.684792, -85.939758

Caption/Description

View from Cecilia Rd in Hardin County. 205 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.

Telesto Energy Viewpoint Photolog



Viewpoint 7

Direction Facing

Northeast

Location

37.683125, -85.938378

Caption/Description

View Hayden School Rd in Hardin County. 490 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.



Viewpoint 8

Direction Facing

East/Northeast

Location

37.67925, -85.944197

Caption/Description

View Hayden School Rd in Hardin County. 1,441 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.



Viewpoint 9

Direction Facing

Northeast

Location

37.672375, -85.956306

Caption/Description

View from Wimp Ln in Hardin County. 2,530 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.

Telesto Energy Viewpoint Photolog



Viewpoint 10

Direction Facing

North/Northwest

Location

37.668992, -85.967667

Caption/Description

View from N Sunset Dr in Hardin County. 2,605 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.



Viewpoint 11

Direction Facing

East/Southeast

Location

37.676567, -85.979622

Caption/Description

View from KY-253 (Bethlehem Academy Rd) in Hardin County. 2,621 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.



Viewpoint 12

Direction Facing

South

Location

37.690739, -85.974297

Caption/Description

View Ole College Ln in Hardin County. 1,417 feet from the nearest proposed PV panel, in the Near-Foreground distance zone.

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APPENDIX

B

VISUAL SIMULATIONS

Viewpoint 1 | Elizabethtown

Viewpoint Information

Viewpoint ID: 1
County: Hardin
City/Town: Elizabethtown
Location: Goodman Lane
Coordinates: 37.693242, -85.954406
Direction of View: South
Distance to Project: 0.17 mile
Distance Zone: Near-Foreground

Visual Resources

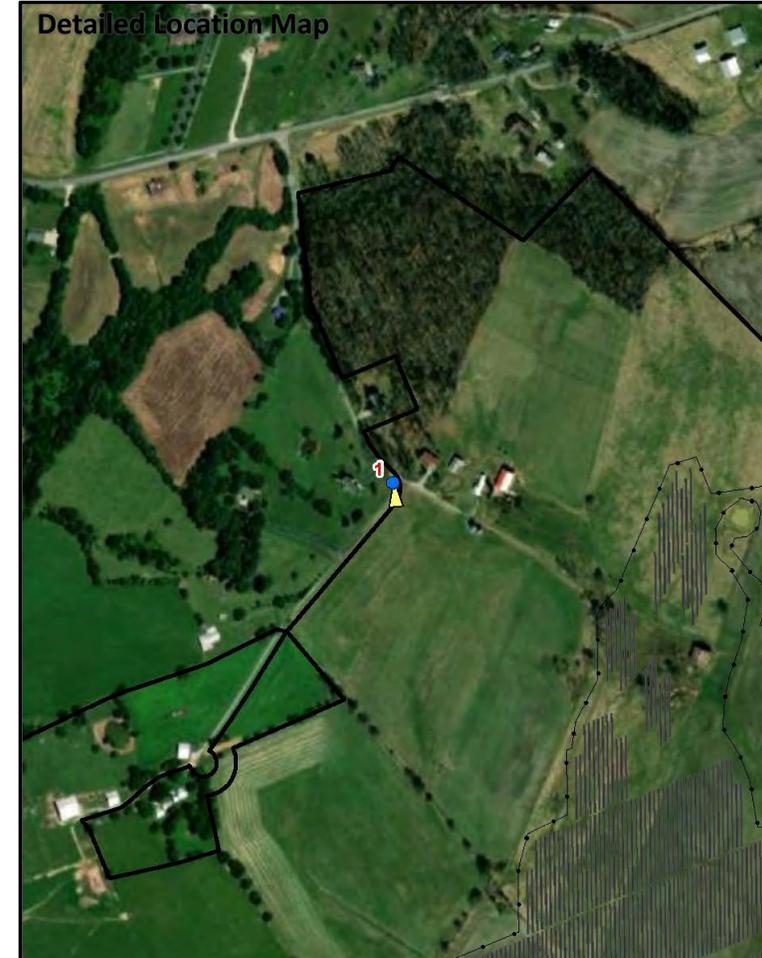
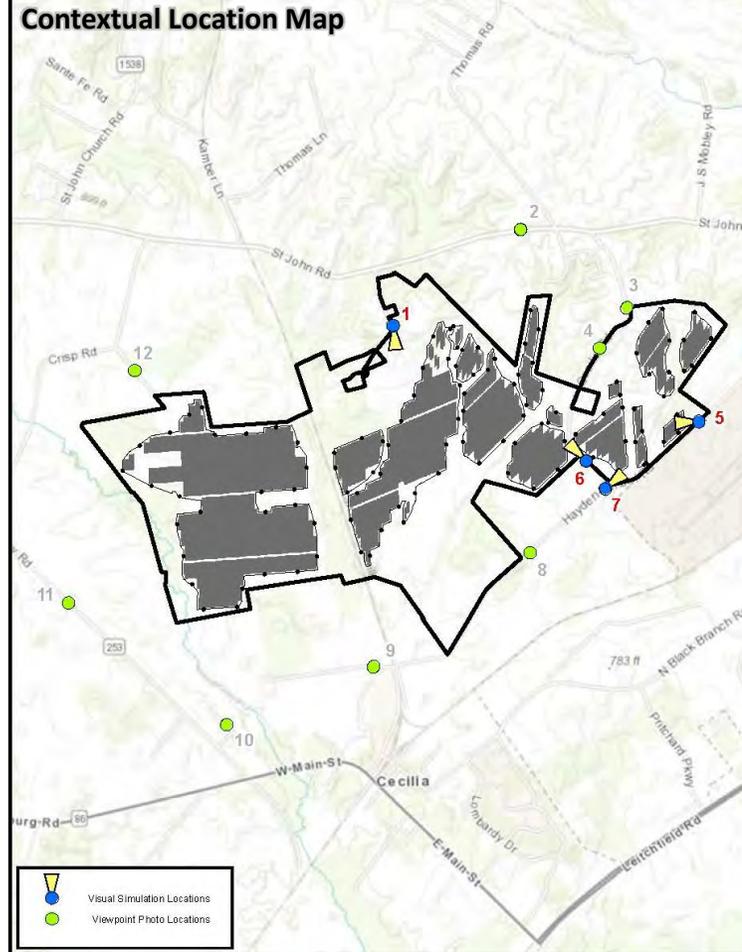
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Photograph Information

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Camera: iPhone 12 Pro Max
Resolution: 4032 x 3024 pixels
Lens Focal Length: 5 mm
Camera Elevation: 5.6 feet

Project Information

Racking Type: Single Axis Tracker
Max Panel Height: 9.0 feet
Total Buildable Area: 563 acres



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Existing Conditions

Telesto Energy Project

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[Visual Resource Assessment](#) | Appendix B, Viewpoint 1 at Goodman Lane – Existing Conditions

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Visual Simulation

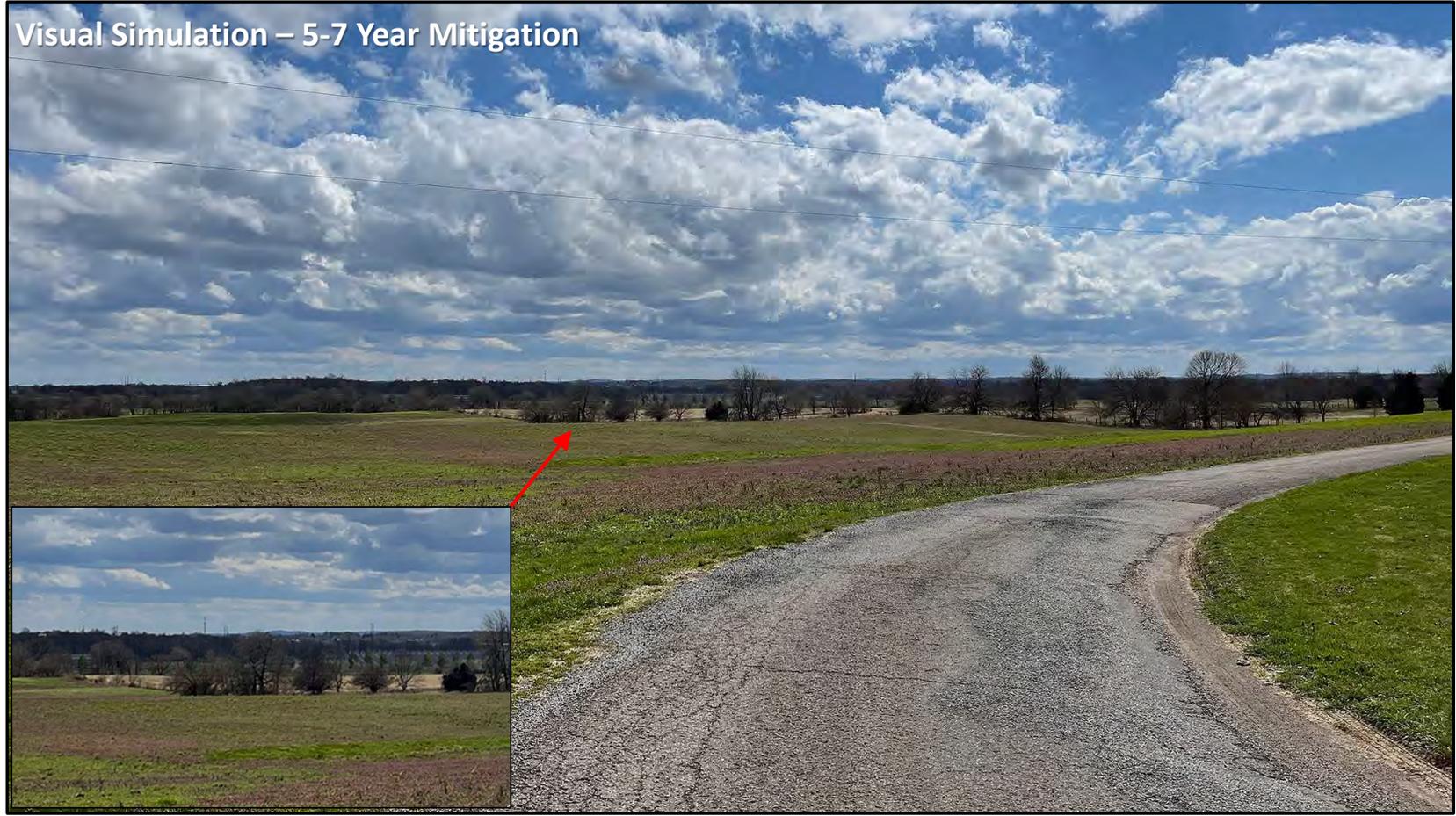
Telesto Energy Project

Hardin County, Kentucky

[Visual Resource Assessment](#) | Appendix B, Viewpoint 1 at Goodman Lane – Visual Simulation

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Telesto Energy Project

Hardin County, Kentucky

[Visual Resource Assessment](#) | Appendix B, Viewpoint 1 at Goodman Lane – Visual Simulation – 5-7 Year Mitigation

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Viewpoint 5 | Elizabethtown

Viewpoint Information

Viewpoint ID: 5
County: Hardin
City/Town: Elizabethtown
Location: Hayden School Road
Coordinates: 37.687094, -85.931075
Direction of View: West
Distance to Project: 0.07 mile
Distance Zone: Near-Foreground

Visual Resources

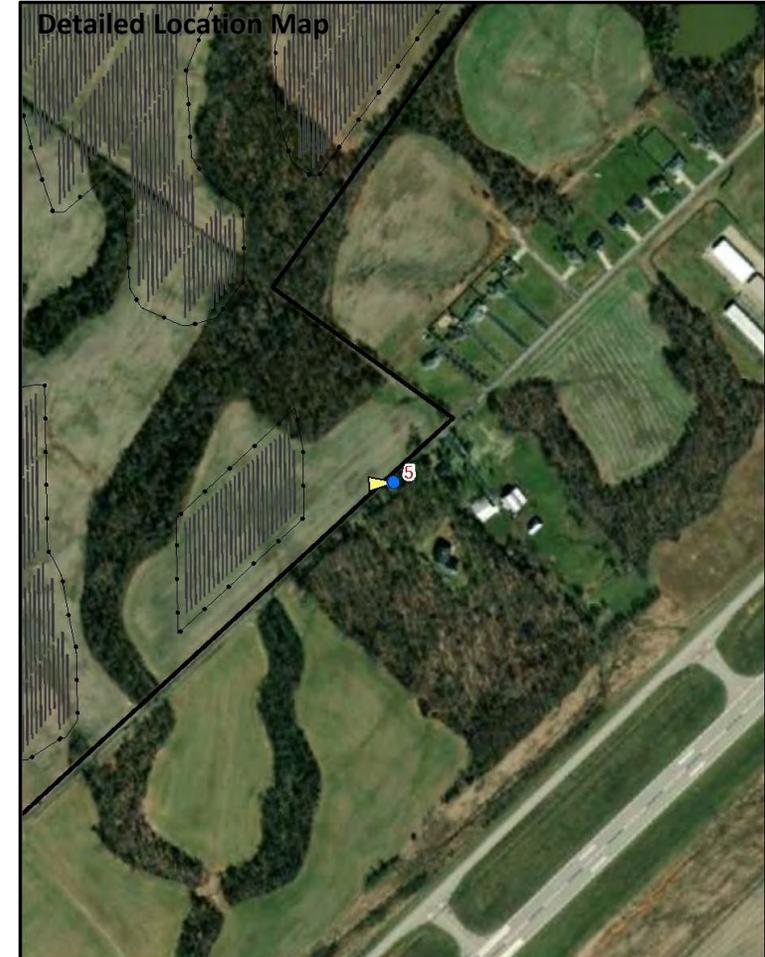
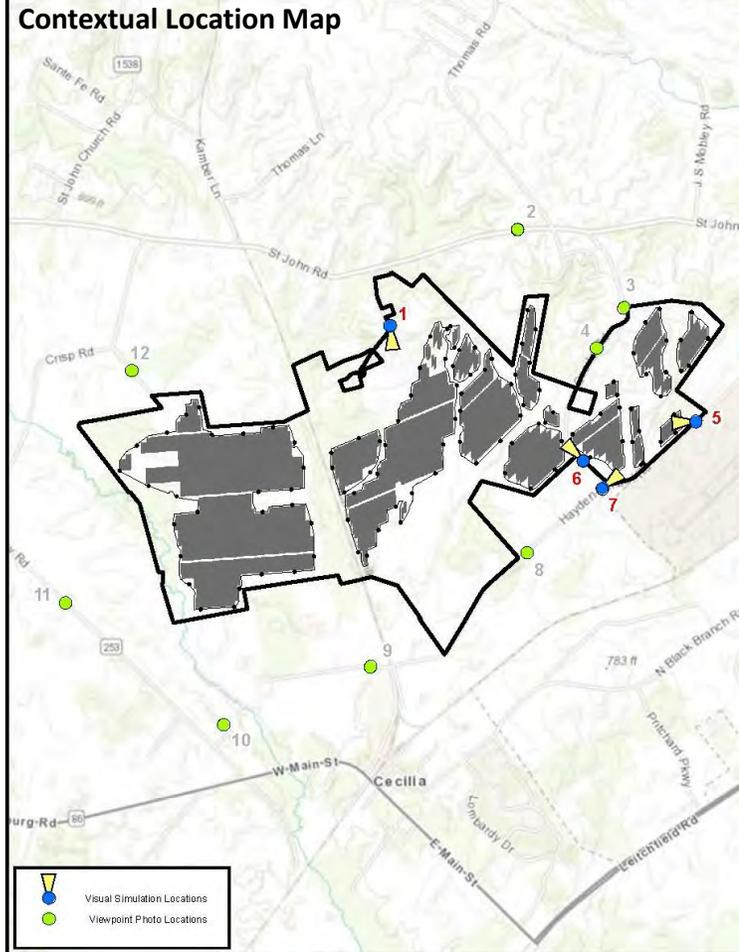
Landscape Type: Farmland
User Group: Resident

Photograph Information

Date Taken: March 23, 2022
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Camera: iPhone 12 Pro Max
Resolution: 4032 x 3024 pixels
Lens Focal Length: 5 mm
Camera Elevation: 5.6 feet

Project Information

Racking Type: Single Axis Tracker
Max Panel Height: 9.0 feet
Total Buildable Area: 563 acres



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Existing Conditions



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Visual Simulation



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Hardin County, Kentucky

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Visual Simulation – 5-7 Year Mitigation

Telesto Energy Project

Hardin County, Kentucky

[Visual Resource Assessment](#) | Appendix B, Viewpoint 5 at Hayden School Road – Visual Simulation – 5-7 Year Mitigation

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Viewpoint 6 | Elizabethtown

Viewpoint Information

Viewpoint ID: 6
County: Hardin
City/Town: Elizabethtown
Location: Cecilia Road
Coordinates: 37.684792, -85.939758
Direction of View: Northwest
Distance to Project: 0.04 mile
Distance Zone: Near-Foreground

Visual Resources

Landscape Type: Farmland
User Group: Resident

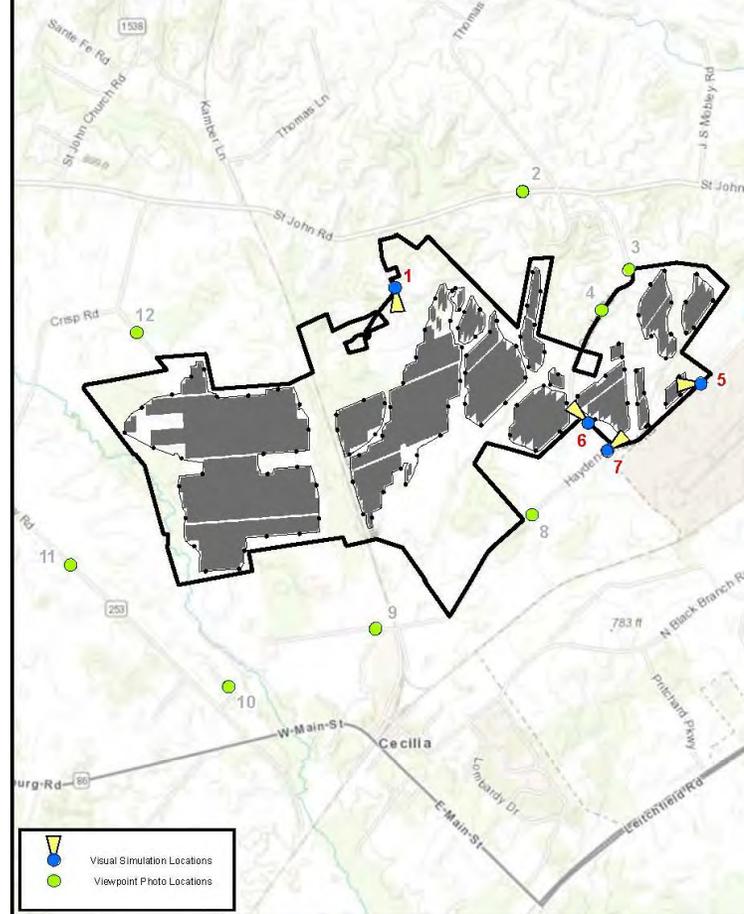
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Camera Elevation: 5.6 feet

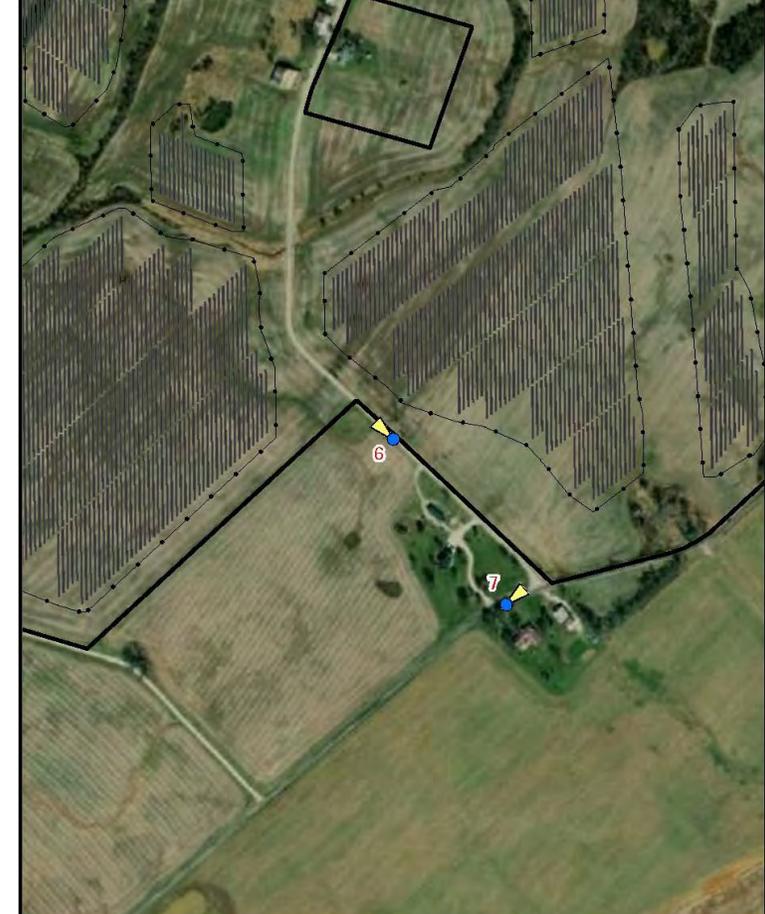
Project Information

Racking Type: Single Axis Tracker
Max Panel Height: 9.0 feet
Total Buildable Area: 563 acres

Contextual Location Map



Detailed Location Map



Telesto Energy Project

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Visual Simulation – 5-7 Year Mitigation

Telesto Energy Project

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[Visual Resource Assessment](#) | Appendix B, Viewpoint 6 at Cecilia Road – Visual Simulation – 5-7 Year Mitigation

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Viewpoint 7 | Elizabethtown

Viewpoint Information

Viewpoint ID: 7
County: Hardin
City/Town: Elizabethtown
Location: Hayden School Road
Coordinates: 37.683125, -85.938378
Direction of View: Northeast
Distance to Project: 0.09 mile
Distance Zone: Near-Foreground

Visual Resources

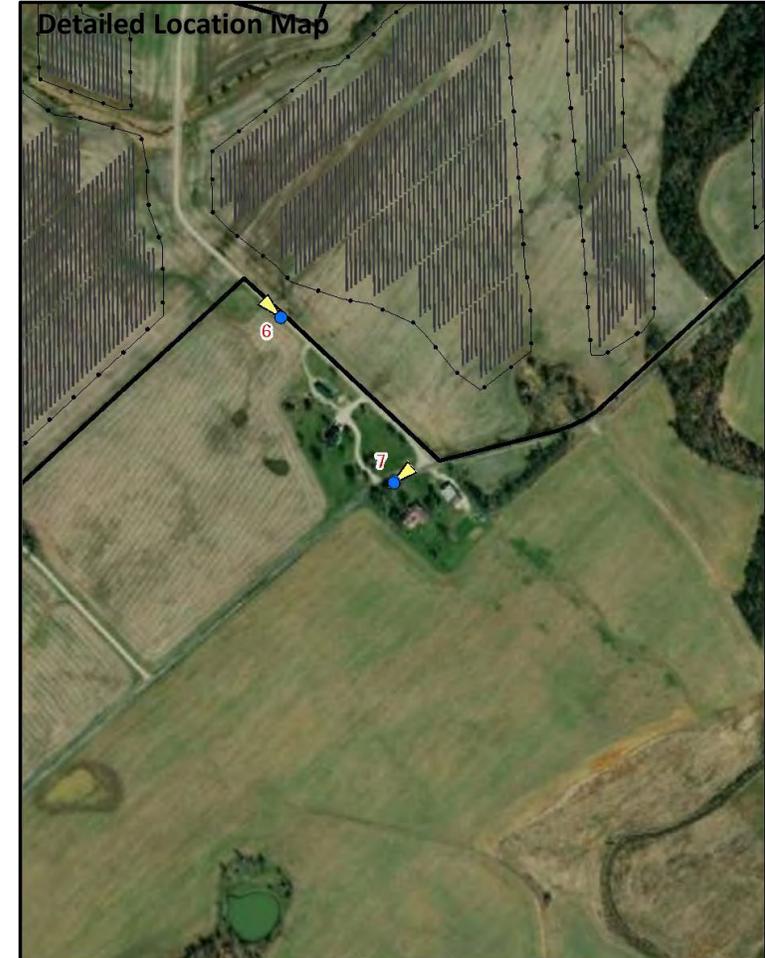
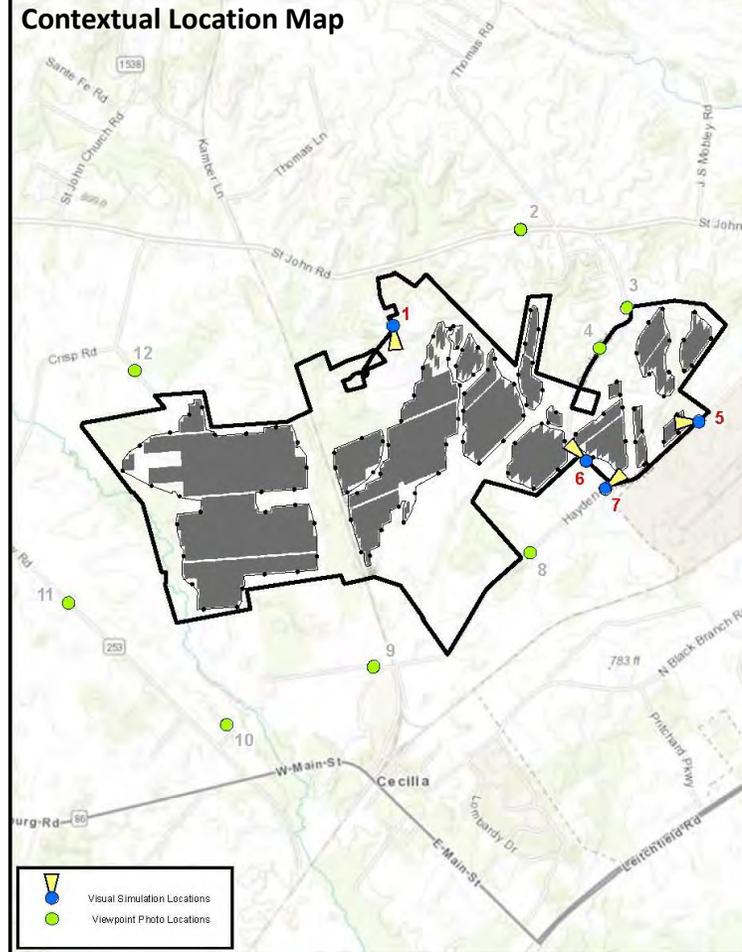
Landscape Type: Farmland
User Group: Resident

Photograph Information

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Time: 2:33 PM
Camera: iPhone 12 Pro Max
Resolution: 4032 x 3024 pixels
Lens Focal Length: 5 mm
Camera Elevation: 5.6 feet

Project Information

Racking Type: Single Axis Tracker
Max Panel Height: 9.0 feet
Total Buildable Area: 563 acres



Telesto Energy Project

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Visual Resource Assessment | Appendix B, Viewpoint 7 at Hayden School Road – Existing Conditions

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Visual Simulation

Telesto Energy Project

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Telesto Energy Project

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Visual Resource Assessment and
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Telesto Energy Project

APPENDIX

C

VISUALLY SENSITIVE RESOURCE
ANALYSIS

Visually Sensitive Resources	Location	Distance	Project Visibility (Viewshed Results)
	County	Miles from Nearest PV Array	+ Visible - Not Visible +/- Partially Visible
			DSM Viewshed (Topography, Structures, Vegetation)
Properties of Historic Significance			
National Historic LandMarks (NHL)			
None within VSA.			
Sites Listed on National or State Registers of Historic Places (NRHP/SRHP)			
Brown Pusey House Community Center	Hardin	4.00	-
First Baptist Church	Hardin	3.94	-
Lincoln Heritage House	Hardin	3.62	-
Abel, Dr., House	Hardin	4.52	-
Arnold, Philip, House	Hardin	4.52	-
Bland, William, House	Hardin	4.29	-
Blue Ball Church	Hardin	4.38	-
Bond, J. Roy, House	Hardin	3.62	-
Chestnut Grove	Hardin	4.76	-
Christ Episcopal Church	Hardin	3.94	-
Embry Chapel Church	Hardin	3.96	-
First Presbyterian Church	Hardin	4.41	-
Hagan House	Hardin	3.99	-
Heller Hotel	Hardin	1.32	-
Helm, Benjamin, House	Hardin	3.67	-
Helm, John B., House	Hardin	3.79	-
Kerrick, W. T., House	Hardin	4.36	-
Larue-Layman House	Hardin	3.98	-
Maple Hill	Hardin	5.12	-
Maplehurst	Hardin	4.48	-
May, David L., House	Hardin	4.05	-
McDougal, Stiles, House	Hardin	3.69	-
Montgomery, William, House	Hardin	4.23	-
Morrison Lodge	Hardin	3.97	-
Penniston House	Hardin	3.62	-
Rawlings, Stephen, House	Hardin	4.64	-
Riney, Zachariah, House	Hardin	3.99	-
Robertson, Samuel, House	Hardin	3.82	-
Smith, George W., House	Hardin	3.68	-
Stark House	Hardin	3.99	-
Thomas, Samuel B., House	Hardin	3.74	-
US Post Office--Elizabethtown	Hardin	3.92	-
Van Meter, Jacob, House	Hardin	4.49	-
Vertrees, Eliza, House	Hardin	3.93	-
Wilson, William, House	Hardin	4.69	-
Wintersmith, Horatio, House	Hardin	3.90	-
Pusey, Dr. Robert B., House	Hardin	3.96	-
State Theatre	Hardin	3.82	-
Elizabethtown Armory	Hardin	4.06	-
Woodard, George, House	Hardin	4.42	-
Hills, Jonathan, House	Hardin	4.00	-
National/State Historic Sites			
None within VSA.			
Historic Bridges			
Lincoln-Haycraft Memorial Bridge Historical Marker	Hardin	4.05	-
OGS Cemeteries			
Duncan Cemetery	Hardin	4.48	-

Visually Sensitive Resources	Location	Distance	Project Visibility (Viewshed Results)
	County	Miles from Nearest PV Array	+ Visible - Not Visible +/- Partially Visible
			DSM Viewshed (Topography, Structures, Vegetation)
Elizabethtown Memorial Gardens	Hardin	1.50	+/-
Helm Cemetery	Hardin	3.32	-
Lewis Cemetery	Hardin	5.02	-
Hardin Memorial Park Cemetery	Hardin	4.28	-
Rineyville Memorial Cemetery	Hardin	4.53	-
Saint James Cemetery	Hardin	4.14	-
Wheatley Cemetery	Hardin	3.28	-
Blue Ball Baptist Cemetery	Hardin	4.41	-
Ridge Spring United Methodist Church Cemetery	Hardin	4.53	-
Kentucky Historic State Markers			
Morgans Second Raid Historical Marker	Hardin	4.16	-
General Custer Historical Marker	Hardin	3.95	-
Lincoln-Haycraft Memorial Bridge Historical Marker	Hardin	4.05	-
Hardin County Historical Marker	Hardin	3.94	-
Elizabethtown Battle Historical Marker	Hardin	4.16	-
Brown-Pusey House Historical Marker	Hardin	3.99	-
Commodore Joshua Barney Historical Marker	Hardin	4.01	-
Severns Valley Baptist Church Historical Marker	Hardin	3.95	-
Sergeant George E Larkin Junior Historical Marker	Hardin	3.95	-
Bond-Washington School Historical Marker	Hardin	4.16	-
Elizabethtown Historical Marker	Hardin	4.16	-
Designated Scenic Resources			
Rivers Designated as National or State Wild, Scenic or Recreational			
None within VSA.			
Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic [(ECL Article 49 Title 1) or equivalent]			
None within VSA.			
Scenic Areas of Statewide Significance [Article 42 of Executive Law]			
None within VSA.			
Other Designated Scenic Resources (Easements, Roads, Districts, and Overlooks)			
None within VSA.			
Public Lands and Recreational Resources			
National Parks, Recreation Areas, Seashores, and/or Forests [16U.S.C. 1c]			
None within VSA.			
National Natural LandMarks [36 CFR Part 62]			
None within VSA.			
National Wildlife Refuges [16 U.S.C. 668dd]			
None within VSA.			
Heritage Areas [Parks, Recreation and Historic Preservation Law Section 35.15]			
None within VSA.			
State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]			
None within VSA.			
State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution]			
None within VSA.			
Wildlife Areas			
None within VSA.			
State Forest			
None within VSA.			
Other State Lands			
None within VSA.			
Designated Trails			
None within VSA.			

Visually Sensitive Resources	Location	Distance	Project Visibility (Viewshed Results)
	County	Miles from Nearest PV Array	+ Visible - Not Visible +/- Partially Visible
			DSM Viewshed (Topography, Structures, Vegetation)
Local Parks and Recreation Areas			
River Road Park	Hardin	2.28	-
Hero's Park	Hardin	1.64	-
Flat Run Veterans Park	Hardin	1.55	-
Conservation Lands/Easements			
KDA PACE-00095	Hardin	1.85	-
KDA PACE-00126	Hardin	0.30	+/-
Named Lakes, Ponds, and Reservoirs			
Buffalo Lake	Hardin	1.79	+/-
Greer Lake	Hardin	1.34	-
Freeman Lake	Hardin	1.30	+/-
Stephensburg Lake	Hardin	1.78	+/-
Dranes	Hardin	1.36	+/-
Hicks Lake	Hardin	0.87	-
High-Use Public Areas			
State, US, and Interstate Highways			
US-31W	Hardin	0.99	-
KY-210	Hardin	1.84	-
KY-220	Hardin	1.55	-
KY-251	Hardin	1.42	-
KY-1357	Hardin	0.12	+/-
KY-1375	Hardin	0.80	-
KY-1538	Hardin	0.37	-
KY-1600	Hardin	0.94	-
KY-1136	Hardin	1.54	-
KY-2802	Hardin	0.90	-
KY-3005	Hardin	0.35	+/-
KY-222	Hardin	1.14	-
KY-361	Hardin	0.86	-
KY-447	Hardin	1.59	-
KY-1904	Hardin	0.71	-
KY-2212	Hardin	1.00	-
KY-253	Hardin	0.14	+/-
KY-567	Hardin	1.90	-
US-62	Hardin	0.53	+/-
WK-9001	Hardin	1.11	+/-
I-65	Hardin	1.63	-
KY-61	Hardin	1.86	-
KY-86	Hardin	0.28	+/-
Cities, Villages			
Elizabethtown	Hardin	0.01	+/-
Radcliff	Hardin	1.58	-
Schools			
Elizabethtown High School	Hardin	4.31	-
Helmwood Heights Elementary School	Hardin	2.84	-
Morningside Elementary School	Hardin	3.79	-
Panther Academy	Hardin	4.34	-
Talton K Stone Middle School	Hardin	3.83	-
Valley View Education Center	Hardin	4.45	-
Elizabethtown Independent District Office	Hardin	3.76	-