

DECOMMISSIONING PLAN AND COST EVALUATION

Ashwood Solar Project | Lyon County, Kentucky

December 2023

Prepared for:

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1.0 Executive Summary

1.1 Introduction

Verdantas LLC (Verdantas) was retained by RWE Renewables Americas, LLC (RWE) to prepare the Ashwood Solar Project Decommissioning Plan. The Ashwood Solar Project ("Project") is a solar-powered electric generation facility planned to consist of arrays of ground-mounted solar panel modules, metal racking system and support piles, underground electric collection cables, inverters, transformers, a substation, solar meteorological stations, a supervisory control and data acquisition ("SCADA") system, electrical interconnect transmission line, and associated access roads (collectively, the "Facility"). The Facility location is Jefferson Township in Lyon County, Kentucky. The Facility is approximately 320 acres and is shown in Appendix A (Site).

Tier 1 modules with a total nominal rating of 88 megawatts (MW) alternating current (AC) are Planned to be used. For the purpose of this decommissioning cost evaluation, Verdantas has evaluated the Facility based on the draft facility design information provided by RWE Renewables Americas, including assuming that 227,881 JA Solar (545-550 watts) W bifacial PV modules will be used. Any changes to the specific number of modules utilized or other minor changes as the Facility reaches final design will not change the overall conclusions of, or decommissioning methods described in this Decommissioning Plan; however, there may be minor changes to the cost estimate included as Appendix B, which will be updated before the financial assurance described in Section 5.0 is implemented. The purpose of the decommissioning cost evaluation was to review the Facility and to make a recommendation to RWE regarding the total cost to retire the Facility at the end of its useful life.

This Decommissioning Plan, including the decommissioning cost evaluation, will be updated once final design is completed prior to construction and every five years from the commencement of construction.

1.2 Results

RWE Renewables Americas estimates that the Facility should have an expected useful life of approximately 40 years. When the project owner determines that the Facility should be retired, this plan will be used for the decommissioning effort. This Decommissioning Plan covers the steps needed to return the Project Area to conditions consistent with those prior to construction of the Facility which includes retirement of the power generating equipment as well as the balance of plant (BOP) facilities. All equipment, structures and supporting components will be removed off-site, with the exception of the underground improvements (i.e., cabling and foundations) which will be removed to five feet below grade, unless greater depth is needed for maintenance or repair of field tile systems.

The decommissioning costs are based on the following general assumptions:

- The access roads and the substation surface will be restored to conditions similar to those prior to construction of the Facility. Depending on plans for post-decommissioning use of the Site, the landowner may choose to retain roads for use following decommissioning. This determination will be made prior to commencement of decommissioning.
- Surface water drainage will be reestablished to the general overall flow conditions prior to construction of the Facility.
- When the equipment, access roads and foundations are removed and the ground

surface restored, final grading will be consistent with agricultural use.

- Access road stream crossings will be left in place for use by the landowner.
- Ground water resources in this area are generally found at a depth well below any foundations for this project. Construction and decommissioning activities are planned to be well above any groundwater resources. During construction, all wetlands not permitted to be impacted will be avoided, and decommissioning activities will also avoid all wetlands not permitted to be impacted. Therefore, there are no anticipated impacts to surface or groundwater resources and wetlands. If information becomes available at a later date that would suggest that these resources would be affected, it will be addressed in the five-year update to this plan.
- All decommissioning work will be conducted under applicable permits and approval as generally outlined within Section 6.0 below.
- This document establishes the estimated costs to decommission the Facility. Estimated salvage values are also provided for reference.
- The schedule for starting the decommissioning activities is within 12 months of the Facility ceasing operations. Decommissioning activities are planned to be completed within 12 months after the end of the useful life of the Facility. Final restoration activities could take up to an additional 6 months depending on seasonal requirements. It is assumed that the decommissioning will occur in one, continuous decommissioning event.
- The estimated decommissioning costs for the Ashwood Solar Project are as represented within Appendix B.

2.0 Project Description

2.1 Project Introduction

The Ashwood Solar Project is planned to consist of large arrays of ground-mounted solar panel modules, metal racking system and support piles, underground electric collection cables, inverters, transformers, a substation, solar meteorological stations, a supervisory control and data acquisition (“SCADA”) system, electrical interconnect transmission line, and associated access roads (collectively, the “Facility”). The Facility location is Lyon County, Kentucky. The Facility is approximately 320 acres and is shown in Appendix A.

2.2 Solar Module Units

The cost evaluation attached as Appendix B is based on the Facility as described by RWE Renewables Americas, which will include 227,881 JA Solar 545 to 550 W bifacial PV modules for a total nominal rating of approximately 123.8 MW direct current (DC) and 87.8 MW AC. The solar panels will be mounted to a metal racking system with piles that will be driven or rotated into the ground in long rows or “arrays”. The Project’s arrays are planned to use a GameChange Fixed Tilt racking system. Fixed-tilt racking will be stationary with each array will run in an east-west direction. Solar panels mounted on the racking will be oriented or “titled” to the south, with the low (southern) end of the panel one (1) to three (3) feet above the ground surface and the high (northern) end of the panel eight (8) to fourteen (14) feet above the ground surface.

2.3 Underground Electric Collection Cables, Inverters and Transformers

The Facility will include approximately 7 miles several of buried collection lines and 26 inverters. Solar panels will be grouped into a series of circuits routing through cable trays on the racking to combiner boxes. Power from the combiner boxes will then be transmitted to DC-to-AC inverters, step up transformers and cabinets containing power control electronics. Cables used for transferring electrical power can be located underground or aboveground. The electrical conversion equipment will be mounted on a prefabricated foundation, such as a metal skid and helical piers, or field fabricated foundations. AC power will be delivered through collection lines to the Substation.

2.4 Substation And Interconnection Transmission Line

The electrical power from the solar panels will be routed to a central electrical Substation (the Collector Substation). The major components of the Collector Substation will be collection line feeders and breakers, electrical bus, main power transformer, high voltage breaker, metering/relaying transformers, disconnect switches, enclosure containing power control electronics and a lightning mast. The Collector Substation will be constructed on a concrete foundation, surrounded by a perimeter fence.

As noted within the Application Volume 1 Attachment H (Interconnection Agreement), an anticipated 161 kV electrical interconnect will be used to connect the Collector Substation to the North Princeton-Livingston County 161 kV transmission line (Point of Interconnect (POI)). The Point of Interconnect is owned and operated by Louisville Gas and Electric/Kentucky Utilities Services Company (LGE-KU).

2.5 Access Roads

Each solar field will have an access road to support construction and allow for vehicle access to facilitate operations, maintenance, repair and replacement of equipment in addition to providing access for emergency response. The project will include up to 4.2 miles of access roads for Facility construction, operation and maintenance. The roads are planned to have a clear width of clear width of 20 feet with treated shoulders. Access roads that serve the Facility will be surfaced with a gravel base.

2.6 Solar Meteorological Stations And Supervisory Control And Data Acquisition (“Scada”) System

The Project will include four meteorological stations, which includes pyranometers, anemometer, wind vane, barometer, rain bucket, temperature probe, other measuring equipment and associated communications equipment. All equipment will be installed on prefabricated foundations and will be up to 15 feet in height and will be fenced and gated.

The Project will also include a single masonry or metal structure that will house SCADA equipment. It will contain computers, communication devices, and other electronic devices to assist in the monitoring and operation of the Facility. The SCADA structure will have electrical service, but will not include offices or be occupied, and will not include water or sewer service. The SCADA structure will be constructed on a poured or pre-fabricated concrete foundation, occupy less than 400 square feet, and be less than 15 feet high.

The SCADA system will also include buried fiber optic cable, co-located with the buried medium-voltage collection system, linking the SCADA structure with sensors and controls located at each inverter, pyranometer, and within the solar array.

3.0 Decommissioning Plan

RWE Renewables Americas estimates the Facility should have an expected useful life of approximately 40 years. Upon the retirement of each portion of the Facility, decommissioning and restoration of the Facility will be performed and managed by qualified contractors who have demonstrated relevant experience. The selected contractor will secure all the required permits, schedule the planned activities, and work with waste management firms to segregate materials that can be reused and recycled from those that must be properly disposed of at licensed disposal facilities that operate in accordance with current applicable federal, state and local laws, rules, regulations and ordinances. Advance notification will be provided to all stakeholders, including landowners, and other relevant agencies prior to any scheduling of decommissioning activities. During decommissioning activities, coordination with the County will be completed to ensure provisions are in place for repair of public roads that are damaged or modified during the decommissioning process.

During decommissioning and restoration activities, necessary environmental protection measures will be implemented. Activities during decommissioning will be comparable to the construction phase, including the use of heavy equipment onsite, preparing staging areas, and restoring areas that were disturbed during work activities. Best management practices regarding erosion and sedimentation controls will be implemented, as well as dust and noise mitigation controls. Additionally, contingency plans will be in place for unforeseen conditions and spills. A project specific Health & Safety Plan (HASP) will be prepared by the respective contractors and be available onsite.

Additionally, contractors shall be obligated to maximize the salvage value for the overall project and all recyclable materials, salvaged and non-salvaged, shall be recycled to the extent practicable.

See below for a description of the individual Facility components and the proposed plan for decommissioning these components. The Facility will be deenergized and isolated from all external electrical lines in coordination with the appropriate utility prior to commencing removal and recycling activities.

3.1 Solar Module Units

All modules will be disconnected, removed from the racking, carefully packaged and transported to a designated location for resale, recycling or disposal. The connecting cables and combiner boxes will be disconnected and removed. The steel racking system supporting the solar modules will be unbolted and disassembled by laborers using standard hand tools and possibly assisted by mechanical equipment. All steel support structures will be completely removed by mechanical equipment and transported offsite for salvage or reuse. Any demolition debris that is not salvageable will be transported offsite to licensed disposal facilities, operating in accordance with current applicable federal, state and local laws, rules, regulations and ordinances. Vehicles used for transport will be legal weight and dimensions. All piles shall be removed by the pull-out method from the Site, and if sections of piles detach during this operation, sections will be removed if they are within 3 feet of the existing ground surface, unless deeper removal is needed for maintenance or repair of field tile systems.

3.2 Underground Electric Connection Cables, Inverters And Transformers

Decommissioning will require dismantling and removal of electrical equipment, including above ground cables, underground cables above 5 feet in depth, inverters and transformers. Buried collection cables more than 5 feet below grade will not be removed, unless deeper removal is needed for maintenance or repair of field tile systems. All electrical equipment will be removed from the Facility and transported offsite for recycling or disposal. Concrete foundations and support pads will be broken up by mechanical equipment and removed from the Site for recycling or disposal. Vehicles used for transport will be legal weight and dimensions, with the exception of some larger electrical equipment that may require special hauling permits. Prior to removal of the transformers, any oil will be pumped out into a separate industry-approved disposal container and sealed to prevent any spillage during storage and/or transportation. It is expected that any oils will be recycled and reused; otherwise, the oils will be disposed of at a licensed disposal facility.

3.3 Substation And Interconnection Transmission Line

The equipment in the Collector Substation and surrounding fencing will be removed from the site and recycled or reused. The underground cabling for the power collection system is assumed to be buried at a depth of greater than three feet, and therefore will be left in place, unless deeper removal is needed for maintenance or repair of field tile systems. The Facility owner will contact the applicable regional transmission organization and interconnection utility prior to decommissioning to manage/coordinate efforts to ensure no disruption to the electrical grid. The POI switching station will be owned by the utility and is not part of this Plan.

3.4 Access Roads

For purposes of this study, it is assumed that all of the access roads will be removed as part of the decommissioning of the Facility. This will include removal of the aggregate surface, geotextile materials and any modified subgrade material. Areas where aggregate surfacing has been removed will be decompacted, filled with controlled fill as needed and topsoil respread. The decommissioned areas, inclusive of the access roads, will be graded to contours consistent with pre-construction topography to ensure suitable surface drainage, and restore drainage patterns. The aggregate will be removed from the Site and reused or properly disposed of. Participating landowners may choose to retain roads for their own use following decommissioning, so prior to decommissioning activities landowners will be directly contacted and their intentions will be properly documented.

3.5 Solar Meteorological Stations and Supervisory Control and Data Acquisition (“Scada”) System

The equipment, prefabricated foundations and surrounding fencing within the Solar Meteorological Stations will be removed by the demolition contractor for recycling or disposal. All fencing will be removed from the Site and recycled or reused.

The structure, equipment, prefabricated foundations and surrounding fencing for the SCADA system will also be removed by the demolition contractor for recycling or disposal. The buried fiber optic cable for the SCADA system is assumed to be buried at a depth of greater than three feet, and therefore will be abandoned in place. All fencing will be removed from the Site and recycled or reused.

4.0 Site Reclamation

Once the removal of all equipment and Site demolition is complete, Site reclamation activities will commence. Agricultural areas will be restored to conditions prior to Site disturbance. The decommissioned areas, inclusive of the access roads, will be final graded consistent with agricultural use to ensure suitable surface drainage and drainage patterns. Soil quality should improve during the life of the project, due to solar facility maintaining vegetative ground cover throughout the life of the Facility. Maintenance during operation would include mowing activities and leaving grass cuttings in place to decompose. The decomposed organic material would then be naturally added to the existing soils. In areas where topsoil was removed and stockpiled during construction, topsoil will be redistributed to provide similar ground cover that was present prior to Site disturbance. Areas disturbed during decommissioning activities will be seeded and mulched to provide vegetative cover to minimize erosion of topsoil. Seed mixes and other materials used will be acquired in quantities sufficient to complete any revegetation work necessary following decommissioning. Ideally, seeding will occur in the fall before first frost or early spring just before the last frost. The average frost-free growing season for the area is mid-April through the end of October. Sources of guidance for seeding and mulching, including watering, mowing, and repairing include the Kentucky Planning and Technical Specifications Manual for Stormwater Pollution and Prevention Plans (KY BMP Manual, 2009 Edition)¹ and Section 212 of the Kentucky Transportation Cabinet, Standard Specification for Road and Bridge Construction. (KYTC Standard Specifications, 2019 Edition)². Prior to preparing for seeding, any areas where the soil has been compacted by decommissioning activities shall be decompacted prior to placing topsoil and preparing the seed bed. Decompaction can be performed with a disk for shallow compaction or a winged subsoiler or straight ripper shank for areas that may have been compacted to deeper depths.

During the operation of the Facility, the ground under all the solar array areas will be vegetated and decommissioning activities will cause minimal surface disturbance to these areas. Because there will be a healthy stand of vegetation prior to decommissioning activities, it is assumed 40 percent of the area under the arrays will not require reclamation. Therefore, for cost estimating purposes, it is assumed that 60 percent of the array areas will require reclamation activities such as decompaction, minimal grading, and seed and mulch. The Site will be monitored for one year after completion of decommissioning activities to ensure successful revegetation and restoration activities.

Any agricultural drainage tiles impacted during the decommissioning activities will be removed or restored to conditions prior to site development. Tile repairs shall be performed, to the extent practical, in accordance with applicable provisions of the current version of the Standard Practice for Subsurface Installation of Corrugated Polyethylene Pipe for Agricultural Drainage or Water Table Control, ASTM F449-02 (2008)³ and USDA NRCS National Engineering Handbook Section 16, Chapter 4, Subsurface Drainage Investigation (January 2008)⁴.

¹https://eec.ky.gov/Environmental-Protection/Forms%20Library/09BMPManual_Final.pdf

²<https://transportation.ky.gov/Construction/Standard%20amd%20Supplemental%20Specifications/Complete%20KYTC%20Standard%20Specifications%20-%202019.pdf>

³<https://www.astm.org/f0449-02r14.html>

⁴https://efotg.sc.egov.usda.gov/references/public/OH/Subsurface_Drain_Investigation_OH-09_CS_2017-01.pdf

5.0 Decommissioning Costs

Based on the results of this evaluation, the estimated decommissioning cost for the Facility was overseen by a Professional Engineer (PE) licensed in the State of Kentucky and is provided in is provided in Appendix B. The estimated salvage values for the Facility are also provided in Appendix B for reference.

RWE and its successors or assigns will provide for financial security to ensure that funds are available to decommission the Facility and restore the land consistent with pre-construction conditions. Prior to the start of commercial operation of the solar electric generation facility, the applicant shall provide performance bonding or a letter of credit for the estimated decommissioning cost for the respective portion of the Facility and maintain the financial security until decommissioning of that respective portion of the Facility is completed in accordance with this plan. Following the start of commercial operation of the solar electric generation facility the cost estimate will be updated every 5 years by an engineer licensed in the State of Kentucky and the bond amount will be adjusted accordingly.

6.0 Decommissioning Schedule and Permits

The schedule for completing the decommissioning is estimated to take no more than 18 months, including up to 12 months for equipment removal and an additional 6 months for seasonal restoration and revegetation activities.

This estimated schedule includes multiple demolition and restoration crews to restore all areas to a condition prior to being disturbed. Essentially all of the land being used by the Facility was previously agricultural lands, so the intended future use of the land following reclamation is for it to return to agricultural use with the specific agricultural use to be at the discretion of the landowner.

The structure demolition and the restoration crew will consist of the following personnel per crew:

Structure Demolition Crew:

- Machine operators;
- Laborers;
- Multiple truck operators for hauling; and
- General Superintendent.

Restoration crew:

- Machine operators;
- Laborers; and
- Multiple truck operators for hauling.

At a minimum, the following permits, plans, and/or approvals will likely be required prior to initiating demolition activities:

- Health & Safety Plan Development;
- Demolition Permit;
- Waste Disposal Plan;
- KPDES General Permit for Storm Water Associated with Construction Activities and a Stormwater Pollution Prevention Plan (SWPPP); and
- Air Monitoring (Dust) Plan/Equipment Mobilization.

While the above list is intended to cover the major permits and approvals that will likely be required, local requirements and changes in regulatory requirements over time may require additional Site-specific permits and/or approvals that may not be listed above. A detailed study is recommended as part of the normal pre-demolition planning activities to confirm the exact permitting requirements that may be needed to execute the work.

7.0 Decommissioning Cost Assumptions

In addition to the project scope understandings and assumptions described in Sections 3 and 4, the following general assumptions were made as the basis for the cost estimates:

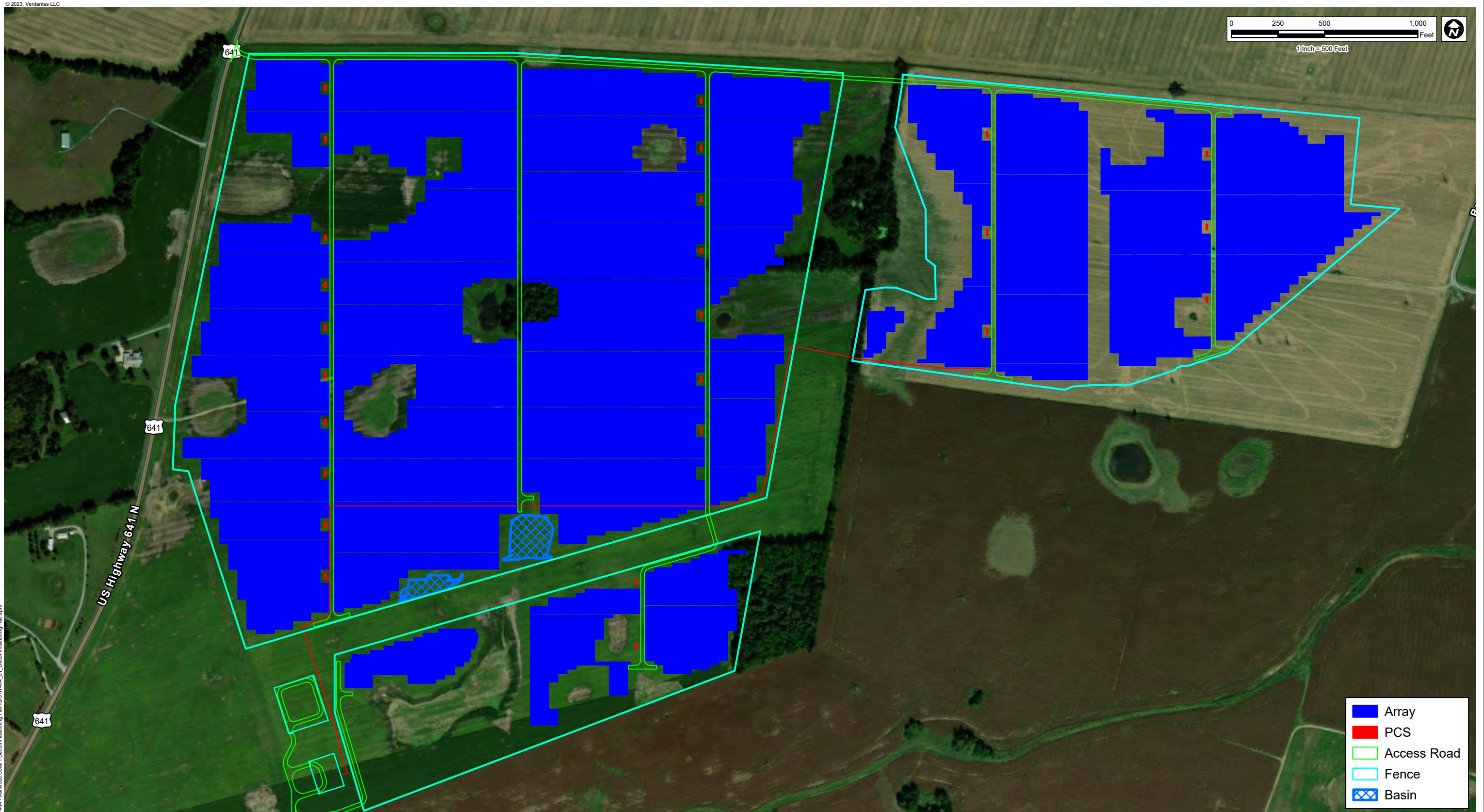
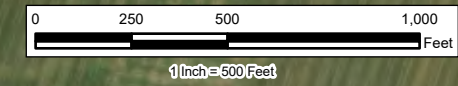
1. The cost estimate is based on limited design information provided by the client at the time of preparation of this plan and therefore a 10% contingency has been included.
2. The cost estimate is based upon typical industry and market conditions as of the date of this estimate without consideration of salvage values. Natural disasters, homeland security escalation, inflation, financing, and other unforeseen circumstances can cause sudden increases in material and labor costs.
3. Salvage value is excluded.
4. It is recognized that neither Verdantas LLC nor its Client has control over the cost of labor, materials or equipment, or over the Contractor's methods of determining bid prices and competitive bidding or negotiating conditions.
5. The costs were based on a standard work shift and does not include premiums for work required to be completed during off hours or weekends.
6. The estimate does not include contractor standby time.
7. The estimate assumes that contractors will have full access to all work areas at the scheduled time of work and does not include delays associated with gaining access.
8. No hazardous construction material abatement is required.
9. Cleanup of contaminated soils, hazardous materials, or other conditions present on-site having a negative environmental impact are not anticipated; therefore, no environmental cleanup costs have been included.
10. During decommissioning efforts, public road improvements were not anticipated due to legal load limits (weight, size) or special hauling permits being adhered to.

8.0 Standard of Care and Limitations

Verdantas has performed its services using that degree of care and skill ordinarily exercised under similar conditions by reputable members of its profession practicing in the same or similar locality at the time of service. No other warranty, express or implied, is made or intended by our oral or written reports. The work did not attempt to evaluate past or present compliance with federal, state, or local environmental laws or regulations. Verdantas makes no guarantees regarding the completeness or accuracy of any information obtained from public or private files or information provided by subcontractors.

Appendix A

Preliminary Site Layout



- Array
- PCS
- Access Road
- Fence
- Basin

Note:
The aerial photo was acquired through the Esri Imagery Web Service.
Aerial photography dated 9/20/2016.



DISCLAIMER:
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December 2023	
Decommissioning Plan Ashwood Solar Project	
Preliminary Site Layout	
Lyon County, Kentucky	
Figure 1	

Appendix B

Decommissioning Cost Evaluation

**Ashwood Solar Project
Lyon County, Kentucky
Decommissioning Cost Evaluation**

<u>Description</u>	<u>Duration (weeks)</u>	<u>Cost Estimate</u>
Mobilization/Demobilization/ General Conditions	32	\$185,000
Health & Safety	32	\$15,000
SWPPP & Dust Control	32	\$275,000
Removal of Solar Facility Equipment	24	\$2,554,725
Site Demolition	4	\$256,600
Site Reclamation	4	\$656,825
Totals excluding 10% Contingency		\$3,943,150
10% Contingency		\$ 394,315
Total inclusive of 10% Contingency		\$4,337,465

**Ashwood Solar Project
Lyon County, Kentucky
Decommissioning Salvage Value Evaluation**

<u>Description</u>	<u>Estimated Salvage Value</u>
	<u>Cost</u>
Mobilization/Demobilization/ General Conditions	\$0
Health & Safety	\$0
SWPPP & Dust Control	\$0
Removal of Solar Facility Equipment	\$(2,702,075)
Removal of BESS Facility Equipment	\$0
Site Demolition	\$(21,800)
Site Reclamation	\$0
Total excluding 10% Contingency	\$2,723,875
10% Contingency	\$272,388
Total inclusive of 10% Contingency	\$2,996,263