

Appendix J

DECOMMISSIONING PLAN

Barrelhead Solar, LLC

Wayne County, Kentucky

**Decommissioning Plan
Barrelhead Solar Project
Wayne County, Kentucky**



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**DECOMMISSIONING PLAN
BARRELHEAD SOLAR PROJECT, WAYNE COUNTY, KENTUCKY**

This document entitled Decommissioning Plan, Barrelhead Solar Project was prepared by Stantec Consulting Services Inc. ("Stantec") for the use of Barrelhead Solar, LLC a subsidiary of Birch Creek Development, LLC (the "Client"). The material in this document reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in this document are based on conditions and information existing at the time this document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others.



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1.0 INTRODUCTION

Barrelhead Solar, LLC (Barrelhead) a subsidiary of Birch Creek Development, LLC (the “Client”), is proposing to construct the Barrelhead Solar Project (the “Project”) located to the north of Alpha in Wayne County, Kentucky. The Project will occupy approximately 304 acres of land which will be surrounded by perimeter fencing and will have a generating capacity of up to 54.0 megawatts (MW) alternating current (AC). Major components of the Project include bi-facial solar modules, a racking system, inverter stations, access roads, perimeter fence, a Project substation, and an overhead transmission line.

This Decommissioning Plan (Plan) provides a description of the decommissioning and restoration phase of the Project. Start-of-construction is planned for late 2027, with a projected Commercial Operation Date in late 2028. The decommissioning phase is assumed to include the removal of Project facilities as listed in Section 1.1 and shown in Figure 1. This Plan complies with requirements stated within the Kentucky Revised Statutes (KRS) Chapter 278, Section 706.

This Plan includes an overview of the primary decommissioning Project activities, including the dismantling and removal of facilities, and subsequent restoration of land. A summary of estimated costs and revenues associated with decommissioning the Project are included in Section 4.0. The summary statistics and estimates provided are based on a 54.0-MW_[AC] Project array design.

1.1 SOLAR PROJECT COMPONENTS

The main components of the Project include:

- Solar modules and associated above ground cabling
- Racking system and steel piles
- Inverter/transformer stations
- Site access and internal roads
- Perimeter fencing
- Below ground electrical cabling and conduits to a depth of three feet (36 inches)
- Project substation
- Overhead transmission line

1.2 TRIGGERING EVENTS AND EXPECTED LIFETIME OF PROJECT

Per the KRS, Project decommissioning activities must be completed within eighteen (18) months of the date that the facility ceases to produce electricity for sale. Monitoring and site restoration will extend beyond this period to ensure successful revegetation and rehabilitation.

If properly maintained, the expected lifetime of a utility-scale solar module is approximately 40 years with an opportunity for a project lifetime of more than 40 years with equipment replacement and repowering. Depending on market conditions and project viability, solar arrays may be retrofitted with updated components (e.g., modules, racking system, etc.) to extend the life of a project. In the event that the facility

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is not retrofitted, or at the end of the Project's useful life, the solar arrays and associated components will be decommissioned and removed from the Project site. During the Project's useful life, solar modules that are replaced or discarded will be removed from the site within 90 days, unless an extension has been granted by the secretary of the Kentucky Energy and Environment Cabinet ("Secretary").

The value of the individual components of the solar facility will vary with time. In general, the highest component value would be expected at the time of construction with declining value over the life of the Project. Over most of the life of the Project, components such as the solar modules could be sold in the wholesale market for reuse or refurbishment. As efficiency and power production of the modules decreases due to aging and/or weathering, the resale value will decline accordingly. Secondary markets for used solar components include other utility scale solar facilities with similar designs that may require replacement equipment due to damage or normal wear over time; or other buyers (e.g., developers, consumers) that are willing to accept a slightly lower power output in return for a significantly lower price point when compared to new equipment.

Components of the facility that have resale value may be sold in the wholesale market. Components with no wholesale value will be salvaged and sold as scrap for recycling or disposed of at an approved offsite licensed solid waste disposal facility. Decommissioning activities will include removal of the solar arrays and associated components as listed in Section 1.1 and described in Section 2.0.

1.3 DECOMMISSIONING SEQUENCE

The KRS 224.10-285 states that decommissioning activities will be completed within 18 months of the Project ceasing to produce electricity for sale unless the deadline has been extended by the secretary. Monitoring and site restoration may extend beyond this period to ensure successful revegetation and rehabilitation. The anticipated sequence of decommissioning and removal is described below; however, overlap of activities is expected.

- Reinforce access roads, if needed, and prepare site for component removal
- Install temporary erosion control fencing and best management practices (BMPs) to protect sensitive resources
- De-energize solar arrays
- Dismantle modules and above ground wiring
- Remove racking equipment and piles
- Remove inverter stations, along with support piers and piles
- Remove above and below-ground electrical cables to a depth of 36 inches
- Remove perimeter fencing
- Remove access and internal roads and grade site, as needed
- Remove substation and overhead transmission, if decommissioned
- De-compact subsoils (if required), and restore to allow for a substantially similar land use as it was prior to commencement of Project construction.

2.0 PROJECT COMPONENTS AND DECOMMISSIONING ACTIVITIES

2.1 OVERVIEW OF SOLAR FACILITY SYSTEM

Barrelhead anticipates utilizing approximately 97,552 Canadian Solar modules, with a total generating capacity of approximately 70.2 MW direct current (DC) converting to 54.0 MW_[AC] at the Point of Interconnection (POI). The Project area encompasses approximately 304 acres surrounded by perimeter fencing. The land within the perimeter fencing is predominantly rolling hills located on agricultural land with some forest land.

Foundations, steel piles, electric cabling, and conduit will be removed up to a minimum depth of 36 inches (3 feet) beneath the surface. Access roads and fence may be left in place if requested and/or agreed to by the landowner; however, for purposes of this assessment, all access roads and fencing are assumed to be removed. Barrelhead will communicate with the appropriate local agency to coordinate the repair of public roads that are damaged or modified during the decommissioning and reclamation process. Barrelhead will coordinate with appropriate federal, state, and local agencies for necessary permit approvals prior to decommissioning activities.

Estimated quantities of materials to be removed and salvaged or disposed of are included in this section. Most of the materials described have salvage value, although there are some components that will likely have none at the time of decommissioning. All recyclable materials, salvaged and non-salvage, will be recycled to the extent possible. All other non-recyclable waste materials will be disposed of in accordance with state and federal law in a licensed solid waste facility. Table 1 presents a summary of the primary components of the Project included in this decommissioning plan.

Table 1 Primary Components of Project to be Decommissioned

Component	Quantity	Unit of Measure
Solar modules (approximate)	97,552	Each
Racking system (112-module equivalent rack)	436	Each
Steel piles (solar module racks)	3,924	Each
Inverter/transformer stations	15	Each
Steel piles (Inverter stations)	180	Each
Perimeter fencing (approximate)	24,000	Linear Foot
Access roads (approximate)	15,000	Linear Foot
Electrical cables and conduits	13,507	Linear Foot
Substation (1 transformer)	1	Each
Overhead transmission line	0.65	Linear Mile

2.2 SOLAR MODULES

Statistics and estimates provided in this Plan are based on the Canadian Solar CS7N-720TB-AG 720-watt or similar bifacial module for the Project. The module assembly (with frame) has a total weight of approximately 83.3 pounds and are approximately 93.9 inches by 51.3 inches in size. The modules are

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mainly comprised of non-metallic materials such as silicon, tempered glass, plastic, and epoxies, with an anodized aluminum alloy frame.

At the time of decommissioning, module components in working condition may be refurbished and sold in a secondary market yielding greater revenue than selling as salvage material. The estimates in this report have been calculated using a conservative approach, considering revenue from salvage only, rather than resale of the modules.

2.3 RACKING SYSTEM AND SUPPORT

The solar modules will be mounted on a two-in-portrait racking system. Each full rack is expected to be approximately 245 feet in length and will support approximately 112 solar modules. Smaller racks may be employed at the edges of the layout to efficiently utilize available space. The racking system is mainly comprised of galvanized steel; steel piles that support the system are assumed to be comprised of structural steel.

The solar arrays will be deactivated from the surrounding electrical system and made safe for disassembly. Electronic components, and internal electrical wiring will be removed and salvaged. The steel piles will be removed to a minimum depth of three (3) feet below the surface. The supports, racking system, and piles contain salvageable materials which can be sold to provide revenue to offset the decommissioning costs.

2.4 INVERTER STATIONS

The Inverter stations are located within the array and will sit on skids with concrete piers or steel piles. be supported using steel pile. The inverter and transformer stations will be deactivated, disassembled, and removed. Depending on its condition, the equipment may be sold for refurbishment and re-use. If not re-used, they will be salvaged or disposed of at an approved solid waste management facility. Piers and piles will be removed to a minimum depth of three feet below the surface. Oils and lubricants will be collected and disposed of at a licensed facility.

2.5 ELECTRICAL CABLING AND CONDUITS

The Project's underground electrical collection system will be placed at a depth of three feet (36 inches) or less below the ground surface. Cabling and conduit above ground and up to three feet below the ground surface will be removed and salvaged, while cable located greater than three feet below the surface will be abandoned in place. If the salvage value of cable exceeds the removal cost, cable buried deeper than three feet may be removed in decommissioning.

2.6 PROJECT SUBSTATION AND ABOVE GROUND TRANSMISSION TIE-IN LINE

A substation will be constructed as part of the Project with a footprint of approximately 0.52-acres. The substation will contain within its perimeter a gravel pad, one power transformer and footings, electrical control house and concrete foundations, as needed. A dedicated 69 kV overhead transmission tie-in line connects the Project substation to the proposed switching substation.

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The Project substation and transmission line are considered “interconnection and other facilities” as described in 2023 KRS 278.706 and thus, will remain in place unless otherwise requested by the landowner. If the landowner requests that the facilities will be removed, the land will be restored to a substantially similar state as it was prior to commencement of construction of the Project.

If decommissioned, the substation transformer may be sold for re-use or salvage. Components of the substation that cannot be salvaged will be transported off-site for disposal at an approved waste management facility. Foundations and footings will be demolished and removed.

2.7 PERIMETER FENCING AND ACCESS ROADS

The Project site will include an approximately seven-foot-high chain link fence surrounding the perimeter of each array site. The fence will be approximately 24,000 feet (4.5 miles) in length. Near the end of the decommissioning process, the fence fabric, poles, and foundations will be removed and sold for salvage or recycled.

A network of access roads will allow access to solar facility equipment. The internal access roads will be composed of aggregate approximately eight inches in depth and 15,000 feet (2.84 miles) in length. The internal access road lengths may change with the final Project design. Access roads may be left in place if requested and/or agreed to by the landowner. To be conservative, the decommissioning estimate assumes that all internal access roads will be removed.

During installation of the Project site access roads, the native subgrade will be compacted, and geogrid will be placed beneath the gravel for the entire length of the access road. This plan assumes installation of up to eight inches of aggregate base materials over geogrid. The estimated quantity of these materials is provided in Table 2.

Table 2 Typical Access Road Construction Materials

Item	Quantity	Unit
Gravel or granular fill; eight-inch thick	4,445	Cubic Yards
Geogrid	20,000	Square Yards

Decommissioning activities include the removal and stockpiling of aggregate materials on site for salvage preparation. Underlying geogrid will also be removed during the decommissioning process. Geogrid that is easily separated from the aggregate during excavation will be disposed of in an approved solid waste disposal facility. Geogrid that remains with the aggregate will be sorted out at the processing site and properly disposed of. Following removal of aggregate and geogrid, the access road areas will be graded, de-compacted with deep ripper or chisel plow (ripped to 18 inches), backfilled with native subsoil and topsoil, as needed, and the land returned to a substantially similar state as it was prior to the commencement of construction of the Project.

3.0 LAND USE AND ENVIRONMENT

3.1 AGRICULTURAL LAND USE

The Project site topography is gently rolling and is predominantly located on land currently utilized for agricultural purposes. The Project area will be returned to a substantially similar state as it was prior to the commencement of construction.

3.2 RESTORATION AND REVEGETATION

Soils compacted during de-construction activities will be de-compacted, as necessary. County drains will be avoided. If present, private drain tiles that affect drainage of multiple parcels that were not avoided, rerouted, or repaired during construction and have been damaged will be repaired or replaced, as needed, in order to maintain appropriate drainage. Topsoil will be placed on disturbed areas, as needed, and seeded with appropriate vegetation in coordination with landowners. Restored areas will be revegetated in compliance with applicable laws and regulations in place at the time of decommissioning.

3.3 SURFACE WATER DRAINAGE AND CONTROL

As previously described, the proposed Project area is predominately agricultural land with gently rolling topography. The Project facilities are being sited to avoid wetlands, waterways, and drainage ditches to the extent practicable.

Surface water conditions at the Project site will be reassessed prior to the decommissioning phase. Barrelhead will obtain the required water quality permits from the Kentucky Energy and Environment Cabinet (KEEC) and the U.S. Army Corps of Engineers (USACE), as needed, prior to decommissioning the Project. Required construction stormwater permits will also be obtained, and a Stormwater Pollution Prevention Plan (SWPPP) prepared describing the protection needed to reflect conditions present at the time of decommissioning. Best Management Practices (BMPs) may include enhancement of construction entrances, temporary seeding, permanent seeding, mulching (in non-agricultural areas), erosion control matting, silt fence, filter berms, and filter socks.

3.4 MAJOR EQUIPMENT REQUIRED FOR DECOMMISSIONING

The activities involved in decommissioning the Project include removal of the Project components, including but not limited to solar modules, racking system, foundations and piles, inverters, perimeter fence, access roads, and electrical cabling and conduits located at three feet or less below the surface grade of the land. Restoration activities include back-filling of pile and foundation sites; de-compaction of subsoils; grading of surfaces to pre-construction land contours; and revegetation of the disturbed areas.

Equipment required for the decommissioning activities is similar to what is needed to construct the solar facility and may include, but is not limited to: small cranes, low ground pressure (LGP) track mounted excavators, backhoes, LGP track bulldozers and dump trucks, front-end loaders, deep rippers, water trucks,

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disc plows and tractors to restore subgrade conditions, and ancillary equipment. Standard dump trucks may be used to transport material removed from the site to disposal facilities.

4.0 DECOMMISSIONING COST ESTIMATE SUMMARY

Expenses associated with decommissioning the Project will be dependent on labor costs at the time of decommissioning. For the purposes of this report approximate 2025 market values were used to estimate labor expenses. Fluctuation and inflation of the labor costs were not factored into the estimates.

The value of the individual components of the solar facility will vary with time. In general, the highest component value would be expected at the time of construction with declining value over the life of the Project. Over most of the life of the Project, components such as the solar modules could be sold in the wholesale market for reuse or refurbishment. As efficiency and power production of the modules decrease due to aging and/or weathering, the resale value will decline accordingly. Secondary markets for used solar components include other utility scale solar facilities with similar designs that may require replacement equipment due to damage or normal wear over time; or other buyers (e.g., developers, consumers) that are willing to accept a slightly lower power output in return for a significantly lower price point when compared to new equipment.

4.1 DECOMMISSIONING EXPENSES

During decommissioning, the Project will incur costs associated with disposal of components not sold for salvage, including materials which will be disposed of at a licensed facility, as required. Decommissioning costs also include backfilling, grading, and restoration of the proposed Project site as described in Section 3.0. Table 3 summarizes the estimates for decommissioning activities associated with the major components of the Project. Costs are based on an approximately 70.2 MW_[DC] site design, converting to 54.0 MW_[AC].

Table 3 Estimated Decommissioning Expenses

Activity	Unit	Quantity	Cost per Unit	Total
Overhead and management (includes estimated permitting required)	Lump Sum	1	\$129,200	\$129,200
Solar modules; disassembly and removal	Each	97,552	\$5.30	\$517,026
Racking system disassembly and removal	Each	436	\$700	\$305,200
Steel pile/racks	Each	3,924	\$14.60	\$57,290
Inverter stations	Each	15	\$1,930	\$28,950
Steel pile/inverters	Each	180	\$54.20	\$9,756
Remove Buried Cable	Linear Feet	13,507	\$0.93	\$12,562
Access road excavation and removal	Lump Sum	1	\$73,600	\$73,600
Perimeter fence removal	Linear Feet	24,000	\$4.70	\$112,800
Topsoil replacement and rehabilitation of site	Lump Sum	1	\$175,000	\$175,000

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Activity	Unit	Quantity	Cost per Unit	Total
Total Estimated Decommissioning Cost				\$1,421,384

4.2 POTENTIAL DECOMMISSIONING REVENUES

Revenue from decommissioning the Project will be realized through the sale of the facility components and construction materials. As previously described, the value of the decommissioned components will be higher in the early stages of the Project and decline over time. Resale of components such as solar modules is expected to be greater than salvage (i.e., scrap) value for most of the life of the Project, as described below. For the purposes of this Plan, only estimated salvage values were considered in net revenue calculations, as this is the more conservative estimate strategy. Modules and other solar facility components can be sold within a secondary market for re-use. A current sampling of reused solar modules indicates a wide range of pricing depending on age and condition (\$0.10 to \$0.30 per watt). Future pricing of solar modules is difficult to predict at this time, due to the relatively young age of the market, changes to solar panel technology, and the ever-increasing product demand. A conservative estimation of the value of solar modules at \$0.10 per watt would yield approximately \$7,020,000. Increased costs of removal, when preparing for resale versus salvage, would be expected in order to preserve the integrity of the modules; however, the net revenue would be substantially higher than the estimated salvage value, thus offsetting higher removal cost.

The resale value of components such as the module racks may decline more quickly; however, the salvage value of the steel that makes up a large portion of the racks is expected to stay at or above the value used in this report.

The market value of steel and other materials fluctuates daily and has varied widely over the past five years. Salvage value estimates were based on an approximate five-year-average price of steel and copper derived from sources including on-line recycling companies and United States Geological Survey (USGS) commodity summaries. The price used to value the steel used in this report is \$273 per metric ton; aluminum at \$0.40 per pound; silicon at \$0.40 per pound; and glass at \$0.05 per pound.

The main material of the racking system and piles is assumed to be salvageable steel. The main components of the solar modules are glass and silicon with aluminum framing. A 50 percent recovery rate was assumed for all module components, due to the processing required to separate the module components. Alternative and more efficient methods of recycling solar modules are anticipated before this Project is decommissioned, given the large number of solar facilities that are currently being developed. Table 4 summarizes the potential salvage value for the solar array components and construction materials.

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Table 4 Estimated Decommissioning Revenues

Item	Unit of Measurement	Quantity per Unit	Salvage Price per Unit	Total Salvage Price per Item	Number of Items	Total
Modules - Silicon	Pounds per Module	2.1	\$0.40	\$0.840	97,552	\$81,944
Modules – Aluminum	Pounds per Module	3.3	\$0.40	\$1.320	97,552	\$128,769
Modules – Glass	Pounds per Module	31.3	\$0.05	\$1.565	97,552	\$152,669
Racking System and Posts	Metric tons per MW _[DC]	32.0	\$273	\$8,736	70.2	\$613,267
Total Potential Revenue (considering salvage values)					\$976,649	

* Revenue based on salvage value only. Revenue from used modules at \$0.10 per watt could raise \$7,020,000 as resale versus the estimated salvage revenue.

4.3 DECOMMISSIONING COST SUMMARY

Table 5 provides a summary of the net estimated cost to decommission the Project, using the information detailed in Sections 4.1 and 4.2. Estimates are based on early 2025 prices, with no market fluctuations or inflation considered.

Table 5 Net Decommissioning Cost Summary

Item	(Cost)/Revenue
Decommissioning Expenses	(\$1,421,384)
Potential Revenue – salvage value of module components and recoverable materials	\$976,649
Net Decommissioning (Cost)/Revenue	(\$444,735)

4.4 FINANCIAL ASSURANCE

In compliance with the Kentucky Revised Statutes 278.706, Barrelhead is providing this decommissioning plan. A bond or other similar security for the net present value of the total estimated cost of completing the decommissioning plan shall be provided to the Kentucky Energy and Environment Cabinet as the primary beneficiary. The bond or other similar security shall provide that at least thirty (30) days prior to its cancellation or lapse, the surety shall notify the applicant, its successor or assign, each landowner, the Kentucky Energy and Environment Cabinet, and the county or city in which the facility is located of the impending cancellation or lapse. The notice shall specify the reason for the cancellation or lapse and

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provide any of the parties, either jointly or separately, the opportunity to cure the cancellation or lapse prior to it becoming effective. The applicant, its successor, or its assign shall be responsible for all costs incurred by all parties to cure the cancellation or lapse of the bond. Each landowner, or the Kentucky Energy and Environment Cabinet with the approval of each landowner, may make a demand on the bond and initiate and complete the decommissioning plan. The decommissioning plan and cost estimate shall be reviewed and updated every five years, submitted to the Kentucky Energy and Environment Cabinet and Wayne County for approval, and the security revised as appropriate based upon the revised cost estimate at Barrelhead Solar, LLC expense.

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Figure 1 Project Layout

