

A DECOMMISSIONING COST ESTIMATE NARRATIVE FOR

# Posey Solar Project

Posey County, IN

JULY 21, 2022

PREPARED FOR:



PREPARED BY:

**Westwood**

# Decommissioning Cost Estimate Narrative

**Posey Solar Project**

Posey County, IN

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## 1.0 Introduction / Project Description

This Decommissioning Cost Estimate Narrative (“Narrative”) has been prepared for the Posey Solar, LLC (“Owner”) in accordance with the Posey County Solar and Wind Ordinance Section 153.124.03(E). The purpose of this Narrative is to describe the means and methods that have been assumed for the estimate of the Removal Costs and salvage value associated with the removal of all structures, foundations, underground cables, and equipment, and reclamation and restoration of the land altered during the construction and operation of the solar project to its predevelopment condition to the extent feasible.

The estimate of the Removal Costs and salvage value for the Posey Solar Project (“Project”) have been based on a 233-Megawatt (MW) alternating current (298-MW direct current) solar power generation project proposed by Arevon Energy in Posey County, IN<sup>1</sup>. Upon completion, the Project will comprise a solar array, consisting of ground-mounted photovoltaic panels and electrical support equipment, underground and overhead collection lines, a substation, an operation and maintenance (O&M) facility, access roads, and fencing. The Project is located on approximately 1,385 acres. Please refer to the Site Map in Attachment A for a layout diagram of the Project.

The useful life of solar panels is generally considered to be 35 years. At that time, the Project will either be decommissioned or repowered with newer technology. The Narrative identifies components which may be removed, and the areas that may be restored once the Project has not operated for twelve consecutive months, or when the Project has surpassed the useful lifespan of the modules and facilities.

## 2.0 Proposed Future Land Use

Prior to the development of the Project, the land use of the project area was primarily agricultural production of row crops. After all equipment and infrastructure is removed during decommissioning, any holes or voids created by poles, concrete pads and other equipment will be filled in with native soil to the surrounding grade and the site will be restored to pre-construction conditions to the extent practicable. All access roads and other areas compacted by equipment will be decompacted to a depth necessary to ensure drainage of the soil and root penetration prior to fine grading and tilling to a farmable condition. Please refer to Section 3.2 for a detailed description of reclamation activities.

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<sup>1</sup> The Final Development Plan – Site Plan (Rev. N) was the basis for this estimate. In accordance with Section 2.2 of the Decommissioning Plan Agreement, the Decommissioning Cost may be adjusted prior to the pre-construction meeting based on final engineering design.

## 3.0 Decommissioning Activities

Decommissioning of the solar Project will include removing the solar panels, solar panel racking, steel foundation posts and beams, inverters, transformers, overhead and underground cables and lines, equipment pads and foundations, equipment cabinets, and ancillary equipment. The civil facilities, including access roads, security fencing, and drainage structures and sedimentation basins are included in the scope. For the avoidance of doubt, the Road Use Agreement governs the Project's obligations associated with the repair or restoration of any public roads damaged by the decommissioning activities, so such costs have been excluded from the estimate of Removal Costs. Standard decommissioning practices would be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements.

During decommissioning the landowners will be consulted to identify the extent and type of work to be completed. Some Project infrastructure, such as the access roads, may be left in place at the landowners' requests. Underground utility lines, if deeper than 5 feet below ground surface elevation, may be left in place to minimize land disturbance and associated impacts to future land use.

Decommissioning will include the removal and transportation of all project components from the Project site. All dismantling, removal, recycling, and disposal of materials generated during decommissioning will comply with rules, regulations, and prevailing Federal, State, and local laws at the time decommissioning is initiated, and will use approved local or regional disposal or recycling sites as available. Recyclable materials will be recycled to the furthest extent practicable. Non-recyclable materials will be disposed of in accordance with State and Federal law.

### 3.1 Decommissioning of Project Components

#### 3.1.1 Modules

Modules will be inspected for physical damage, tested for functionality, and disconnected and removed from racking. Functioning modules will be packed, palletized, and shipped to an offsite facility for reuse or resale. Non-functioning modules will be shipped to the manufacturer or a third party for recycling or disposal.

#### 3.1.2 Racking

Racking and racking components will be disassembled and removed from the steel foundation posts, processed to appropriate size, and sent to a metal recycling facility.

#### 3.1.3 Steel Foundation Posts

All structural foundation steel posts will be pulled out to full depth, removed, processed to appropriate size, and shipped to a recycling facility. The posts can be removed using back hoes or similar equipment. During decommissioning, the area around the foundation posts may be compacted by equipment and, if compacted, the area will be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density consistent for vegetation.

### **3.1.4 Overhead and Underground Cables and Lines**

All underground cables and conduits will be removed to a depth of 5 feet, which will not impede the reintroduction of farming. Topsoil will be segregated and stockpiled for later use prior to any excavation and the subsurface soils will be staged next to the excavation. The subgrade will be compacted per standards. Topsoil will be redistributed across the disturbed area. Overhead lines will be removed from the project and taken to a recycling facility.

### **3.1.5 Inverters, Transformers, and Ancillary Equipment**

All electrical equipment will be disconnected and disassembled. All parts will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Owner's sole discretion, consistent with applicable regulations and industry standards.

### **3.1.6 Equipment Foundations and Ancillary Foundations**

The ancillary foundations are pile foundations for the equipment pads. As with the solar array steel foundation posts, the foundation piles will be pulled out completely. Duct banks will be excavated to a depth of at least 5 feet. All unexcavated areas compacted by equipment used in decommissioning will be de-compacted in a manner to adequately restore the topsoil and subgrade material to a density similar to the surrounding soils. All materials will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Owner's sole discretion, consistent with applicable regulations and industry standards.

### **3.1.7 Fence**

All fence parts and foundations will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately, at the Owner's sole discretion, consistent with applicable regulations and industry standards. The surrounding areas will be restored to pre-solar farm conditions to extent feasible.

### **3.1.8 Access Roads**

Project access roads will be used for decommissioning purposes, after which removal of roads will be discussed with the Landowner, using the following process:

1. After final clean-up, roads may be left intact through mutual agreement of the landowner and the Owner unless otherwise restricted by federal, state, or local regulations.
2. If a road is to be removed, aggregate will be removed and shipped from the site to be reused, sold, or disposed of appropriately, at the Owner's sole discretion, consistent with applicable regulations and industry standards. Clean aggregate can often be used as "daily cover" at landfills for no disposal cost. All internal service roads are constructed with geotextile fabric and aggregate over compacted subgrade. Any ditch crossing connecting access road to public roads will be removed unless the landowner requests it remain. The subgrade will be de-compacted using a chisel plow or other appropriate subsoiling equipment. All rocks larger than four inches will be removed. Topsoil that was stockpiled during the original construction will be distributed across the open area. The access roads and adjacent areas that are compacted by equipment will be de-compacted.

### **3.1.9 Substation**

Decommissioning of the Project substation will be performed with the rest of the Project. All

steel, conductors, switches, transformers, and other components of the substation will be disassembled and taken off-site to be recycled or reused. Foundations and underground components will be removed to a depth of 5 feet. The rock base will be removed using bulldozers and backhoes or front loaders. The material will be hauled from the site using dump trucks to be recycled or disposed at an off-site facility. Additionally, any permanent storm water treatment facilities will be removed. Topsoil will be reapplied to match surrounding grade to preserve existing drainage patterns. Topsoil and subsoil will be decompacted to a minimum depth of 18 inches and the site will be revegetated to match pre-construction conditions.

### **3.1.10 Operations and Maintenance Building**

The O&M Building is a sturdy, general purpose steel building. If the building is not repurposed, decommissioning will include disconnection of the utilities, demolition of the building structure, foundation, and rock base parking lot, and associated vegetated/stormwater handling facilities. All associated materials will be removed from the site using wheeled loaders or backhoes and bulldozers and hauled off site in dump trucks. All materials which are able to be recycled will be brought to appropriate facilities and sold; the remaining materials will be disposed of at an approved landfill facility. Subgrade soils will be de-compacted and graded to blend with the adjacent topography. Topsoil will be reapplied at the site and graded to blend with the surrounding grade to maintain existing drainage patterns. Topsoil will be reapplied to match existing surrounding grade to preserve existing drainage patterns, and the site will be tilled either to a farmable condition or re-vegetated, depending upon location.

## **3.2 Reclamation**

The Owner will restore and reclaim the site to the pre-solar farm condition consistent with the Project's lease agreements. The Owner assumes that most of the site will be returned to farmland and/or pasture after decommissioning and will implement appropriate measures to facilitate such uses. The goal of restoration will be to restore natural hydrology and plant communities to the greatest extent practicable while minimizing new disturbance and removal of native vegetation. In addition to the reclamation activities described above for each decommissioning activity, all unexcavated areas compacted by equipment and activity during the decommissioning will be decompacted to a depth of 18 inches or to a depth as needed to ensure proper density of topsoil consistent and compatible with the surrounding area and associated land use. All materials and debris associated with the Project decommissioning will be removed and properly recycled or disposed of at off-site facilities.

## **4.0 Best Management Practices (BMPs)**

During decommissioning, erosion and sediment control BMPs will be implemented to minimize potential for erosion of site soils and sedimentation of surface waters and waters of the state. Because decommissioning will entail disturbance of more than one acre of soil, the Project Owner will prepare a stormwater pollution prevention plan (SWPPP) and obtain coverage under the state-specific National Pollutant Discharge Elimination System (NPDES) permit prior to initiating soil disturbing activities. Potential BMPs to be implemented during decommissioning activities are described below and will be subject to refinement in the SWPPP. The decommissioning team will review the permitting requirements at the time of decommissioning, and obtain any other necessary permits, which may include a U.S. Army Corps of Engineers

## Section 404 Permit to Discharge Dredged or Fill Material.

### 4.1 Erosion Control

Erosion control measures will be refined based on the standard of practice current at the time the SWPPP is developed for decommissioning. All disturbed areas without permanent impermeable or gravel surfaces, or planned for use as crop land, will be vegetated for final stabilization. All slopes steeper than 4:1 should be protected with erosion control blankets. Restoration should include seed application prior to application of the blanket. All slopes 4:1 or flatter should be restored with seed and mulch, which will be disc anchored.

Project Phasing/Design BMP: Time periods during which disturbed soils are exposed should be minimized to the degree possible. Stabilization of soils will generally be accomplished immediately following decommissioning and removal of the access roads, fencing, modules and racking, equipment, electrical and fiber optic cables, substation, and O&M facilities. Where this is not possible, temporarily exposed soils will be temporarily stabilized with vegetation in accordance with the SWPPP for decommissioning.

Erosion Control Blankets and Seed BMP: Erosion control blanket (double sided netting with wood fiber or weed-free straw fiber blanket) will be used as temporary stabilization for areas of slopes steeper than 4:1 and for areas of concentrated flow, such as ditches, swales, and similar areas around culverts. Seed will be applied in these areas with the blanket for temporary and/or permanent vegetative growth as necessary. The SWPPP developed for decommissioning will provide detailed specifications for erosion control blankets to be used under various slope and drainage conditions.

Ditch/Channel Protection: Where new channels are formed, as in the case of culverts removed from access roads and the removal of low water crossings, the resulting channel will be protected with erosion control blankets as described in the section above.

Surface Roughening: Surface roughening or slope tracking is the act of running a dozer or other heavy tracked equipment perpendicular to the grade of disturbed slopes with a grade of 3H:1V and steeper with a continuous length of 75 feet or greater. The tracks will provide a rough surface to decrease erosion potential during an interim period until a smooth grade, seed and erosion control blanket can be applied.

Temporary Mulch Cover and Seed BMP: Temporary mulch cover (wood fiber to resist loss from grazing by wildlife or domestic animals) will be applied at a rate of two tons per acre to provide temporary erosion protection of exposed soils areas with slopes flatter than or equal to 3:1. Seed will be applied with the mulch for temporary and/or permanent vegetative growth as called for in the SWPPP. Mulch will be used for all soil types where slopes are flatter than 3:1 and no significant concentrated flows are present. The mulch will be disc-anchored to the soil to keep it from blowing away. The mulch prohibits the impact of the rain drop from dislodging soil and subsequently carrying the soil away during sheet drainage. In sandy soils tackifier may be used to assist the disc anchoring if the mulch cannot be secured to the sandy soils.

Soil Stockpiles: Topsoil that is stripped from the construction site and base materials will be stockpiled on site. Stockpile areas will be located in areas that will not interfere with the decommissioning activities, and be located away from pavement, site drainage routes, or other areas of concentrated flow. Stockpiles should also be located away from wetlands and surface waters. Perimeter controls, such as silt fence, will be installed around all stockpiles if stockpiles

are not placed within existing silt fences or other sediment control, where the potential exists for material to be eroded and transported to sensitive nature resources. Soils that are stockpiled for longer durations will be temporarily seeded and mulched or stabilized with a bonded fiber polymer emulsion.

Permanent seed and temporary mulch and / or erosion control blanket BMP: In areas at final grade that will not be used for agriculture, permanent seed will be applied to promote vegetative cover for permanent erosion control. Temporary mulch and/or erosion control blanket will be applied as appropriate in areas to provide temporary erosion protection until the permanent seed is established.

## 4.2 Sediment Control

Removal of Ditch Crossing BMP: Temporary ditch crossings may be needed to accommodate the movements of cranes or other heavy equipment. Perimeter controls such as silt fence will be used at crossing locations to minimize runoff from exposed soils. Crossings will be done during dry conditions, if possible. If a stream is wet at the time of the crossing, alternative BMPs will be applied. These could include a temporary dam and bypass pump to install the crossing in dry conditions. Timber construction mats will be used as needed to prevent compaction and rutting at crossing locations. All temporary fills and construction mats will be removed immediately after the crossing is successfully completed and the temporarily disturbed area restored using the appropriate BMPs as described above.

Dewatering: A temporary sump and rock base will be used if a temporary pump is used to dewater an area of accumulated water. If a rock base cannot be used, the pump intake will be elevated to draw water from the top of the water column to avoid the intake and discharge of turbid water. Energy dissipation riprap will be applied to the discharge area of the pump hose. The water will be discharged to a large flat vegetated area for filtration/infiltration prior to draining into receiving waters of conveyances/ditches. If discharge water is unavoidably turbid, dewatering bags, temporary traps, rock weepers, or other adequate BMP will be used to control sediment discharge.

Silt Fence BMP or Fiber Logs: Silt fences or fiber logs will be used as perimeter controls downgradient of exposed soils during construction to capture suspended sediment particles on site, to extent possible. The standard silt fence or fiber logs will also be used in smaller watershed areas where the contributing areas are typically less than 1/4 acre of drainage per 100 feet of standard silt fence or the fiber logs. Standard silt fence or fiber logs will also be used for stockpiles 8 feet high or higher which have slopes of 3:1 or steeper. Standard silt fence or fiber logs should not be used in areas of highly erodible soils which are found within streams, slopes, or banks of creeks and streams within the Project's site.

Rock Entrance/Exit Tracking Control BMP: Rock construction entrances will be installed where access to a construction area is needed from adjacent paved surfaces.

Street Scraping/Sweeping BMP: Street scraping and sweeping will be used to retrieve sediment tracked or washed onto paved surfaces at the end of each working day, or as needed.

## 4.3 Controlling Stormwater Flowing onto and through the Project

Given the low gradient of the slopes in the project area, controlling stormwater flow that enters the project area will likely require minimal effort during decommissioning activities. Only newly

disturbed areas may require new, temporary stormwater control.

Diversion Berms/Swales/Ditches: It may be necessary to direct diverted flow toward temporary settling basins via berms, swales, or ditches. If diversion controls are deemed necessary for decommissioning activities, these must be stabilized by temporary mulch and seeding, erosion control blankets, or by installing riprap to protect the channel from erosive forces.

Rock Check Dams: It may be necessary to install temporary check dams within swales or ditches that convey storm water from areas disturbed by decommissioning activities. Rock check dams are effective for velocity control, sediment control, and to augment temporary stabilization of channels. Filter fabric can be utilized to help filter the flow, minimize the scour of the soil under the rock, and facilitate removal of the check dams once permanent stabilization is achieved. The height of check dams should be at least two feet. Spacing depends upon slope. Downgradient rock checks should have the top elevation at the same elevation as the bottom of the previous (upgradient) rock check.

Hay Bale Check Dams: Hay bale check dams may be used for velocity control within swales of the project to slow the water runoff within the drainage channels/swales. The bales should be approximately three feet in length and anchored into the soil. The midpoint elevation of the top of the bale (i.e., ponding height) must be lower than the end points of the bale where the bale meets grade, to prohibit water from flowing around the bales thus causing erosion and scour. If the bales cannot be applied properly in the field, the use of rock checks as a replacement is recommended.

Temporary Sedimentation Basins: Sedimentation basins serve to remove sediment from runoff from disturbed areas of the site. The basins allow runoff to be detained long enough to allow the majority of the sediment to settle out prior to discharge. The location and dimensions of temporary sedimentation basins, if any are necessary, will be verified in accordance with Indiana Department of Environmental Management requirements at the time of decommissioning.

#### 4.4 Permitting

All decommissioning and reclamation activities will comply with Federal and State permit requirements. Decommissioning activities that will disturb more than one acre of soil will require coverage under the state-specific NPDES permit for construction stormwater. The permits will be applied for and received prior to decommissioning construction activities commencing. A SWPPP will be developed prior to filing for construction stormwater permit coverage.

If necessary for decommissioning activities, wetlands and waters permits will be obtained as needed from the US Army Corps of Engineers (USACE) or the Indiana Department of Environmental Management. A Spill Prevention, Control and Countermeasure (SPCC) Plan for decommissioning will likely be required for decommissioning work as well.

Work will be conducted in strict accordance with the Project Owner's health and safety plan. The construction contractor hired to perform the decommissioning will also be required to prepare a site-specific health and safety plan. All site workers, including subcontractors, will be required to read, understand, and abide by the plans. A site safety officer will be designated by the construction contractor to ensure compliance. This official will have stop-work authority over all activities on the site should unsafe conditions or lapses in the safety plan be observed.

## 5.0 Timeline

Decommissioning of the solar farm will be initiated if the project has not produced electricity for a period of up to one (1) year. It is anticipated that the decommissioning activities for the project can be completed in a forty (40) week period. The estimated costs for decommissioning are tied to assumptions about the amount of equipment mobilized, the crew sizes, weather and climate conditions, and the productivity of the equipment and crews.

## 6.0 Decommissioning Costs

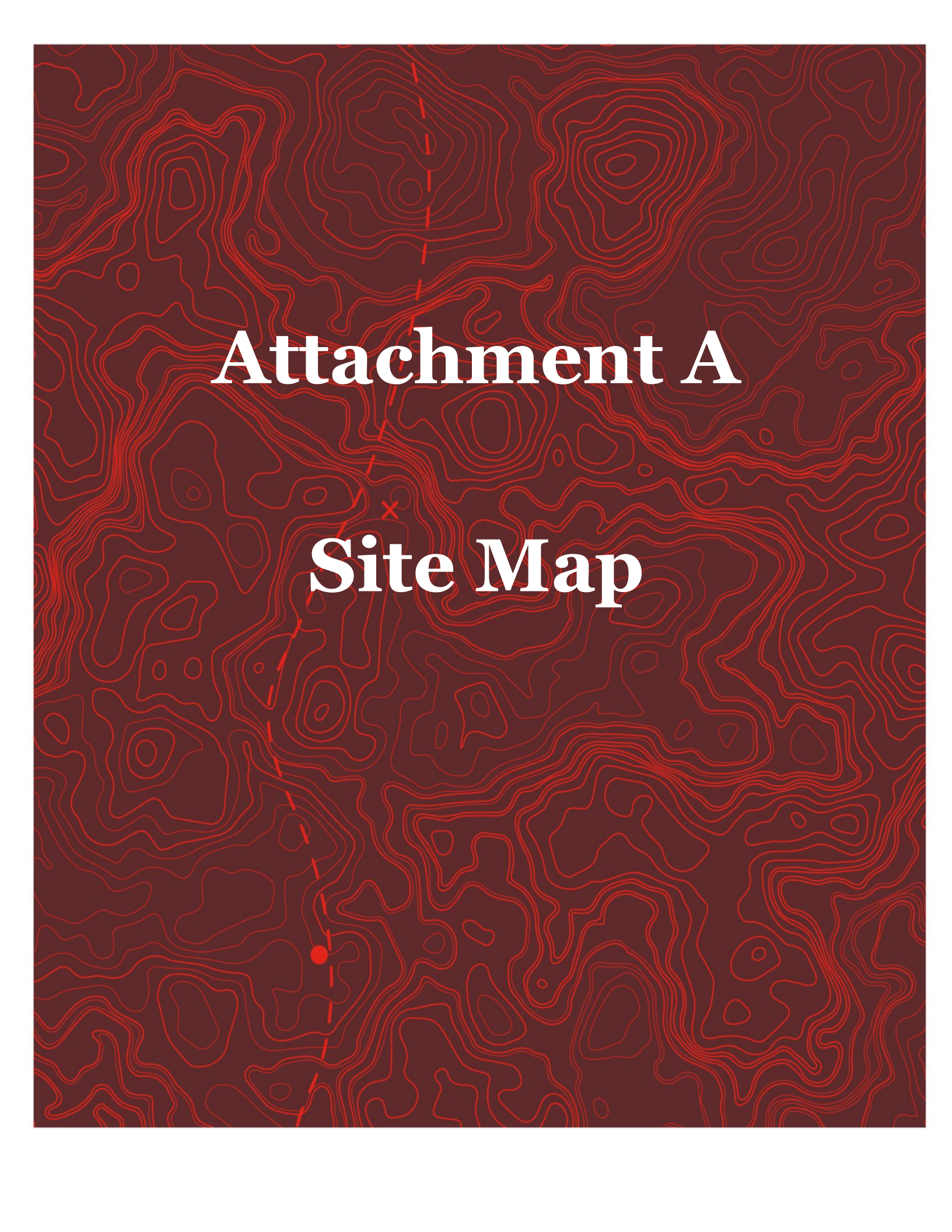
The decommissioning costs are calculated using current pricing. In keeping with the requirements of the Posey County Solar and Wind Ordinance Section 153.124.03(E), the estimate of net costs should be updated every five (5) years to recognize price trends for both decommissioning costs and the salvage and resale values of the components.

There are currently active markets for scrap steel, aluminum, and copper, used transformers and electrical equipment, and used solar panels. Scrap metal prices have been discounted from posted spot prices found on [www.scrapmonster.com](http://www.scrapmonster.com). Pricing for used panels has been discounted from prices received from We Recycle Solar for a similar project. The pricing of the used panels has incorporated the degradation from five (5) years of use as warranted the manufacturer (no more than 2% for the 1<sup>st</sup> year and 0.45% per year linear degradation thereafter).

The total estimated cost of the decommissioning of the Posey Solar Project is approximately \$12,025,256.

The estimated salvage/scrap value of the modules, racking, transformers, and other materials is approximately \$31,647,727.

The recommended Decommissioning Security for the project is  $(125\% \times \$12,025,256) - (35\% \times \$31,647,727)$ , or \$3,954,866.

The background of the entire page is a topographic map. It features a dark reddish-brown base color with intricate, lighter red contour lines that create a complex, wavy pattern across the surface. A dashed red line runs vertically through the left-center portion of the image. A small, solid red dot is positioned on this dashed line in the lower-left quadrant. A small red 'x' mark is located near the center of the image, slightly to the left of the main text.

# Attachment A

## Site Map

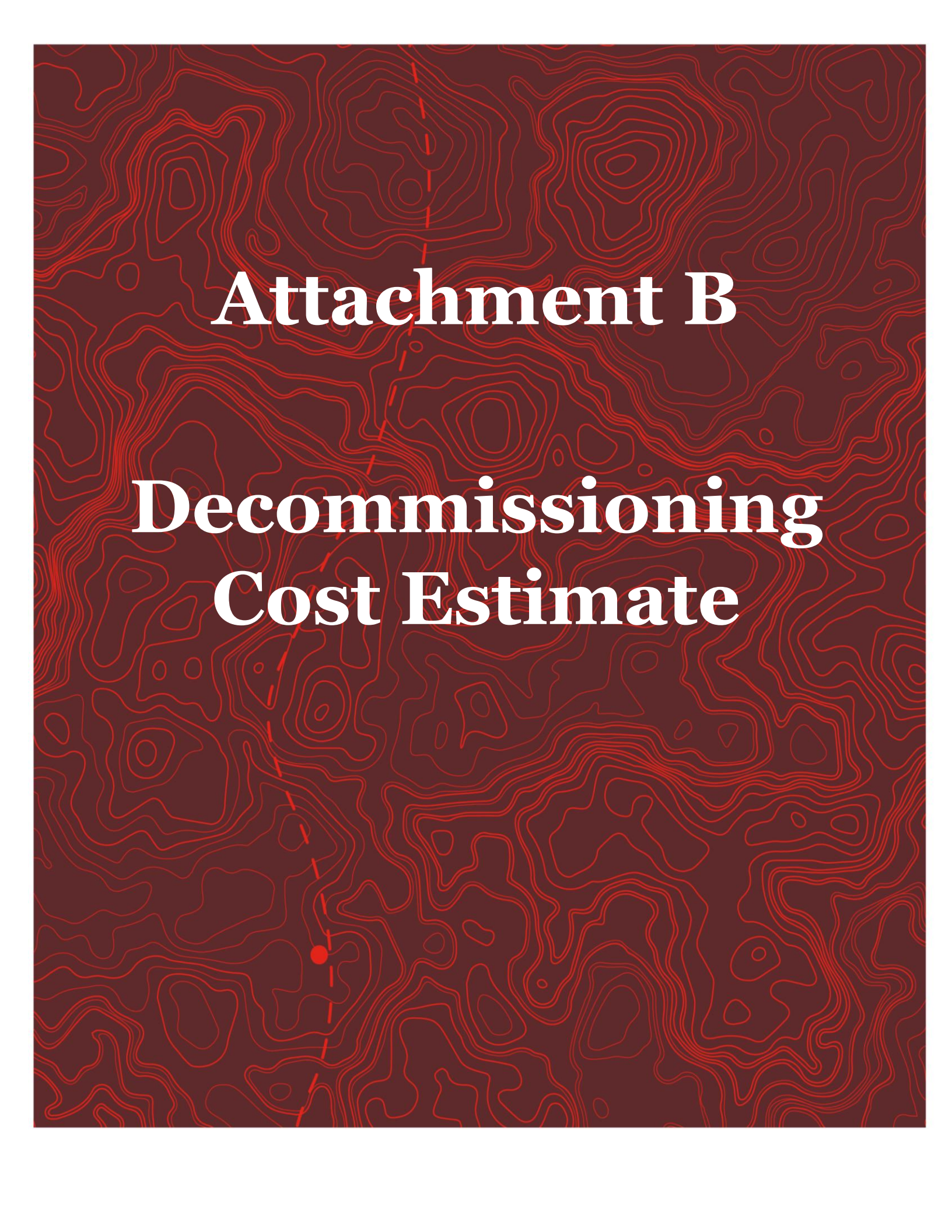


Substation
  Switchyard
  O&M Building
  Array
  Fence
  County Boundaries
  Access Roads
  Collection
  Culverts
  Inverters



## Site Map

June 8, 2022

The background of the entire page is a dark red topographic map. It features intricate, light red contour lines that swirl and loop across the surface. A dashed red line runs vertically through the center-left portion of the image, starting from the top and ending near the bottom. A solid red dot is positioned on this dashed line, approximately one-third of the way up from the bottom.

# **Attachment B**

## **Decommissioning Cost Estimate**

| Posey Solar Project                                                                                                                                                                                                                                                                                                   |          |                  |              |                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|--------------|--------------------|
| Project Size                                                                                                                                                                                                                                                                                                          | 292.91   | MW-DC            | 228.84       | MW-AC              |
|                                                                                                                                                                                                                                                                                                                       | Quantity | Unit             | Unit Cost    | Total Cost         |
| <b>Mobilization/Demobilization</b>                                                                                                                                                                                                                                                                                    | 1        | Lump Sum         | \$756,300.00 | \$756,300          |
| Mobilization was estimated to be approximately 7% of total cost of other items excluding permitting and project management.                                                                                                                                                                                           |          |                  |              |                    |
|                                                                                                                                                                                                                                                                                                                       |          |                  |              |                    |
|                                                                                                                                                                                                                                                                                                                       |          |                  |              |                    |
| <b>Permitting</b>                                                                                                                                                                                                                                                                                                     |          |                  |              |                    |
| County Permits                                                                                                                                                                                                                                                                                                        | 1        | Lump Sum         | \$10,000.00  | \$10,000           |
| State Permits                                                                                                                                                                                                                                                                                                         | 1        | Lump Sum         | \$20,000.00  | \$20,000           |
| <b>Subtotal Permitting</b>                                                                                                                                                                                                                                                                                            |          |                  |              | <b>\$30,000</b>    |
| Decommissioning will require a SWPPP and SPCC plan, cost is an estimate of the permit preparation cost                                                                                                                                                                                                                |          |                  |              |                    |
|                                                                                                                                                                                                                                                                                                                       |          |                  |              |                    |
| <b>Civil Infrastructure</b>                                                                                                                                                                                                                                                                                           |          |                  |              |                    |
| Remove Gravel Surfacing from Road                                                                                                                                                                                                                                                                                     | 28,169   | Cubic Yards (BV) | \$3.95       | \$111,178          |
| Haul Gravel Removed from Road (Evansville, IN)                                                                                                                                                                                                                                                                        | 32,394   | Cubic Yards (LV) | \$6.58       | \$213,285          |
| Disposal of Gravel Removed from Road, use as "Daily Cover", no cost                                                                                                                                                                                                                                                   | 41,983   | Tons             | \$0.00       | \$0                |
| Removal Geotextile Fabric from Road Area                                                                                                                                                                                                                                                                              | 142,606  | Square Yards     | \$1.40       | \$199,648          |
| Haul Geotech Fabric Removed from Beneath Access Roads                                                                                                                                                                                                                                                                 | 39       | Tons             | \$5.67       | \$222              |
| Disposal of Geotech Fabric Removed from Beneath Access Roads                                                                                                                                                                                                                                                          | 39       | Tons             | \$88.00      | \$3,451            |
| Remove and Load Culvert from Beneath Access Roads                                                                                                                                                                                                                                                                     | 21       | Each             | \$674.80     | \$14,171           |
| Haul Culvert Removed from Access Roads                                                                                                                                                                                                                                                                                | 6.3      | Tons             | \$5.67       | \$36               |
| Disposal of Culverts                                                                                                                                                                                                                                                                                                  | 6.3      | Tons             | \$88.00      | \$554              |
| Removal Low Water Crossing from Road                                                                                                                                                                                                                                                                                  | 6.0      | Each             | \$3,400.00   | \$20,400           |
| Haul Low Water Crossing Materials Removed from Access Road                                                                                                                                                                                                                                                            | 1.8      | Tons             | \$6.58       | \$12               |
| Disposal of Low Water Crossing Materials                                                                                                                                                                                                                                                                              | 1.8      | Tons             | \$88.00      | \$158              |
| Grade Road Corridor (Re-spread Topsoil)                                                                                                                                                                                                                                                                               | 71,303   | Linear Feet      | \$1.07       | \$76,239           |
| Decompaction on Road Area                                                                                                                                                                                                                                                                                             | 39.29    | Acres            | \$89.03      | \$3,498            |
| Removal of Security Fence (Chainlink Fence)                                                                                                                                                                                                                                                                           | 3,710    | Linear Feet      | \$6.69       | \$24,812           |
| Removal of Wire Fence                                                                                                                                                                                                                                                                                                 | 165,362  | Linear Feet      | \$4.00       | \$661,448          |
| <b>Subtotal Civil Infrastructure</b>                                                                                                                                                                                                                                                                                  |          |                  |              | <b>\$1,329,113</b> |
|                                                                                                                                                                                                                                                                                                                       |          |                  |              |                    |
| <b>Structural Infrastructure</b>                                                                                                                                                                                                                                                                                      |          |                  |              |                    |
| Remove Steel Foundation Posts(Includes equipment foundation posts)                                                                                                                                                                                                                                                    | 58,455   | Each             | \$11.19      | \$654,376          |
| Haul Steel Post (Evansville, IN)                                                                                                                                                                                                                                                                                      | 3,507    | Tons             | \$4.11       | \$14,407           |
| Removal of Tracker Array Racking                                                                                                                                                                                                                                                                                      | 19,738   | Each             | \$109.60     | \$2,163,318        |
| Haul Tracker Array Racking (Evansville, IN)                                                                                                                                                                                                                                                                           | 16,516   | Ton              | \$4.11       | \$67,843           |
| <b>Subtotal Structural Infrastructure</b>                                                                                                                                                                                                                                                                             |          |                  |              | <b>\$2,899,944</b> |
| Steel removal costs were calculated by using RS Means information for demolition of steel members.                                                                                                                                                                                                                    |          |                  |              |                    |
| Hauling costs are based on the locations of metals recyclers.                                                                                                                                                                                                                                                         |          |                  |              |                    |
|                                                                                                                                                                                                                                                                                                                       |          |                  |              |                    |
|                                                                                                                                                                                                                                                                                                                       |          |                  |              |                    |
| <b>Electrical Collection/Transmission System</b>                                                                                                                                                                                                                                                                      |          |                  |              |                    |
| Removal of PV Panels                                                                                                                                                                                                                                                                                                  | 552,664  | Each             | \$5.52       | \$3,051,166        |
| Haul PV 95% of Panels to Reseller (Louisville, KY)                                                                                                                                                                                                                                                                    | 17,015   | Tons             | \$23.86      | \$405,935          |
| Haul 5% of PV Panels for Disposal (Evansville, IN)                                                                                                                                                                                                                                                                    | 896      | Tons             | \$5.67       | \$5,074            |
| Removal of Equipment Skids                                                                                                                                                                                                                                                                                            | 69       | Each             | \$1,739.59   | \$120,032          |
| Haul Equipment to Recycler (Evansville, IN)                                                                                                                                                                                                                                                                           | 69       | Each             | \$102.69     | \$7,086            |
| Removal of Scada Equipment                                                                                                                                                                                                                                                                                            | 1        | Each             | \$2,000.00   | \$2,000            |
| Removal of DC Collector System Cables (copper)                                                                                                                                                                                                                                                                        | 293      | Per MW           | \$2,000.00   | \$585,824          |
| Removal of Underground (AC) Collector System Cables                                                                                                                                                                                                                                                                   | 672,180  | LF               | \$2.22       | \$1,494,054        |
| Load and Haul Cables for Recycling                                                                                                                                                                                                                                                                                    | 440      | Tons             | \$4.11       | \$1,806            |
| <b>Subtotal Electrical Collection/Transmission System</b>                                                                                                                                                                                                                                                             |          |                  |              | <b>\$5,672,977</b> |
| Electrical removal costs of PV Panels and Combiner Boxes were based industry standard installation rates. Equipment pads, MV Equipment and Scada Equipment removal cost are based on removal of equipment, concrete pads, and conduits using a truck mounted crane and RS Means information on crew production rates. |          |                  |              |                    |

|                                                                        |         |                  |             |                     |
|------------------------------------------------------------------------|---------|------------------|-------------|---------------------|
| <b>Substation &amp; Switchyard</b>                                     |         |                  |             |                     |
| Disassembly and Removal of Main Power Transformer(s)                   | 1       | Each             | \$4,500.00  | \$4,500             |
| Freight Transformer(s) Offsite                                         | 287     | Tons             | \$4.11      | \$1,179             |
| Disposal of Transformer, Including Oil (See Salvage Values below)      | 1       | Each             | \$0.00      | \$0                 |
| Excavate Around Transformer Foundation(s)                              | 1       | Each             | \$1,641.60  | \$1,642             |
| Remove Complete Transformer Foundation(s)                              | 80      | CY               | \$106.18    | \$8,494             |
| Backfill Excavation Area from Transformer Foundation Removal           | 80      | CY               | \$41.85     | \$3,348             |
| Haul Concrete (Transformer, Switch Gear, etc. Foundations)             | 325     | Tons             | \$5.67      | \$1,840             |
| Disposal of Concrete from Transformer Foundation                       | 325     | Tons             | \$88.00     | \$28,582            |
| Demolish Substation and Switchyard Site Improvements (fences, etc)     | 2       | LS               | \$3,500.00  | \$7,000             |
| Demolish Control Building and Foundation                               | 1       | LS               | \$12,000.00 | \$12,000            |
| Remove Medium/High Voltage Equipment                                   | 2       | LS               | \$3,500.00  | \$7,000             |
| Remove Structural Steel Substation Frame                               | 2       | LS               | \$3,500.00  | \$7,000             |
| Haul - Demolition Materials, Removed Equipment & Structural Steel      | 40      | Tons             | \$28.33     | \$1,133             |
| Disposal of Demolition Materials, Removed Equipment & Struct. Steel    | 10      | Tons             | \$88.00     | \$880               |
| Remove and Load Gravel Surfacing from Substation and Switchyard Sites  | 6,649   | Cubic Yards (BV) | \$3.95      | \$26,241            |
| Haul Gravel Removed from Substation and Switchyard Site                | 8,311   | Cubic Yards (LV) | \$5.67      | \$47,090            |
| Disposal of Gravel from Substation Site, use as "Daily Cover", no cost | 10,771  | Tons             | \$0.00      | \$0                 |
| Grade Substation Site                                                  | 269,275 | SF               | \$0.07      | \$17,682            |
| Erosion and Sediment Control at Substation Site                        | 3010    | LF               | \$3.18      | \$9,560             |
| Decompact Substation Site (Subsoiling)                                 | 6.18    | Acres            | \$89.03     | \$550               |
| <b>Subtotal Substation</b>                                             |         |                  |             | <b>\$185,722</b>    |
| <b>O&amp;M Building</b>                                                |         |                  |             |                     |
| Demolish O&M Building and Foundation                                   | 1       | Lump Sum         | \$10,000.00 | \$10,000            |
| Haul Concrete (O&M Building Foundation)                                | 296     | Cubic Yards      | \$4.11      | \$1,217             |
| Crush Concrete (O&M Building Foundation)                               | 296     | Cubic Yards      | \$5.67      | \$1,679             |
| Disposal of Concrete from O&M Building Foundation                      | 600     | Tons             | \$88.00     | \$52,800            |
| Cap and Abandon Well                                                   | 1       | Lump Sum         | \$1,000.00  | \$1,000             |
| Remove & Restore Septic and Drainfield area                            | 1       | Lump Sum         | \$3,000.00  | \$3,000             |
| Disposal of O&M Building Demolition and Removed Site Improvements      | 1       | Lump Sum         | \$2,500.00  | \$2,500             |
| Remove and Load Gravel Surfacing of O&M Site                           | 17      | Cubic Yards (BV) | \$3.95      | \$68                |
| Haul Gravel Removed from O&M Site                                      | 22      | Cubic Yards (LV) | \$6.80      | \$147               |
| Disposal of Gravel from O&M Site                                       | 28      | Tons             | \$0.00      | \$0                 |
| Decompact O&M Building Site                                            | 0.02    | Acres            | \$89.03     | \$1                 |
| Grade O&M Building Site                                                | 4,000   | SF               | \$0.07      | \$263               |
| Erosion and Sediment Control at O&M Building Site                      | 253     | Linear Feet      | \$3.18      | \$803               |
| Topsoil and Turf Establishment at O&M Building Site                    | 0.1     | Acres            | \$236.80    | \$22                |
| <b>Subtotal O&amp;M Building</b>                                       |         |                  |             | <b>\$73,500</b>     |
| <b>Site Restoration</b>                                                |         |                  |             |                     |
| Stabilized Construction Entrance                                       | 21      | Each             | \$2,000.00  | \$42,000            |
| Perimeter Controls (Erosion and Sediment Control)                      | 120,188 | Linear Feet      | \$3.18      | \$381,716           |
| Till to Farmable Condition (Not including Substation Area)             | 1,385.5 | Acres            | \$158.78    | \$219,985           |
| <b>Subtotal Site Restoration</b>                                       |         |                  |             | <b>\$643,700</b>    |
| <b>Project Management</b>                                              |         |                  |             |                     |
| Project Manager                                                        | 40      | Weeks            | \$3,800.00  | \$152,000           |
| Superintendent                                                         | 40      | Weeks            | \$3,525.00  | \$141,000           |
| Field Engineer                                                         | 40      | Weeks            | \$2,775.00  | \$111,000           |
| Clerk                                                                  | 40      | Weeks            | \$750.00    | \$30,000            |
| <b>Subtotal Project Management</b>                                     |         |                  |             | <b>\$434,000</b>    |
| Standard industry weekly rates from RS Means. 40 week schedule used.   |         |                  |             |                     |
| <b>Subtotal Demolition/Removals</b>                                    |         |                  |             | <b>\$12,025,256</b> |

|                                                                                                                                                                                                                                                                                                                                                                        |           |         |          |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------|----------|------------------------|
| <b>Salvage</b>                                                                                                                                                                                                                                                                                                                                                         |           |         |          |                        |
| Fencing                                                                                                                                                                                                                                                                                                                                                                | 845       | Tons    | \$361.00 | \$305,175              |
| Steel Posts                                                                                                                                                                                                                                                                                                                                                            | 3,507     | Tons    | \$361.00 | \$1,266,135            |
| Module Racking                                                                                                                                                                                                                                                                                                                                                         | 16,516    | Tons    | \$361.00 | \$5,962,441            |
| PV Modules (540-watt module at \$0.0678125/watt)                                                                                                                                                                                                                                                                                                                       | 525,030   | Each    | \$35.94  | \$18,869,906           |
| Transformers and Inverters                                                                                                                                                                                                                                                                                                                                             | 2,472,641 | Pounds  | \$0.34   | \$834,516              |
| Substation Transformers (Metals)                                                                                                                                                                                                                                                                                                                                       | 342,956   | Pounds  | \$0.34   | \$115,748              |
| Transformers (Oil)                                                                                                                                                                                                                                                                                                                                                     | 39,515    | Gallons | \$0.70   | \$27,661               |
| DC Collection Lines                                                                                                                                                                                                                                                                                                                                                    | 791,624   | Pounds  | \$3.33   | \$2,636,109            |
| AC Collection Lines                                                                                                                                                                                                                                                                                                                                                    | 1,680,450 | Pounds  | \$0.97   | \$1,630,037            |
| <b>Subtotal Salvage</b>                                                                                                                                                                                                                                                                                                                                                |           |         |          | <b>\$31,647,727</b>    |
| Salvage values are a combination of the following factors; current market metal salvage prices, current secondary market for solar panel module recycling, discussions with national companies that specialize in recycling and reselling electrical transformers and inverters, and the assumption that care is taken to prevent any damage or breakage of equipment. |           |         |          |                        |
| <b>Total Demolition Minus Salvage</b>                                                                                                                                                                                                                                                                                                                                  |           |         |          | <b>\$ (19,622,470)</b> |
| Notes:                                                                                                                                                                                                                                                                                                                                                                 |           |         |          |                        |
| 1. Prices used in analysis are estimated based on research of current average costs and salvage values.                                                                                                                                                                                                                                                                |           |         |          |                        |
| 2. Prices provided are estimates and may fluctuate over the life of the project.                                                                                                                                                                                                                                                                                       |           |         |          |                        |
| 3. Contractor means and methods may vary and price will be affected by these.                                                                                                                                                                                                                                                                                          |           |         |          |                        |
| 4. Please note that most quantities have been displayed as integers for simplicity. Total costs may actually be calculated with hidden significant digits                                                                                                                                                                                                              |           |         |          |                        |
| <b>Recommended bond amount (125% of demo costs - 35% of salvage value)</b>                                                                                                                                                                                                                                                                                             |           |         |          | <b>\$3,954,865.76</b>  |

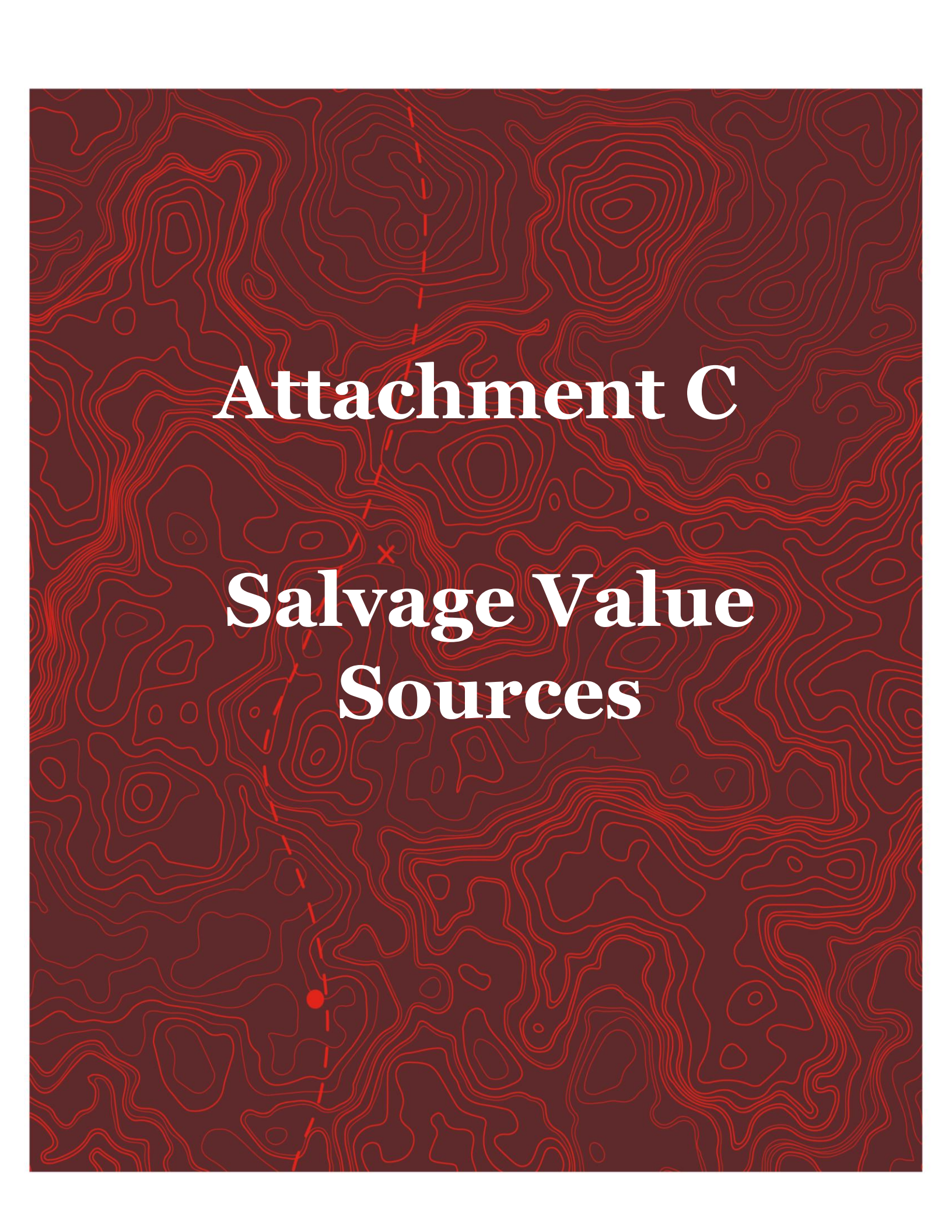
### Cost Estimate Assumptions

To develop a cost estimate for the decommissioning of the Posey Solar Project, Westwood engineers made the following assumptions and used the following pricing references. Costs were estimated based on current pricing, technology, and regulatory requirements. The assumptions are listed in order from top to bottom of the estimate spreadsheet. When publicly available bid prices or Department of Transportation (INDOT) bid summaries were not available for particular work items, we developed time- and material-based estimates considering composition of work crews and equipment and material required. While materials may have a salvage value at the end of the project life, the construction activity costs and the hauling/freight costs are separated from the disposal costs or salvage value to make revisions to salvage values more transparent.

1. The Decommissioning Cost estimate assumes that the Project decommissioning occurs within the first five (5) years of the approval of the initial Decommissioning Plan.
2. Most quantities in the cost estimate table have been displayed as integers for simplicity. Total costs may actually be calculated with hidden significant digits.
3. A project of this size and complexity requires a full-time project manager, with full time support staff.
4. Common labor will be used for the majority of tasks, supplemented by electricians, steel workers, and equipment operators where labor rules may require. The labor rates will reflect open shop labor rates, as estimated by applying a 20% reduction to labor rates obtained from RS Means estimating software.
5. Mobilization was estimated at approximately 7% of total cost of other items.
6. Permit applications will require the preparation of a Storm Water Pollution Protection Plan (SWPPP) and a Spill Prevention Control and Countermeasure (SPCC) Plan.

7. Road gravel removal was estimated on a time and material basis. Since the material will not remain on site, a hauling cost is added to the removal cost. Clean aggregate can typically be used as “daily cover” at landfills without incurring a disposal cost. The road gravel may also be used locally to fortify driveways, and local roads, lowering hauling costs, but incurring placing and compaction costs. The hauling costs to a landfill represents an upper limit to costs for disposal of the road gravel.
8. Grade Road Corridor reflects the cost of mobilizing and operating light equipment to spread and smooth the topsoil stockpiled on site during construction to replace the aggregate removed from the road.
9. Erosion and sediment control along road reflects the cost of silt fence on the downhill side of the road adjacent to wetlands and drainage swales.
10. Topsoil is required to be stockpiled on site during construction, so no topsoil replacement is expected to replace the road aggregate. Subsoiling cost to decompact roadway areas is estimated as \$89.03 per acre, tilling to an agriculture-ready condition is estimated as \$158.78 per acre.
11. Tracker array posts are lightweight “I” beam sections installed with a specialized piece of equipment and can be removed with a standard backhoe with an attachment for gripping the piles. We estimate crew productivity at 240 posts per day, using RS Means Standard Crew B-17B, resulting in a per post cost of approximately \$11.19.
12. A metal recycling facility (Henry Fliegeltaub Company) is located in Evansville, IN, approximately 10.5 miles from the project site. Pricing was acquired from both facilities and from [www.scrapmonster.com](http://www.scrapmonster.com). The posts weigh approximately 150 pounds each, and we estimate the hauling costs at approximately \$0.39 per ton mile. The pricing from scrapmonster was reduced to reflect the processing required for the posts to fit recycling requirements.
13. It’s assumed that the racking structures weigh approximately 15 pounds per linear foot or array. Each solar panel has a width of 44.65 inches. The Project has 552,664 modules, 2,202,194 feet of array, weighing 17,911 tons. The arrays are made of steel pipes so a crew with hand tools can disassemble and cut the pieces to sizes for recycling at a rate of about 1800 pounds per person per hour, or about \$110 per ton.
14. Hauling the steel to Evansville, IN (Henry Fliegeltaub Company) costs about \$4.11 per ton.
15. The solar panels for this project measure approximately 3.72 feet by 7.46 feet and weigh 64.82 pounds so they can easily be disconnected, removed, and packed by a three-person crew at a rate we estimate at 36 panels per hour.
16. The equipment skids will consist of inverter(s), a transformer, and a panel on a metal frame approximately 19 feet long, by 8 feet wide, by 8 feet 6 inches tall. The skids weigh approximately 36,000 pounds, and can be disconnected by a crew of electricians. They must be lifted by a mobile crane for transport to the recycler. They contain copper or aluminum windings.
17. The transformers contain either copper, or more commonly aluminum windings that have significant salvage value. They are typically oil filled, but most transformer recyclers will accept the transformers with oil. The estimated costs include removal of metal frame and conduits feeding the equipment.
18. Medium voltage (MV) equipment and SCADA equipment are mounted on the same equipment skids as the inverters and transformers, and are enclosed in weatherproof cabinets. Their size requires light equipment to remove them. The costs for the removal of the pile foundations are included in Remove Steel Foundation Posts.

19. The underground collector system cables are placed in trenches, with a minimum of 18 inches of cover. Several cables/circuits are placed side by side in each trench. The conduits and cables can be removed by trenching.
20. The project access is via a gravel surfaced road so we have not included a rock construction entrance to reduce tracking of sediment off-site by trucks removing materials.
21. Perimeter control pricing is based on silt fence installation around downgradient sides of the project perimeter.
22. No topsoil is planned to be removed from the site during construction, and most of the site will not have been compacted by heavy truck or equipment traffic. An allowance has been included for the substation and access roads for those areas to be decompacted of \$89.03 per acre. For the remainder of the fenced area the pricing is based on tilling the area to a farmable condition at a unit cost of \$158.78 per acre.
23. Metal salvage prices for steel and copper wire are based on five-year average commodity futures from July 2017 through July 2022, as published on [investing.com](https://www.investing.com), for scrap steel, copper wire, and aluminum, respectively. Historical pricing data for copper transformer scrap and oil were not available, therefore current pricing from [www.scrapmonster.com](https://www.scrapmonster.com) for the U.S. Midwest in June 2022 have been used with a 25% discount to account for historical variation.
24. The steel posts and array racking are priced based on steel scrap futures (\$361) as noted in the assumption, above.
25. Solar module degradation is approximately 0.55% per year, or 5% after 5 years. There is currently a robust market for used solar panels, and pricing can be found on ebay and other sites. We have assumed that as long as the modules are producing power they will have economic value. To avoid unconservative pricing for the used modules we used the minimum pricing of approximately \$0.0678125 per watt based on We Recycle Solar quote prepared on December 4, 2019 for panels with five-year depreciation. Based on the assumed module wattage of 530W, the salvage value per module is \$35.94. Pricing is based on delivery to their facility. For interim decommissioning, resale of used modules will be most cost effective.
26. There is an active market for reselling and recycling electrical transformers and inverters with several national companies specializing in recycling. The resale values of this equipment can vary based on the specific equipment and a Project-specific quotation was not solicited, so we have made the conservative assumption that the electrical equipment will be recycled at the time of decommissioning. The estimate assumes a value equivalent to the copper weight based on 100% recovery from the transformers and inverters.
27. The collection lines are priced assuming copper conductor wire for the DC circuits which is typical. The prices used reflect a reduced yield of the copper resulting from the insulation and other materials that must be stripped from the wire so that the copper can be recycled. The estimate uses the five-year average for copper futures, which is \$3.33 per pound as noted in the assumptions, above.
28. Care to prevent damage and breakage of equipment, PV modules, inverters, capacitors, and SCADA must be exercised, but removal assumes unskilled common labor under supervision.
29. All salvage will be for bulk material or equipment.



# Attachment C

## Salvage Value Sources

# Steel Scrap Futures - (SSCc1)

London

400.00 +15.00 (+3.90%)

18/07 - Delayed Data. Currency in USD ( Disclaimer )

Add to Watchlist

Create Alert

Type:  
Group:

Commodity  
Metals

Prev. Close: 385.00    Open: 400.00    Day's Range: 400.00 - 400.00

General   Chart   News & Analysis   Technical   Forum

Overview   Historical Data

## Steel Scrap Futures Historical Data

Time Frame:

Monthly   

Download Data

07/19/2017 - 07/19/2022

| Date   | Price  | Open   | High   | Low    | Vol.  | Change % |
|--------|--------|--------|--------|--------|-------|----------|
| Jul 22 | 400.00 | 393.00 | 393.00 | 393.00 | 0.02K | 6.97%    |
| Jun 22 | 373.94 | 440.00 | 440.00 | 440.00 | 6.00K | -22.69%  |
| May 22 | 483.67 | 516.00 | 516.00 | 516.00 | 5.08K | -21.94%  |
| Apr 22 | 619.64 | 638.00 | 638.00 | 638.00 | 1.83K | -3.31%   |
| Mar 22 | 640.88 | 585.00 | 585.00 | 585.00 | 1.86K | 27.19%   |
| Feb 22 | 503.88 | 498.00 | 498.00 | 498.00 | 3.69K | 7.30%    |
| Jan 22 | 469.60 | 465.00 | 465.00 | 465.00 | 2.39K | 0.42%    |
| Dec 21 | 467.62 | 465.00 | 465.00 | 465.00 | 1.37K | -5.68%   |
| Nov 21 | 495.77 | 485.00 | 485.00 | 485.00 | 1.03K | 3.19%    |
| Oct 21 | 480.46 | 450.00 | 450.00 | 450.00 | 0.72K | 9.23%    |
| Sep 21 | 439.88 | 451.50 | 451.50 | 451.50 | 1.45K | -3.27%   |
| Aug 21 | 454.73 | 479.00 | 479.00 | 479.00 | 0.31K | -6.21%   |
| Jul 21 | 484.84 | 510.00 | 510.00 | 510.00 | 2.73K | -3.14%   |
| Jun 21 | 500.55 | 509.00 | 509.00 | 509.00 | 0.26K | 0.15%    |
| May 21 | 499.82 | 500.00 | 500.00 | 500.00 | 0.69K | 16.26%   |
| Apr 21 | 429.91 | 460.00 | 460.00 | 460.00 | 1.49K | -1.47%   |
| Mar 21 | 436.33 | 471.50 | 471.50 | 471.50 | 0.88K | 4.75%    |
| Feb 21 | 416.55 | 387.50 | 387.50 | 387.50 | 3.48K | -8.10%   |
| Jan 21 | 453.26 | 480.00 | 480.00 | 480.00 | 1.23K | 7.13%    |
| Dec 20 | 423.10 | 372.00 | 372.00 | 372.00 | 1.69K | 32.28%   |
| Nov 20 | 319.85 | 293.50 | 293.50 | 293.50 | 1.85K | 10.87%   |
| Oct 20 | 288.50 | 292.00 | 292.00 | 292.00 | 0.53K | -2.81%   |
| Sep 20 | 296.84 | 299.00 | 299.00 | 299.00 | 1.88K | 4.41%    |
| Aug 20 | 284.30 | 293.00 | 293.00 | 293.00 | 1.29K | 8.09%    |
| Jul 20 | 263.03 | 263.00 | 263.00 | 263.00 | 0.39K | 0.85%    |
| Jun 20 | 260.82 | 263.00 | 263.00 | 263.00 | 0.50K | 5.68%    |
| May 20 | 246.80 | 242.00 | 242.00 | 242.00 | 1.11K | 0.94%    |
| Apr 20 | 244.51 | 224.00 | 224.00 | 224.00 | 1.27K | -2.45%   |
| Mar 20 | 250.65 | 267.00 | 267.00 | 267.00 | 1.78K | -7.63%   |
| Feb 20 | 271.34 | 271.34 | 271.34 | 271.34 | 2.55K | -6.17%   |
| Jan 20 | 289.18 | 289.18 | 289.18 | 289.18 | 0.07K | -1.90%   |
| Dec 19 | 294.78 | 294.78 | 294.78 | 294.78 | 0.41K | 12.64%   |
| Nov 19 | 261.69 | 261.69 | 261.69 | 261.69 | 1.51K | 9.33%    |
| Oct 19 | 239.36 | 239.36 | 239.36 | 239.36 | 0.51K | 0.55%    |
| Sep 19 | 238.05 | 238.05 | 238.05 | 238.05 | 1.78K | -15.62%  |
| Aug 19 | 282.11 | 282.11 | 282.11 | 282.11 | 0.90K | %        |
| Jul 19 | 294.84 | 294.84 | 294.84 | 294.84 |       | %        |
| Jun 19 | 288.53 | 288.53 | 288.53 | 288.53 |       | %        |
| May 19 | 298.50 | 298.50 | 298.50 | 298.50 |       | -3.69%   |
| Apr 19 | 309.95 | 309.95 | 309.95 | 309.95 |       |          |

IBM, Lockheed Martin Fall  
Premarket; NCR, Halliburton  
Rise

Steel Scrap Futures Discussions

| Date            | Price  | Open           | High   | Low                | Vol.   | Change %        |
|-----------------|--------|----------------|--------|--------------------|--------|-----------------|
| Mar 19          | 320.74 | 320.74         | 320.74 | 320.74             | 1.00K  | 0.09%           |
| Feb 19          | 320.44 | 320.44         | 320.44 | 320.44             | 1.49K  | 10.76%          |
| Jan 19          | 289.30 | 289.30         | 289.30 | 289.30             | 2.24K  | -3.52%          |
| Dec 18          | 299.87 | 299.87         | 299.87 | 299.87             | 3.96K  | -9.47%          |
| Nov 18          | 331.24 | 331.24         | 331.24 | 331.24             | 3.98K  | 0.46%           |
| Oct 18          | 329.72 | 329.72         | 329.72 | 329.72             | 1.89K  | 2.91%           |
| Sep 18          | 320.40 | 320.40         | 320.40 | 320.40             | 12.42K | 2.71%           |
| Aug 18          | 311.95 | 311.95         | 311.95 | 311.95             | 3.47K  | -8.68%          |
| Jul 18          | 341.61 | 341.61         | 341.61 | 341.61             | 1.01K  | -1.73%          |
| Jun 18          | 347.62 | 347.62         | 347.62 | 347.62             | 2.58K  | -0.20%          |
| May 18          | 348.30 | 348.30         | 348.30 | 348.30             | 7.58K  | -0.75%          |
| Apr 18          | 350.93 | 350.93         | 350.93 | 350.93             | 3.59K  | -5.66%          |
| Mar 18          | 372.00 | 372.00         | 372.00 | 372.00             | 2.03K  | 5.38%           |
| Feb 18          | 353.00 | 353.00         | 353.00 | 353.00             | 9.37K  | -3.05%          |
| Jan 18          | 364.11 | 364.11         | 364.11 | 364.11             | 3.57K  | 2.50%           |
| Dec 17          | 355.24 | 355.24         | 355.24 | 355.24             | 2.51K  | 4.02%           |
| Nov 17          | 341.50 | 341.50         | 341.50 | 341.50             | 8.57K  | 6.72%           |
| Oct 17          | 320.00 | 320.00         | 320.00 | 320.00             | 8.18K  | 6.49%           |
| Sep 17          | 300.50 | 300.50         | 300.50 | 300.50             | 4.77K  | -14.27%         |
| Aug 17          | 350.50 | 350.50         | 350.50 | 350.50             | 2.60K  | 4.63%           |
| Highest: 638.00 |        | Lowest: 224.00 |        | Difference: 414.00 |        | Average: 361.12 |
|                 |        |                |        |                    |        | Change %: 19.40 |

\$361/ton - 5-Year  
Average for Steel

IBM, Lockheed Martin Fall  
Premarket; NCR, Halliburton  
Rise

# Copper Futures - Sep 22 (HGU2)

Real-time capital.com

Add to Watchlist

Create Alert

Type:Commodity

Group:Metals

Unit:1 Pound

3.2618 -0.0842 (-2.52%)

09:10:20 - Real-time derived data. Currency in USD ( Disclaimer )

Prev. Close: 3.3460    Open: 3.3145    Day's Range: 3.2570 - 3.3270

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## Copper Futures Historical Data

Time Frame: Monthly

Download Data07/07/2017 - 07/07/2022

| Date   | Price  | Open   | High   | Low    | Vol.    | Change % |
|--------|--------|--------|--------|--------|---------|----------|
| Jul 22 | 3.2645 | 3.6900 | 3.7022 | 3.1322 | 0.48K   | -12.11%  |
| Jun 22 | 3.7145 | 4.2855 | 4.5770 | 3.6400 | 1.15M   | -13.54%  |
| May 22 | 4.2960 | 4.3930 | 4.4400 | 4.0370 | 1.08M   | -2.55%   |
| Apr 22 | 4.4085 | 4.7245 | 4.8615 | 4.3715 | 664.48K | -7.30%   |
| Mar 22 | 4.7555 | 4.5010 | 5.0100 | 4.4710 | 196.77K | 6.77%    |
| Feb 22 | 4.4540 | 4.3200 | 4.6860 | 4.3180 | 107.52K | 3.01%    |
| Jan 22 | 4.3240 | 4.4480 | 4.5815 | 4.2880 | 86.72K  | -2.67%   |
| Dec 21 | 4.4425 | 4.3355 | 4.4645 | 4.1105 | 41.59K  | 4.09%    |
| Nov 21 | 4.2680 | 4.3335 | 4.4925 | 4.1930 | 31.98K  | -1.03%   |
| Oct 21 | 4.3125 | 4.1475 | 4.7075 | 4.1000 | 40.86K  | 6.38%    |
| Sep 21 | 4.0540 | 4.2760 | 4.4135 | 4.0300 | 13.79K  | -6.48%   |
| Aug 21 | 4.3350 | 4.4165 | 4.4230 | 3.9760 | 11.24K  | -2.12%   |
| Jul 21 | 4.4290 | 4.2700 | 4.5060 | 4.1900 | 3.43K   | 3.64%    |
| Jun 21 | 4.2735 | 4.6900 | 4.6900 | 4.1725 | 1.37K   | -8.61%   |
| May 21 | 4.6760 | 4.4400 | 4.7380 | 4.4400 | 1.01K   | 5.60%    |
| Apr 21 | 4.4280 | 4.0700 | 4.4505 | 3.9790 | 0.68K   | 11.75%   |
| Mar 21 | 3.9625 | 4.0665 | 4.0875 | 3.9850 | 0.59K   | -1.50%   |
| Feb 21 | 4.0230 | 4.0270 | 4.0435 | 4.0270 | 0.08K   | 14.14%   |
| Jan 21 | 3.5245 | 3.6900 | 3.6900 | 3.6900 | 0.02K   | 0.17%    |
| Dec 20 | 3.5185 | 3.5075 | 3.6240 | 3.5075 | 0.00K   | 2.09%    |
| Nov 20 | 3.4465 | 3.1810 | 3.1810 | 3.1810 | 0.01K   | 12.03%   |
| Oct 20 | 3.0765 | 3.0480 | 3.2025 | 2.8565 | 0.01K   | 0.41%    |
| Sep 20 | 3.0640 | 3.0530 | 3.0530 | 3.0530 | 0.03K   | -1.32%   |
| Aug 20 | 3.1050 | 2.8995 | 3.0880 | 2.8270 | 0.00K   | 5.52%    |
| Jul 20 | 2.9425 | 2.7465 | 3.0095 | 2.7465 | 0.03K   | 5.03%    |
| Jun 20 | 2.8015 | 2.4800 | 2.7565 | 2.4800 | 0.01K   | 10.93%   |
| May 20 | 2.5255 | 2.3435 | 2.5045 | 2.3435 | 0.00K   | 4.27%    |
| Apr 20 | 2.4220 | 2.2480 | 2.4225 | 2.2150 | 0.01K   | 5.42%    |
| Mar 20 | 2.2975 | 2.5525 | 2.5615 | 2.1350 | 0.74K   | -12.02%  |
| Feb 20 | 2.6115 | 2.5945 | 2.6560 | 2.5555 | 0.77K   | 0.64%    |
| Jan 20 | 2.5950 | 2.8180 | 2.8180 | 2.5580 | 0.10K   | -8.98%   |
| Dec 19 | 2.8510 | 2.8350 | 2.8350 | 2.8350 | 0.08K   | 4.68%    |
| Nov 19 | 2.7235 | 2.7685 | 2.7685 | 2.7405 | 0.04K   | 0.80%    |
| Oct 19 | 2.7020 | 2.6920 | 2.6920 | 2.6920 | 0.03K   | 1.85%    |
| Sep 19 | 2.6530 | 2.6370 | 2.6370 | 2.6370 | 0.00K   | 1.11%    |
| Aug 19 | 2.6240 | 2.6080 | 2.6080 | 2.6080 | 0.03K   | -4.60%   |
| Jul 19 | 2.7505 | 2.7345 | 2.7345 | 2.7345 | 0.02K   | -1.36%   |
| Jun 19 | 2.7885 | 2.7740 | 2.7740 | 2.7740 | 0.02K   | 3.01%    |
| May 19 | 2.7070 | 2.6910 | 2.6910 | 2.6910 | 0.02K   | -9.10%   |
| Apr 19 | 2.9780 | 2.9715 | 2.9715 | 2.9715 |         |          |

Copper Futures Discussions

| Date            | Price  | Open           | High   | Low                | Vol.    | Change %         |
|-----------------|--------|----------------|--------|--------------------|---------|------------------|
| Mar 19          | 2.9805 | 2.9745         | 2.9745 | 2.9745             | 0.01K   | -0.10%           |
| Feb 19          | 2.9835 | 2.9805         | 2.9805 | 2.9805             | 0.01K   | 5.16%            |
| Jan 19          | 2.8370 | 2.8340         | 2.8340 | 2.8340             | 0.02K   | 5.96%            |
| Dec 18          | 2.6775 | 2.6745         | 2.6745 | 2.6745             | 0.19K   | -5.12%           |
| Nov 18          | 2.8220 | 2.8190         | 2.8190 | 2.8190             | 0.02K   | 2.49%            |
| Oct 18          | 2.7535 | 2.7505         | 2.7505 | 2.7505             | 237.35K | -4.48%           |
| Sep 18          | 2.8825 | 2.8795         | 2.8795 | 2.8795             | 181.25K | 3.61%            |
| Aug 18          | 2.7820 | 2.7790         | 2.7790 | 2.7790             | 903.62K | -5.97%           |
| Jul 18          | 2.9585 | 2.9555         | 2.9555 | 2.9555             | 16.68K  | -3.84%           |
| Jun 18          | 3.0765 | 3.0735         | 3.0735 | 3.0735             | 24.31K  | -3.75%           |
| May 18          | 3.1965 | 3.1935         | 3.1935 | 3.1935             | 16.57K  | -0.22%           |
| Apr 18          | 3.2035 | 3.2005         | 3.2005 | 3.2005             | 22.95K  | 1.52%            |
| Mar 18          | 3.1555 | 3.1525         | 3.1525 | 3.1525             | 16.16K  | -2.89%           |
| Feb 18          | 3.2495 | 3.2465         | 3.2465 | 3.2465             | 27.16K  | -1.78%           |
| Jan 18          | 3.3085 | 3.3055         | 3.3055 | 3.3055             | 10.10K  | -2.29%           |
| Dec 17          | 3.3860 | 3.3830         | 3.3830 | 3.3830             | 16.90K  | 8.16%            |
| Nov 17          | 3.1305 | 3.1275         | 3.1275 | 3.1275             | 27.22K  | -1.57%           |
| Oct 17          | 3.1805 | 3.1775         | 3.1775 | 3.1775             | 10.72K  | 4.66%            |
| Sep 17          | 3.0390 | 3.0360         | 3.0360 | 3.0360             | 21.08K  | -3.98%           |
| Aug 17          | 3.1650 | 3.1620         | 3.1620 | 3.1620             | 26.32K  | 6.30%            |
| Highest: 5.0100 |        | Lowest: 2.1350 |        | Difference: 2.8750 |         | Average: 3.3316  |
|                 |        |                |        |                    |         | Change %: 9.6390 |

\$3.33/lb - 5-Year  
Average for  
Copper

Aluminium - (MAL3)

 Real-time capital.com

2,386.00

-49.00

(-2.01%)

11:40:30 - Real-time derived data. Currency in USD ( [Disclaimer](#) )

[Add to Watchlist](#)

[Create Alert](#)

Type:

Commodity

Group:

Metals

Unit:

1 Tonne

Prev. Close: 2,435.00    Open: 2,410.50    Day's Range: 2,384.00 - 2,434.00

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- [Overview](#)   [Historical Data](#)

Aluminium Historical Data

Time Frame:  
Monthly 

[Download Data](#)   07/29/2017 - 07/19/2022 

| Date   | Price    | Open     | High     | Low      | Vol.    | Change % |
|--------|----------|----------|----------|----------|---------|----------|
| Jul 22 | 2,395.00 | 2,422.50 | 2,485.00 | 2,311.00 | -       | -2.07%   |
| Jun 22 | 2,445.50 | 2,740.00 | 2,797.00 | 2,420.50 | 864.33K | -12.25%  |
| May 22 | 2,787.00 | 2,945.00 | 2,973.00 | 2,715.00 | 759.99K | -8.70%   |
| Apr 22 | 3,052.50 | 3,499.00 | 3,497.00 | 3,044.00 | 631.08K | -12.56%  |
| Mar 22 | 3,491.00 | 3,463.00 | 3,966.00 | 3,254.00 | 1.10M   | 3.64%    |
| Feb 22 | 3,368.50 | 3,049.00 | 3,445.00 | 3,028.00 | 1.12M   | 11.50%   |
| Jan 22 | 3,021.00 | 2,825.00 | 3,095.00 | 2,821.00 | 856.27K | 7.60%    |
| Dec 21 | 2,807.50 | 2,648.00 | 2,842.00 | 2,585.00 | 828.04K | 6.95%    |
| Nov 21 | 2,625.00 | 2,732.00 | 2,734.00 | 2,522.00 | 865.85K | -3.37%   |
| Oct 21 | 2,716.50 | 2,881.00 | 3,198.00 | 2,695.00 | 1.26M   | -4.68%   |
| Sep 21 | 2,849.75 | 2,685.88 | 2,955.25 | 2,673.32 | 2.42K   | 9.16%    |
| Aug 21 | 2,610.50 | 2,628.50 | 2,703.74 | 2,539.75 | 0.44K   | 2.23%    |
| Jul 21 | 2,553.50 | 2,501.75 | 2,620.25 | 2,412.00 | -       | 1.35%    |
| Jun 21 | 2,519.50 | 2,484.01 | 2,549.00 | 2,345.75 | 0.54K   | 2.14%    |
| May 21 | 2,466.76 | 2,423.00 | 2,525.24 | 2,340.89 | -       | 3.19%    |
| Apr 21 | 2,390.50 | 2,209.75 | 2,414.43 | 2,194.25 | -       | 8.94%    |
| Mar 21 | 2,194.25 | 2,103.38 | 2,284.00 | 2,085.63 | 1.53K   | 1.44%    |
| Feb 21 | 2,163.00 | 1,964.13 | 2,215.63 | 1,956.63 | 1.91K   | 9.64%    |
| Jan 21 | 1,972.88 | 2,025.50 | 2,049.25 | 1,953.80 | 0.69K   | -1.51%   |
| Dec 20 | 2,003.12 | 2,055.38 | 2,068.25 | 1,964.00 | 2.28K   | -1.92%   |
| Nov 20 | 2,042.25 | 1,876.75 | 2,041.38 | 1,853.50 | 0.91K   | 10.18%   |
| Oct 20 | 1,853.50 | 1,737.75 | 1,861.00 | 1,709.75 | -       | 6.54%    |
| Sep 20 | 1,739.75 | 1,771.50 | 1,789.50 | 1,713.78 | -       | -1.79%   |
| Aug 20 | 1,771.50 | 1,715.50 | 1,780.49 | 1,683.50 | 0.60K   | 4.67%    |
| Jul 20 | 1,692.50 | 1,598.00 | 1,701.99 | 1,584.25 | 0.05K   | 6.20%    |
| Jun 20 | 1,593.75 | 1,524.50 | 1,610.39 | 1,517.50 | 0.07K   | 4.56%    |
| May 20 | 1,524.25 | 1,458.50 | 1,534.50 | 1,428.05 | -       | 3.16%    |
| Apr 20 | 1,477.50 | 1,501.50 | 1,501.50 | 1,426.50 | 0.19K   | -1.60%   |
| Mar 20 | 1,501.50 | 1,711.50 | 1,726.00 | 1,501.75 | 3.08K   | -10.94%  |
| Feb 20 | 1,686.00 | 1,679.00 | 1,732.00 | 1,663.75 | 0.56K   | -2.09%   |
| Jan 20 | 1,722.00 | 1,782.50 | 1,814.13 | 1,703.75 | 0.28K   | -3.76%   |
| Dec 19 | 1,789.25 | 1,799.75 | 1,810.25 | 1,745.63 | 1.82K   | 0.52%    |
| Nov 19 | 1,780.00 | 1,792.25 | 1,828.27 | 1,736.25 | 0.65K   | 1.05%    |
| Oct 19 | 1,761.50 | 1,725.75 | 1,768.00 | 1,689.75 | -       | 3.16%    |
| Sep 19 | 1,707.50 | 1,729.25 | 1,805.45 | 1,706.00 | 0.26K   | -1.44%   |
| Aug 19 | 1,732.50 | 1,759.50 | 1,789.50 | 1,722.75 | 0.51K   | -2.79%   |
| Jul 19 | 1,782.25 | 1,774.50 | 1,855.25 | 1,760.50 | 0.22K   | 0.00%    |
| Jun 19 | 1,782.25 | 1,754.50 | 1,814.25 | 1,728.75 | 0.45K   | 0.27%    |
| May 19 | 1,777.50 | 1,800.25 | 1,855.25 | 1,757.50 | 0.20K   | 0.25%    |
| Apr 19 | 1,773.00 | 1,880.50 | 1,908.01 | 1,773.00 | 0.25K   | -6.70%   |
| Mar 19 | 1,900.25 | 1,893.00 | 1,936.00 | 1,819.75 |         |          |

Aluminium Futures Discussions

| Date              | Price    | Open             | High                 | Low      | Vol.              | Change %        |
|-------------------|----------|------------------|----------------------|----------|-------------------|-----------------|
| Feb 19            | 1,894.75 | 1,867.25         | 1,919.50             | 1,820.25 | 0.33K             | -0.33%          |
| Jan 19            | 1,901.00 | 1,777.75         | 1,914.50             | 1,764.00 | 0.40K             | 4.29%           |
| Dec 18            | 1,822.75 | 1,981.25         | 1,990.90             | 1,816.75 | 1.15K             | -7.32%          |
| Nov 18            | 1,966.75 | 1,964.25         | 1,994.25             | 1,908.50 | 0.70K             | 1.01%           |
| Oct 18            | 1,947.00 | 2,075.50         | 2,242.00             | 1,897.50 | 1.49K             | -5.30%          |
| Sep 18            | 2,056.00 | 2,104.50         | 2,109.50             | 1,999.00 | 0.91K             | -2.54%          |
| Aug 18            | 2,109.50 | 2,040.75         | 2,157.25             | 2,007.50 | 1.05K             | 2.04%           |
| Jul 18            | 2,067.25 | 2,126.25         | 2,151.75             | 1,990.25 | 0.06K             | -4.47%          |
| Jun 18            | 2,164.00 | 2,304.50         | 2,341.25             | 2,155.75 | 0.48K             | -5.84%          |
| May 18            | 2,298.25 | 2,251.75         | 2,381.00             | 2,251.75 | 0.53K             | 1.54%           |
| Apr 18            | 2,263.50 | 1,983.00         | 2,556.00             | 1,983.00 | 1.07K             | 13.70%          |
| Mar 18            | 1,990.75 | 2,153.00         | 2,153.00             | 1,990.25 | 2.09K             | -6.52%          |
| Feb 18            | 2,129.50 | 2,235.50         | 2,238.25             | 2,119.25 | 3.37K             | -4.23%          |
| Jan 18            | 2,223.50 | 2,253.50         | 2,266.00             | 2,138.50 | 0.69K             | -1.54%          |
| Dec 17            | 2,258.25 | 2,063.00         | 2,272.00             | 1,993.75 | 1.20K             | 11.08%          |
| Nov 17            | 2,033.00 | 2,159.75         | 2,173.35             | 2,029.50 | 6.06K             | -5.28%          |
| Oct 17            | 2,146.25 | 2,083.50         | 2,180.25             | 2,083.50 | 0.33K             | 3.14%           |
| Sep 17            | 2,081.00 | 2,076.00         | 2,173.63             | 2,072.75 | 0.81K             | -1.06%          |
| Aug 17            | 2,103.25 | 1,890.75         | 2,114.00             | 1,890.75 | 0.21K             | 10.71%          |
| Highest: 3,966.00 |          | Lowest: 1,426.50 | Difference: 2,539.50 |          | Average: 2,138.00 | Change %: 26.07 |

\$2,138/tonne =  
\$0.97/lb - 5-Year  
Average for Aluminum



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SMI NORTH AMERICA

SMI CHINA

SMI INDIA

SMI EUROPE

Copper Transformer Scrap Price

ISRI CODE : [NA](#)

Material Category : [Copper Scrap](#)



0.45 \$US/Lb

14 Apr 2022

Discounted by 25% to  
account for handling.

| Price Change | Change% | Month High | Month Low | Year High | Year Low |
|--------------|---------|------------|-----------|-----------|----------|
| 0            | 0%      | 0.39       | 0.33      | 0.48      | 0.33     |

The scrap metal prices displayed are three months old. For live prices,Subscribe to Premium

| North America                  | USA East Coast                 | USA Midwest                    | USA West Coast                 |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 0.45 \$US/Lb                   | 0.45 \$US/Lb                   | 0.44 \$US/Lb                   | 0.46 \$US/Lb                   |
| High: 0.47 (Year) 0.38 (Month) | High: 0.47 (Year) 0.38 (Month) | High: 0.46 (Year) 0.37 (Month) | High: 0.48 (Year) 0.39 (Month) |
| Low: 0.34 (Year) 0.34 (Month)  | Low: 0.34 (Year) 0.34 (Month)  | Low: 0.33 (Year) 0.33 (Month)  | Low: 0.35 (Year) 0.35 (Month)  |

Copper Transformer Scrap Historical Prices \*Available since Mar,2012.

Start Date

End Date

View Prices



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Disc



# Salvage and Reuse Value Analysis

This Salvage and Reuse Value Analysis has been prepared for the [REDACTED] being developed by [REDACTED]. This value analysis is supported by our contractual obligation to purchase the detailed equipment discussed herein at the valuation stated within this document, within one year of this analysis. We feel this will provide assurances related to the potential scrap value of the modules used in current US dollars.

The solar modules considered for this study include: [REDACTED] solar modules manufactured by Canadian Solar (in China and Thailand), Model Number: [REDACTED]

We Recycle Solar is innovating lifecycle management within the solar industry, and is uniquely qualified to assess the residual value of end-of-life solar equipment. We Recycle Solar extends the useful life of solar modules via redeployment, remarketing, and charitable donations. Those that can't be reused are dismantled, shred, and refined—returning them to the raw commodities required to manufacture new modules.

We Recycle Solar services major manufacturers such as First Solar, LG Electronics, SolarTech Universal, and SunPower; investor-owned utilities (IOUs), operations and maintenance providers (O&M), and various solar contractors throughout North America. Our certified processes include visual and physical inspection, electrical safety testing, performance testing, thermography, panel disassembly, materials separation and recovery, and panel characterization sampling. There are multiple factors that can affect the salvage and/or reuse value for solar modules at anticipated end-of-life, which can be a significant factor in the decommissioning cost estimates prepared (such as the decommissioning cost estimate being supported by this document).

To determine the overall value of the solar modules from an installation, it is compulsory to understand the factors influencing the residual value in the solar modules as well as the rates of failure over the life of the installation.

## Determining Solar Module Residual Value

To best understand the value of the solar module at any point in the life of that module, one must consider many factors. In development of this valuation we are considering the following factors:

1. The overall market prices for solar modules should be considered globally. This is influenced by two sub-factors:
  - a. Reduction of the mass of raw materials used in manufacturing solar modules.
  - b. The overall changes to the prices of solar modules over time.

As R&D and technological advances continue with a maturing industry, the composition of a typical PV module is expected to require fewer raw materials.



# Salvage and Reuse Value Analysis

As far as costs of solar panels changing over time, the maturity of the technology and the market will reduce prices over time. It should be noted that tariffs and other international trade concerns may put additional artificial pressure on the prices. We are not able to assess these cost considerations and feel it is more conservative in detailing the valuation (lower value) by not including these costs.

A recent report by the National Renewables Engineering Laboratory (NREL) in 2018<sup>1</sup> has modeled the costs of different solar technologies and also developed predicted costs of modules in the future. This report has indicated that the minimum sustainable price (MSP) of Mono-Crystalline PERC Solar Modules manufactured in Urban China was \$0.37 / W in the first half of 2018. *This report anticipates a MSP of \$0.28 / W expected in 2020. For the purposes of this study we only considered the 2020 MSP.*

2. The type and wattage of the module. These factors are typically driven by end-user desires and typically only affect pricing on the reuse/repurposing market if they are less than 290 watt or are manufactured in a manner that may create hazardous waste at end of life. *Neither of these cases appear to apply for this analysis.*
3. Brand Recognition: the top tier name brands typically command higher prices. *The modules addressed in this valuation are certainly a top tier brand.*
4. Reuse Potential: rapid global PV growth may result in an associated secondary market for panel components and materials. Even operational but underperforming panels by standards of the first owner may meet expectations of a second owner. *For the purposes of this valuation we consider the base cost for reuse in the secondary market, can range in valuation (when transferring from installation owner/operator to credible reuse and recycling firms) from 5% to 30% of original market value as a retail price on the secondary market.* This pricing is driven by the amount of testing required to re-market the modules with the appropriate certifications in place, packaging for safe transportation, and transportation costs to the testing facility.

However, it should be noted there are several concerns that complicate secondary markets, such as product safety, voiding of warranties, future liability, voiding of feed-in-tariff agreements, and balance-of-system costs. We did not consider the reuse of the early failures in the lifetime of a module repair and reuse opportunities. Potentially, repaired PV modules can be resold on the world market at a reduced market price.



# Salvage and Reuse Value Analysis

## Solar Module Valuation

| Used Solar Module Prices Within Five Year Period<br>Estimated for Canadian Solar [REDACTED] |                |                |
|---------------------------------------------------------------------------------------------|----------------|----------------|
|                                                                                             | 2021           | 2026           |
| Depreciation for Undamaged                                                                  | 0.00%          | 22.50%         |
| Undamaged Module (\$/W)                                                                     | \$0.0875       | \$0.0678125    |
| Undamaged Module Value                                                                      | \$35.00        | \$27.13        |
| Total Valuation                                                                             | \$9,514,050.00 | \$7,374,747.90 |

*For the purposes of this valuation, given the above factors, we would value the reusable panels for our purchase at \$35.00/module (\$0.0875/W) delivered to our New York processing plant. We consider the decline in potential price over the life of the panel (until there is zero value in a straight-line depreciation over 20 years. We are electing to use the MACRS Percentage Table Guide in IRS publication 946 to determine the rate of depreciation over the years.*

*Applicable to this study is the year 1 to 5 depreciation rates, which start in year one with a 2.5% reduction, and 5% per year thereafter. This depreciation is a percentage of what we estimate the original value to be. Therefore, at the 5-year point the total depreciation will be 22.5% of the original value as a reusable item (basis cost in tax terms).*

Prepared By:

A handwritten signature in black ink, appearing to read "D Clark".

Dwight Clark, Chief Compliance Officer  
We Recycle Solar, Inc.  
December 4, 2019

### References:

<sup>1</sup>Woodhouse, Michael. Brittany Smith, Ashwin Ramdas, and Robert Margolis. 2019. Crystalline Silicon Photovoltaic Module Manufacturing Costs and Sustainable Pricing: 1H 2018 Benchmark and Cost Reduction Roadmap. Golden, CO: National Renewable Energy Laboratory. <https://www.nrel.gov/docs/fy19osti/72134.pdf>.