APPENDIX J

Decommissioning/Reclamation Plan

Trapper Solar Project Decommissioning/Reclamation Plan

MAY 2024

PREPARED FOR

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TRAPPER SOLAR PROJECT
DECOMISSIONING/RECLAMATION PLAN

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CONTENTS

Figure

Tables

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1 INTRODUCTION

RWE Solar Development, LLC (RWE) proposes to construct the Trapper Solar Project (Project) in Routt County, Colorado. The Project consists of an up to 250-megawatt (MW) alternating current utility-scale solar energy system, an up to 125-MW (4-MW/hour storage energy capacity) battery energy storage system (BESS), and ancillary facilities. The Project would sit on about 3,030 acres of private and state-owned land in Routt County, Colorado, about 1.5 miles south of Hayden (Project area). Project components would include solar panels mounted on trackers arranged in multiple arrays, transformers, direct current to alternating current inverters, a collection system that connects the arrays to a BESS, a substation, an operations and maintenance (O&M) building, a switchyard, and a short transmission line interconnecting the Project's generated power to the existing transmission infrastructure located on the southeast portion of the Project area. RWE submits this decommissioning/reclamation plan for the Project in accordance with Section 3.1.D.27 of Routt County's Unified Development Code Resolution 2023-P-083 (the Code).

1.1 Triggering Events and Expected Lifetime of Project

Project decommissioning may be initiated by specific events such as the termination of the power purchase agreement or the completion of the Project's operational life cycle. Furthermore, in compliance with the Code, decommissioning would commence no later than 12 months after power is disconnected or loss of lease for the land in the Project area.

The anticipated lifespan of a utility-scale solar facility, if properly maintained, typically ranges between 25 to 35 years. However, with strategic equipment replacement and repowering, the lifespan could be extended to 50 years or more. Flexibility exists for retrofitting the solar arrays with updated components, such as panels, frames, and tracking systems, to prolong the Project's viability. In instances where retrofitting is not pursued or upon reaching the end of the Project's useful life, decommissioning entails the removal of panels and associated components from the Project area.

The value of individual components within the solar facility fluctuates over time. Generally, the highest component value is realized during the construction phase, gradually declining over the Project's lifecycle. Throughout most of the Project's duration, components such as solar panels can be resold in the wholesale market for reuse or refurbishment. As panels age or endure weathering, their efficiency and power production decrease, resulting in a corresponding decline in resale value. Secondary markets for used solar components cater to other utility-scale solar facilities with similar designs requiring replacement equipment due to damage or wear over time, as well as other buyers (such as developers and consumers) who are seeking a cost-effective option with a slightly reduced power output compared to new equipment.

Components of the solar facility retaining resale value may be marketed in the wholesale market, while those lacking resale value will undergo salvage for recycling or disposal at an approved off-site licensed solid waste disposal facility (landfill). Decommissioning activities encompass the removal of arrays and associated components, as detailed in Section 2.

1.2 Decommissioning Sequence

Decommissioning/reclamation would commence according to the timelines specified in Section 3.1.D.27.a.ii of the Code. Decommissioning activities are slated to commence within 12 months of the cessation of Project operations. Decommissioning and reclamation activities must be completed within 24 months of the start of decommissioning work. RWE assumes responsibility for these tasks. Continuous

monitoring and site restoration efforts may extend beyond this period to ensure the successful revegetation and rehabilitation of the area. Although there may be an overlap of activities, the anticipated sequence of decommissioning and removal is outlined below:

1. Assess and reinforce access roads, if necessary, and prepare the site for component removal.
2. Implement erosion control measures, including the installation of fencing and other best management practices (BMPs), to safeguard sensitive resources and mitigate erosion during decommissioning activities.
3. De-energize the solar arrays.
4. Dismantle panels and racking.
5. Remove frames and internal components.
6. Excavate portions of structural foundations to a depth of at least 3 feet (36 inches) below the surface and backfill the sites as necessary.
7. Remove inverter stations and associated foundations.
8. Extract electrical cables and conduits to a depth of at least 3 feet (36 inches) below the surface.
9. Remove BESS equipment and associated foundations.
10. Demolish access and internal roads and grade the site as required.
11. Disassemble the substation.
12. Eliminate overhead transmission lines and poles.
13. De-compact subsoils as needed and restore and revegetate disturbed land to preconstruction conditions to the extent feasible.

It is important to note that while the outlined sequence provides a structured approach, flexibility is maintained to accommodate any variations in the decommissioning process and to ensure effective execution.

To enable agricultural usage pursuant to Section 3.1.D.27.a.i of the Code; following the removal of the Project's solar energy system, agricultural lands will be restored in accordance with the Project's Vegetation Establishment and Management Plan, submitted to Routt County under a separate cover.

2 DECOMMISSIONING/RECLAMATION

This section outlines the solar facility components and decommissioning activities required to restore the Project area, as closely as practicable, to its preconstruction conditions.

2.1 Overview of Solar Facility System

RWE anticipates using approximately 489,549 solar modules, with a total nameplate generating capacity of approximately 250 MW. The Project area encompasses approximately 3,030 acres. The generating facilities will be placed within approximately 1,533 acres bounded by perimeter fencing as shown on Figure 1 (preliminary design; subject to modification). The land within the perimeter fencing is predominantly agricultural land. Statistics and estimates provided in this plan are based on a Vertex N 690-watt bifacial dual glass module or similar as the final panel manufacturer has not been selected at the time of this report.

Collection cabling will be installed below the surface at a depth of approximately 4 feet (48 inches). Foundations, steel piles, and electric cabling and conduit less than 3 feet (36 inches) below the soil surface will be removed, in accordance with Section 3.1.D.27.a.iii of the Code. Components and cabling deeper than 36 inches below the surface may be abandoned in place. Access roads may be left in place if requested and/or agreed to by the landowner in writing; however, for the purposes of this assessment, it is assumed that Project access roads will be removed. Public roads, if damaged or modified during the decommissioning and reclamation process, will be repaired upon completion of the decommissioning phase. An estimated cost of public road repair is included in Section 4.1.

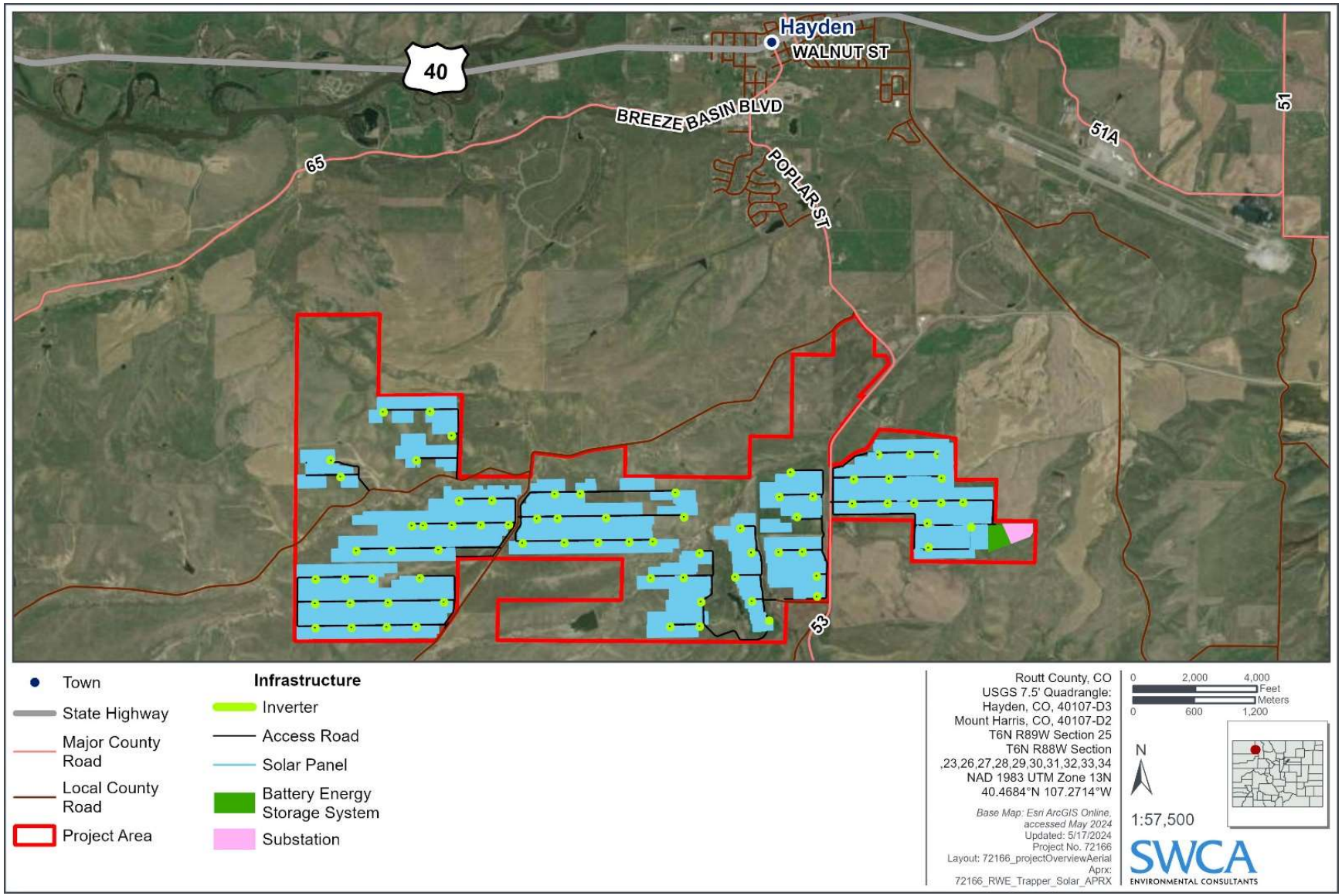

Figure 1: Site layout.

Estimated quantities of materials to be removed and salvaged or disposed of are included in this section (Table 1). Many of the materials described have salvage value; however, there are some components that will likely have no value at the time of decommissioning. Removed materials will be salvaged or recycled to the extent practicable. Other waste materials will be disposed of in accordance with federal and state laws in an approved licensed solid waste facility. Solar panels may have value in a resale market, depending on their condition at the end of the Project life. If the Project is decommissioned prior to the anticipated 35-year time frame, the resale value of components may be substantially higher than at the end of the Project's projected life.

Table 1. Summary of the Primary Components of the Project Included in this Decommissioning/Reclamation Plan

Component	Quantity*	Unit of Measure
Solar Array		
Solar modules	489,549	Each
Tracking system	5,858	Each
Steel piles	68,217	Each
Inverters	73	Each
Electrical cables and conduit	50,000	Linear feet
Perimeter fencing	142,503	Linear feet
Fence posts	14,250	Each
Access road	84,942	Linear feet
Substation	1	Each
Transmission Line		
Transmission poles	4	Each
Length of transmission cable	1,500	Linear feet
BESS		
Battery container modules	153	Each
Battery racks	765	Each
BESS cables	25,000	Linear feet
Transformers	41	Each

* Quantities are approximate.

2.2 Solar Modules

RWE is deliberating the adoption of the Vertex N bifacial dual glass panel (690 watts) from Trina Solar or a comparable module from other manufacturers for the Project. Each module assembly (including frame) weighs approximately 84.4 pounds (38.3 kg) and measures about 94 inches × 51 inches. These modules, which are composed mainly of non-metallic materials such as silicon, glass, composite film, plastic, and epoxies and have an anodized aluminum frame, constitute the solar array.

At decommissioning, modules in operational condition may undergo refurbishment and may be sold in the secondary market, yielding higher revenue compared to selling them as salvage material. Non-functional modules will be shipped to either the manufacturer or a third party for recycling or disposal.

2.3 Tracking System and Support

The solar modules will be affixed to a single-axis tracking system, such as the NH Horizon XRT manufactured by Nextracker, or an equivalent system. Each full, three-string tracker, approximately 283 feet (85 m) in length, will support 87 solar modules. Smaller two-string trackers, accommodating 58 panels each, will be deployed at the periphery of the layout to optimize space. Composed mainly of high-strength galvanized steel and anodized aluminum, with steel piles supporting the system, the tracking system will be deactivated and disassembled during decommissioning. Salvageable materials from the supports, tracking system, and posts can be sold to generate revenue offsetting decommissioning costs. Non-salvageable materials will be sent for proper disposal as identified by the waste management team at the time of decommissioning.

2.4 Inverter Stations and Transformers

The Project will use 73 SMA SCS 3950 UP-XT-US inverters spread throughout the solar array. Each inverter station will be on a small gravel platform supported by steel piles within the array. During decommissioning, each inverter will be deactivated, disassembled, and removed. It is assumed for this report that piers with steel piles will be employed. Depending on their condition, the equipment may be refurbished for reuse or salvaged. If not repurposed, they will be disposed of at an approved waste management facility.

The Project will also have 41 4,400-kilovolt transformers to support the array and BESS. During decommissioning, the transformers will be deactivated, drained of any fluids for disposal, and dissembled, and salvable material will be recycled. The remaining components will be disposed of properly by the waste management team.

2.5 Electrical Cabling and Conduits

The Project's underground electrical collection system will be buried approximately 4 feet (48 inches) below the ground surface. Cabling at or above 3 feet will be salvaged, while deeper cables will be abandoned in place. No recovery cost has been assumed for the collection cabling, although it is likely to hold salvage value at removal.

2.6 Project Substation

The Project substation will be located in the southeast corner of the Project area adjacent to the existing transmission lines. The Project substation will encompass an approximately 240 × 255–foot footprint and will house a gravel pad, power transformer and footings, and electrical control house with concrete foundations. Salvageable components of the substation, such as the transformer, may be sold for reuse. Unsalvageable parts will be transported off-site for disposal.

2.7 Battery Energy Storage System

An approximately 5- to 10-acre area will be used to house the 125-MW (4-MW/hour storage energy capacity) BESS (see Figure 1). The BESS consists of 153 CATL EnerC+ Battery containers; these containers will be grouped in rows and have the appearance of steel sheds. The batteries will be supported on 765 battery racks. Prior to disassembly, the batteries will be de-energized and sold for reuse or will be

recycled at a battery facility identified by the waste management team. The battery racking and steel housing will be sold as scrap.

2.8 Operations and Maintenance Building

RWE will construct an approximately 1,300-square-foot building for O&M. The building will be sold at the end of the Project life; therefore, no O&M building removal is included in this Plan.

2.9 Perimeter Fencing and Access Roads

The Project area will include a security fence around the Project infrastructure (e.g., solar arrays, BESS, and substation). The fence will total approximately 142,503 feet in length. Access roads will provide direct access to the solar facility from local roads and along the inner perimeter of the arrays. Internal roads will be located within the array to allow access to the equipment. The Project access drives will be approximately 16 feet wide and total approximately 84,942 feet (16 miles) in length. The access road lengths may change with final Project design. To be conservative, the decommissioning estimate assumes that access roads will be completely removed.

Unless the landowner states in writing that any elements are to be retained, fence parts and associated foundations, gravel pads, and access roads would be removed.

Decommissioning activities include the removal and stockpiling of aggregate materials on-site for salvage preparation. It is conservatively assumed that cement-stabilized soil and aggregate materials will be removed from the Project area and hauled up to 20 miles from the Project area. Following removal of aggregate and cement-stabilized soil, the access road areas will be graded, de-compacted with deep ripper or chisel plow (ripped to 18 inches), backfilled with native subsoil and topsoil, as needed, and graded as necessary.

3 LAND USE AND ENVIRONMENT

Hazardous materials will be disposed of in a manner consistent with federal, state, and local law. In accordance with Section 3.1.D.27.a.ix.a of the Code, soil will be tested before the facility is brought online and again once energy production has ceased but before equipment is removed. At least five samples will be taken, and they will be representative of the overall Project area; outliers in terms of soil type, drainage, or plant growth will be excluded. The samples from before and after the operation of the facility will be compared to determine what contaminants, if any, are present and to develop a remediation program if necessary.

3.1 Soils and Agricultural Land

Areas previously use for agriculture within the Project area will be restored to their preconstruction condition, aligning with landowner lease agreements. Restoration efforts will be guided by consultations with current landowners and compliance with applicable regulations at the time of decommissioning. Disturbed land will be rejuvenated to facilitate use resembling its original agricultural purpose prior to Project construction. Soil exposed during decommissioning will be stabilized in accordance with the Project's Vegetation Establishment and Management Plan, provided with the Project's Special Use Permit application under a separate cover.

3.2 Restoration and Revegetation

Excavated and backfilled Project sites will undergo grading as previously detailed. Voids or holes remaining after equipment removal, if present, will be filled. Soil compaction resulting from deconstruction activities will be rectified as needed to restore land to its preconstruction state. Damaged drain tiles, if present, will be restored to preconstruction condition. Disturbed areas will be enriched with topsoil and seeded with appropriate vegetation, in coordination with landowners within agricultural zones. Work will adhere to conditions agreed upon by RWE and as dictated by prevailing regulations at the time of decommissioning.

During decommissioning, disturbances or removal of additional native vegetation will be avoided to the greatest extent practicable. Land disturbed during the decommissioning process will be revegetated or re-seeded with native plants selected with support from Colorado Parks and Wildlife's Colorado Seed Mix Tool, or with other species that provide ecological services. Pursuant to 3.1.D.27.a.ix.c of the Code, revegetation will be completed within 1 year of the removal of equipment, with up to a 6-month extension available if needed to complete a growing season.

3.3 Surface Water Drainage and Control

The Project area, which is predominantly situated within actively drained agricultural land, features relatively flat terrain, with several ditches shielded by grassy buffers and berms. The Project's layout has been designed to avoid wetlands, waterways, and drainage ditches to the greatest extent feasible. Surface water conditions will undergo reassessment before decommissioning. RWE will secure requisite water quality permits from the Colorado Department of Public Health and Environment and the U.S. Army Corps of Engineers, if necessary, prior to Project decommissioning. Additionally, construction stormwater permits will be obtained, and BMPs for safeguarding surface water will be employed. BMPs may include use of specific construction entrances, temporary and permanent seeding, mulching (in non-agricultural areas), erosion control matting, silt fence, filter berms, and filter socks.

3.4 Major Equipment Required for Decommissioning

Decommissioning activities involve the removal of aboveground Project components and subsequent restoration, as discussed in Sections 2 and 3.2. Equipment necessary for decommissioning mirrors that required for constructing the solar facility and may include, but is not confined to, small cranes, low ground pressure (LGP) track-mounted excavators, backhoes, LGP track bulldozers, LGP off-road end-dump trucks, front-end loaders, deep rippers, water trucks, disc plows, tractors for subgrade restoration, and ancillary equipment. Over-the-road dump trucks will facilitate material transport from the site to disposal facilities.

4 DECOMMISSIONING COST ESTIMATE SUMMARY

Expenses associated with decommissioning the Project will be dependent on labor costs at the time of decommissioning. For the purposes of this report, approximate 2023–2024 average market values were used to estimate labor expenses. Fluctuation and inflation of the labor costs were not factored into the estimates.

4.1 Decommissioning Expenses

Project decommissioning will incur costs associated with disposal of components not sold for salvage, including materials that will be disposed of at a licensed facility, as required. Decommissioning costs also include backfilling, grading, and restoration of the Project area as described in Section 2. Table 2 summarizes the expense estimates for activities associated with the major components of the Project.

Table 2. Estimated Decommissioning Expenses

Activity	Unit	Quantity	Cost Per Unit	Total
Management oversite and permitting	Lump sum	1	$500,000.00	$500,000.00
Mobilization/demobilization	Lump sum	2	$500,000.00	$1,000,000.00
Solar modules: disassembly and removal	Each	489,549	$4.88	$2,388,559.92
Tracker system: disassembly and removal	Each	5,858	$663.00	$3,883,854.00
Steel pile removal	Each	68,217	$10.29	$701,952.93
Inverter station removal	Each	73	$1,700.00	$124,100.00
Transformers removal	Each	41	$2,500.00	$102,500.00
Access roads and inverter foundation removal	lump sum	1	$464,700	$464,700.00
Perimeter fence removal	Linear feet	142,503	$2.97	$423,233.91
Aboveground cable removal	Linear feet	75,000	$0.25	$18,750.00
Battery container removal	Each	153	$1,900.00	$290,700.00
Battery rack removal	Each	765	$478.00	$365,670.00
Removal of transmission poles (including cable)	Lump sum	1	$305,000.00	$305,000.00
Site restoration (1,533 acres)	Lump sum	1	$850,000.00	$850,000.00
Repair of public roads	Lump sum	1	$225,000.00	$225,000.00
Project substation removal	Each	1	$350,000.00	$350,000.00
Trucking/disposal fees	Lump sum	1	$350,000.00	$350,000.00
Total estimated decommissioning costs				**$12,344,020.76**

4.2 Decommissioning Revenues

Project revenue will be realized through the sale of the solar facility components and construction materials. Modules and other components may be sold within a secondary market or as salvage. The market value of steel and other materials fluctuates daily and has varied widely over the past 5 years. Salvage value estimates were based on an approximate 5-year-average price of steel and copper derived from sources including online recycling companies[1] and U.S. Geological Survey commodity summaries[2]. The price used to value the steel used in this report is $255 per metric ton; aluminum at $0.40 per pound; silicon at $0.40 per pound, and glass at $0.05 per pound. The main component of the tracking system and piles is assumed to be salvageable steel. Solar panels are estimated to contain approximately 75% glass, 8% aluminum, and 5% silicon. A 70% recovery rate was assumed for aluminum and all panel components

[1] https://www.scrapmonster.com/scrap-yards/prices/colorado/state/3371; https://jrsadvancedrecyclers.com/scrap-metal-prices/; https://www.scrapmetalbuyers.com/current-prices

[2] https://pubs.usgs.gov/publication/mcs2024

because of the processing required to separate the panel components. Alternative and more efficient methods of recycling solar panels are anticipated before this Project is decommissioned, given the large number of solar facilities that are currently being developed. Table 3 summarizes the potential salvage value for the solar array components and construction materials.

Table 3. Estimated Decommissioning Revenues

Item	Unit	Salvage Price Per Unit	Units Per Item	Total Salvage Price Per Item	Number of Units	Total
Panels – silicon	Average pounds per panel (item)	$0.40	1.9	$0.76	489,549	$372,057.24
Panels – aluminum	Average pounds per panel (item)	$0.40	3	$1.20	489,549	$587,350.80
Panels – glass	Average pounds per panel (item)	$0.05	27.5	$1.38	489,549	$675,577.62
Panels – other	Average pounds per panel (item)	$0.50	2.7	$1.35	489,549	$660,769.65
Tracking system, transmission poles, battery containers, and posts (mixed metals)	Tons	$255	1	$255	300	$76,500.00
Cables	Tons	$3,000	1	$3,000	100	$300,000.00
Inverters	Each	$80.00	1	$80	73	$5,840.00
Transformers	Each	$120.00	1	$120	41	$4,920.00
Substation	Lump sum	1	–	–	1	$60,000.00
O&M building	Lump sum	1	–	–	1	$5,000
Total potential revenue						**$2,748,015.31**

4.3 Decommissioning Cost Summary and Financial Assurance

A summary of the net estimated cost to decommission the Project, using the information detailed in Sections 4.1 and 4.2, is provided in Table 4. Estimates are based on 2023–2024 prices; market fluctuations and inflation were not included in the estimate.

Table 4. Net Decommissioning Summary

Item	Cost/Revenue
Decommissioning expenses	$12,344,020.76
Potential revenue – salvage value of panel components and recoverable materials	$2,748,015.31
Net decommissioning cost	$9,596,005.45