

Appendix 2-1

Solar Project Decommissioning and Reclamation Plan

Decommissioning and Reclamation Plan

Las Camas Solar Project

Prepared by:

EDPR CA Solar Park III LLC
1501 McKinney Street, Suite 1300
Houston, Texas 77010

SEPTEMBER 2022

Table of Contents

Table of Contents.....	2
1 Introduction	3
1.1 Purpose and Objectives	3
1.2 Project Description.....	3
1.3 Project Location and Site Characteristics.....	3
2 Project Components	4
2.1 Solar Generators	4
2.2 Security/Fencing	4
2.3 Interconnection.....	4
2.4 Project Substation.....	4
2.5 Generation Tie Lines	5
2.6 Site Access.....	5
2.7 O&M Building.....	5
2.8 Battery Energy Storage	5
3 Decommissioning and Recycling.....	6
3.1 Decommissioning Preparation.....	6
3.2 Photovoltaic Equipment Removal and Recycling.....	6
3.3 Internal Power Collection system	6
3.4 On-Site Substation and Switching Station	6
3.5 Energy Storage System	7
3.6 Security Fencing	7
3.7 Generation-Tie Lines	7
3.8 Operations and Maintenance Building	7
3.9 On-site Access Roads	7
4 Site Reclamation	8
5 Performance Security.....	9

1 Introduction

1.1 Purpose and Objectives

EDPR CA Solar Park III LLC (Proponent) has prepared this Decommissioning and Reclamation Plan (Plan) to ensure that infrastructure associated with the Las Camas Solar Project (Project) is removed after the Project's useful life and to ensure that the area impacted by the Project is reclaimed to conditions consistent with appropriate reference areas. This Plan has been prepared in support of an application for Conditional Use Permit to Merced County.

1.2 Project Description

The Project is a photovoltaic (PV) solar facility with associated infrastructure on approximately 1,750 acres of privately owned land. The Project would consist of 200 MWs of ground-mounted solar photovoltaic energy facilities and 100 MW of energy storage facilities. The Project would be supported with an up to 1-mile 230 kV overhead electrical transmission line(s) originating from an on-site project collector substation and terminating at the Pacific Gas & Electric (PG&E) Los Banos Substation.

1.3 Project Location and Site Characteristics

The Project site is located directly west of Interstate 5 and south of State Highway 152. The site consists of undeveloped private land, which currently consists primarily of non-native annual grassland.

2 Project Components

The combined Project facilities include the following components, which are described in greater detail in this section:

- Solar generators
- Security Fencing
- Project collector substation
- Generation tie (gen-tie) lines
- Site access roads
- Operations and maintenance (O&M) building
- Battery energy storage

2.1 Solar Generators

The Project would generate direct-current (DC) electricity through a series of solar PV modules connected to one another on ground-mounted single-axis tracking structures. Electricity would flow from the panels to solar inverters via DC collection wires. The solar array fields would be arranged in groups called “blocks” with inverter stations generally located centrally within the blocks. Direct current would be converted to alternating electrical current (AC) at the inverter stations. Once the DC electricity has been converted to AC electricity, the output from the solar inverters would be aggregated at an on-site collector substation where it is stepped up to a higher voltage and then moved along gen-tie lines to the Project’s point of interconnection (POI) at PG&E’s Los Banos Substation.

2.2 Security/Fencing

The facility will be secured with a 6 to 8-foot-high chain link fence along the perimeter.

2.3 Interconnection

The Project’s point of interconnection (POI) is the point at which the power generated by the Project would be delivered to the electrical grid. The Project would interconnect at PG&E’s Los Banos Substation at 230 kV. Salvage value of the interconnection switchyard has not been included in this Plan because the switchyard would be owned and operated by PG&E.

2.4 Project Substation

The proposed collector substation is the point at which the power generated from the Project is aggregated. The main purpose of the substation is to step up the voltage of the generated power to match the interconnection voltage through the use of a step-up transformer. In addition, the Project substation would include protective relays and circuit breakers that protect the grid from any disruption or disturbances, either external or internal to the Project. Common substation equipment includes a control building, transformers, circuit breakers, meters, and overhead switches. The Project substation would be secured with the use of a 6- or 8-foot-tall chain-link fence with triple-strand barbed wire. The internal grounds of the Project substation would be covered in crushed aggregate.

2.5 Generation Tie Lines

The Project would include 230 kV gen-tie conductor on steel monopoles that connects the collector substation to the Project's POI. The maximum length of the gen-tie would be 2 miles from the on-site collector substation to the existing PG&E Los Banos Substation. Additionally, 34.5 kV collector lines connect the various on-site project components to transmit energy to the larger transmission line system.

2.6 Site Access

Vehicular access to the project site during construction and operation would be provided via a new access point at Billy Wright Road where it abuts the eastern portion of the project site. This access point would be reached by taking Highway 152 west out of Los Banos and turning left onto Billy Wright Road, or by exiting I-5 onto Highway 152 and turning right onto Billy Wright Road. Access roads to be constructed around and between the arrays may include crushed aggregate, if necessary, to prevent damage to existing soils.

2.7 O&M Building

Employees of the Project may work out of an up to 1,200 square-foot Operations and Maintenance (O&M) building on site.

2.8 Battery Energy Storage

The Project would include a lithium-ion battery energy storage system consisting of a number of battery storage units capable of storing electricity may be installed with a capacity of up to 100 MWs. The batteries would be physically arranged in racks that would be housed in temperature-controlled facilities referred to as the battery enclosures. These enclosures would be equipped with all the necessary ancillary equipment including appropriate fire suppression systems and other electrical control units to safely operate the battery storage units.

The battery units would be AC coupled or DC coupled with the solar generators. When the battery storage is AC coupled, the storage facility is centralized at a project substation, and the solar and storage systems have independent inverters, medium voltage (MV) transformers, and MV collection circuits. When the battery storage is configured as a DC coupled system to the solar generators, the batteries are distributed throughout the solar arrays and share the solar inverter, MV transformers, and MV collection circuits. Past the Project collector substation, downstream use of the gen-tie and POI facilities would be shared by both the solar and battery storage systems.

3 Decommissioning and Recycling

Decommissioning efforts would focus on the removal of all Project components, including racking/mounting systems, panels, inverters, structural foundations, and other associated materials. Most materials would be recycled including steel, glass, concrete, and wood. Scrap equipment or metals that do not contain free-flowing oil may be sent for salvage.

Containers used to store hazardous materials would be inspected prior to removal for any signs of failure or leakage. Transportation of removed hazardous materials would comply with applicable regulations, including those set by the U.S. Department of Transportation, and pursuant to a Hazardous Materials Business Plan to be developed prior to construction.

3.1 Decommissioning Preparation

The initial phase of the decommissioning process would include site inspection and preparation for demolition. It is anticipated that equipment removal, demolition, re-grading, and re-seeding will require use of temporary storage areas, temporary offices, laydown yards for equipment, and temporary employee parking. Previously disturbed areas would be used where applicable.

Demolition debris would be placed in temporary on-site storage areas pending final transportation and disposal/recycling according to the procedures described below. Additional storage areas, parking facilities, and temporary offices would be selected by the proponent and its demolition contractors to avoid any new disturbance or grading to the extent practicable. If new disturbances are unavoidable, all applicable best management practices included within this and all project plans and permits would apply. Haul roads used for transporting dismantled materials would follow existing Project roads.

3.2 Photovoltaic Equipment Removal and Recycling

PV solar panels are typically made of recyclable materials, including silicon, glass, and metal frames. Glass and steel would be processed for transportation and delivery to an off-site recycling center.

3.3 Internal Power Collection system

During decommissioning, above-ground conductors would be removed from the site and recycled. Below-ground conductors would be cut off and de-electrified and remain in place at a minimum of 12 inches below grade in order to minimize ground disturbance during decommissioning. All steel conduit and conductor cabling that is removed will be recycled.

3.4 On-Site Substation and Switching Station

The electronic components of the substation equipment would be disconnected and made safe for removal. The building would be dismantled and recycled. Concrete would be broken up to a minimum of 12 inches below grade and removed from the site to an appropriately licensed disposal facility. All debris, including aggregate rock, would be removed from the substation and properly disposed of, or recycled if practicable.

Transformers using insulating oils would be removed from the site and recycled or disposed of at an appropriately licensed disposal facility. Site personnel involved in handling these materials would be trained appropriately, and transportation would comply with applicable regulations.

3.5 Energy Storage System

The energy storage system would be dismantled and removed. Batteries, along with the racks, wiring, and other ancillary equipment, would either be repurposed/repowered or dismantled and recycled according to all applicable local, state, and federal laws and regulations. All decommissioning and recycling activities would be required to be carried out by a licensed handler/hauler under strict compliance with all applicable regulations.

3.6 Security Fencing

The perimeter chain link fence will be removed using small skid steers, a mini excavator, a small dump trailer, and full-size pickup trucks. The fencing and gates would be removed, and all materials would be recycled to the extent feasible.

3.7 Generation-Tie Lines

At the time of full Project decommissioning, if the transmission line would not be further used by a public or private utility or power generator, then the lines would be decommissioned. Dismantling would proceed according to four general stages. The first stage would consist of dismantling and demolishing above-ground structures. The second stage would consist of removing concrete foundations and other components a minimum of 12 inches below final grade. The third stage would consist of excavating and removing soils and broken concrete from the site. The final stage would consist of surface contouring to return the disturbed areas to match surrounding conditions.

3.8 Operations and Maintenance Building

If it is determined that the O&M building will no longer be useful for future land uses on the site, it will be decommissioned. The O&M building would be dismantled and recycled. The concrete foundation would be removed to a minimum of 12 inches below grade, and parking area would be broken up and removed from the site to an appropriately licensed disposal facility. All equipment would be removed and recycled to the extent practical. The area will be revegetated as described in Section 4.0.

3.9 On-site Access Roads

On-site roads would remain in place during decommissioning to facilitate infrastructure removal. After all other infrastructure is removed, Project roads would be recontoured to match surrounding conditions. Unless the landowner elects to retain the improved roads for access throughout that landowner's property after decommissioning, the ground surface would be restored and revegetated, as described in Section 4, Site Reclamation.

4 Site Reclamation

Revegetation of the site would take place after removal of all infrastructure and debris. These efforts would be conducted in consultation with Merced County to determine appropriate seed mixes, application rates, and the potential use of any germination-enhancing fertilizers.

Once all Project components are removed, disturbed areas would be recontoured to match surrounding conditions in preparation for seeding. The site's topography is relatively flat, allowing for minimal grading during initial construction, targeting only those areas where required. It is therefore anticipated that grading/recontouring efforts needed to achieve successful decommissioning would be minimal.

Seeding would consist of some scarification of Project-caused compaction areas to allow for proper seed penetration. Tilling, disking, or other methods for decompaction would be done in consultation with a landscape architect or similarly qualified individual.

5 Performance Security

It is expected that the Proponent would be responsible for ensuring that performance security is available to cover all costs associated with decommissioning and reclamation. In the following section of this Plan, the security has been determined by estimating costs of decommissioning but factoring in any residual salvage value of decommissioned material. The Proponent has prepared a decommissioning budget for the Project in Table 1 below to determine the required security amount.

The estimated budget represents a probable cost, in present value, for the decommissioning based on the assumption that the solar modules, module support structures/racking, electrical system, interconnection facilities and other project components will be disassembled and recycled or disposed of following completion of use of the solar electric power system. The budget is built on the assumption that the cost of decommissioning will be partially offset by the scrap value of the used Project components. The decommissioning cost and salvage value for the 100-MW battery energy storage system has not been included at this time. Instead, the Proponent would work with Merced County to adjust performance security once the energy storage design is done.

Methodology

The cost estimates rely on studies contracted by the Proponent's parent company, EDP Renewables North America LLC (EDPR), for a 200 MW solar project in Fresno County (Appendix A). The study was conducted in September 2021. Wage rates used in the estimate were based on hourly wages and were determined using RS Means Construction Cost Estimating Software and were determined for each discipline in Fresno County. The costs outlined in the study are referred to as the "Baseline" costs in Table 1 below.

In order to adapt the baseline cost estimates to the unique characteristics of the Las Camas Solar Project, adjustments were made to the baseline cost estimates. First, to account for potential differences in costs between Fresno and Merced Counties, all costs were increased using a 5% cost-of-living adjustment.¹ Second, in order to reflect present-day valuation, costs have been adjusted for inflation relative to a 12-month 8.5% increase in the consumer price index². In order to present a conservative estimate, no adjustment was made to the estimated baseline salvage value.

Decommissioning Budget

The decommissioning estimation process was divided into 7 general work categories. Quantities and unit prices for these individual work items are presented and discussed in detail in Appendix A, and Table 1 below presents estimates adjusted for cost of living and inflation. As shown below, the Proponent would be responsible for ensuring performance security of **\$4,843,858**.

Table 1. Las Camas Solar Decommissioning Cost Estimate and Initial Performance Security

<u>Cost Category</u>	<u>A. Baseline</u>	<u>B. Cost-of-</u>	<u>C. Inflation</u>	<u>Total [A] x [B]</u>
		<u>Living</u>		
		<u>Adjustment</u>	<u>Adjustment</u>	<u>x [C]</u>
Mobilization and Management	\$ 2,753,667	1.05	1.085	\$ 3,137,115
Module and Rack Disassembly	\$ 2,232,200	1.05	1.085	\$ 2,543,034

¹ https://www.bestplaces.net/cost_of_living/county/california/merced & https://www.bestplaces.net/cost_of_living/county/california/fresno

² <https://www.bls.gov/cpi/>

Las Camas Solar Project
Decommissioning and Reclamation Plan

Shallow Pier Foundation Removal	\$	933,630	1.05	1.085	\$	1,063,638
Electrical Demolition	\$	908,984	1.05	1.085	\$	1,035,560
Civil Site Reclamation	\$	1,230,809	1.05	1.085	\$	1,402,199
Material Transport and Waste Disposal	\$	1,043,645	1.05	1.085	\$	1,188,973
Profit and Contingencies	\$	2,275,800	1.05	1.085	\$	2,592,705
Total Cost of Disassembly and Removal					\$	12,963,224
Scrap Value	\$	8,119,366	N/A		\$	8,119,366
Total Salvage Value of Materials					\$	8,119,366
Initial Performance Security					\$	4,843,858

Appendix A – Baseline Solar Decommissioning Cost Estimate

Helix Environmental Planning, Inc.
11 Natoma Street Suite 155
Folsom, CA 95630
Attn: Ms. Catherine Silvester

Date of Submission: September 29, 2021

Subject: **Scarlet Solar Center-Phase 1**

Blue Oak Energy has prepared a decommissioning budget for the 200 mW AC Solar Center located in Fresno County, CA..

The estimated budget represents a probable cost, in present value, for the decommissioning based on the assumption that the solar modules, module support structures/racking, electrical system, interconnection facilities and other project components will be disassembled and recycled or disposed of following completion of use of the solar electric power system. The budget is built on the assumption that the cost of decommissioning will be fully or partially offset by the scrap value of the used project components, however the dollar values are presented separately. **The report is applicable for a two year period from date of submission.**

Information Sources for this Review

This review is based on the site constraints plans and estimated quantity information based on similar projects, and through discussions with contractors familiar with this type of construction. Wage rates used in these estimates are based on hourly wages and are determined for each discipline by the city and state nearest and most indicative of the site's location at the time of Asset Retirement Obligation (ARO) report implementation. Typical disciplines utilized for decommissioning are a principal electrician, equipment operator and general laborer.

Each task lists both the total worker hours needed to complete the project as well as the breakdown for each discipline. The total cost of that task is a function of the worker's class and time, and scales with the quantity or magnitude of the task. Project specific equipment is calculated by determining the amount of teams necessary to complete each task as a function of project duration. Lifetime of projects are assumed by the Owner to reach 40 years.

Wage Determination

Hourly wages are determined for each discipline by the County, State, and General Decision Number at the time of Asset Retirement Obligation (ARO) report implementation. Wage rates are assumed as Open Shop.

- Wage Source: RS Means
- County, State: Fresno Co., CA
- Table: "Installing Contractor Overhead & Profit"
- Tabulation Date: 9/28/2021

Worker Title	Class (If applicable)	Fully Burdened Rate (\$/hr.)	
Electrician	Principal	\$	83.24
General Laborer	Class 1	\$	51.86
Equipment Operator	Class 1	\$	69.82

Decommissioning Scope

The decommissioning and restoration process in the plan generally consists of the following steps:

- Disassembly and removal of above ground structures
- Removal of below-ground structures
- Restoration of project site

Above-ground structures include but are not limited to: solar modules, module support structures, load break disconnect switches, power conversion stations, cable tray, and all structures to support them. Below-ground structures are limited to steel piers, fence posts in concrete piers, conduit, pull boxes and electrical conductors. For the purposes of this estimate, it is practical to assume that underground conduit under permanent concrete and asphalt surfaces will not be removed.

Following removal of all equipment and structures, the disturbed areas will be re-graded to be consistent with surrounding areas and reseeded to promote vegetation. The cost for disposal for any materials that are not scrapped is considered incidental, unless otherwise noted.

Decommissioning Budget

The decommissioning process has been divided into 7 general work items. Quantities and unit prices for these individual work items are presented and discussed in detail in the following paragraphs.

1. Mobilization & Management
2. Module and Rack Disassembly
3. Shallow Pile Foundation Removal
4. Electrical Demolition
5. Civil Site Reclamation
6. Materials Transportation and Disposal
7. Profit & Contingency

1. Mobilization & Management

- 1.1 Mobilization. The decommissioning and removal process will require an estimated 52 weeks.

A. Mobilization and demobilization of trash dumpsters, storage containers, pallets, portable toilets, etc. Additional information regarding mobilization can be viewed in Appendix A, Table A1.

\$ 571,820

B. Mobilization, rental and demobilization of construction equipment, tools and consumables. Additional information regarding mobilization of miscellaneous equipment can be viewed in Appendix A, Table A2 and Table A3. Cost is estimated to be:

\$ 1,817,847
\$ 2,389,667

Subtotal:

1.2 Project Management. Planning and oversight is a function of system type and size estimated at: \$ 364,000

Total estimate for **Mobilization & Management**: \$ 2,753,667

2. Module and Rack Disassembly

2.1 Removal of Solar Array:

A. Removal of the individual solar modules will require laborers, off-road forklift operators and electricians. Modules will be palletized for shipping.

Estimated number of PV modules:		523,624 modules [A]		
Worker Title	Workers Per Team [B]	(hr.) /person/mod. [C]	[A] x [B] x [C] x Labor Rate	
Electrician: De-energizes circuits, disconnects module, 2nd electrician certifies safe for laborer	2	0.0025	\$	217,932
General Laborer: Dismount modules, palletize and band	2	0.005	\$	271,551
Equipment Operator: Off road forklift, salvage truck	2	0.0125	\$	913,986
Subtotal:			\$	1,403,469

B. Demolition of the racking structure will require laborers with pneumatic impact tools or saws for the disassembly of racking members. All structural members will be collected by an end loader for transfer to salvage truck.

Estimated number of Trackers		6,128 Trackers [A]		
Worker Title	Workers Per Team [B]	(hr.) /person/equip. [C]	[A] x [B] x [C] x Labor Rate	
General Laborer: Demolition team	6	0.3	\$	572,037
Equipment Operator: End Loader, salvage truck	4	0.15	\$	256,714
Subtotal:			\$	828,751

Total estimate for **Module and Rack Disassembly**: \$ 2,232,220

3. Shallow Pier Foundation Removal

3.1 Removal of Shallow Piers-PV Array and External Equipment

Removal of piers with vibratory extractor. Each pier will be pulled and directly loaded onto salvage truck following extractor.

Estimated number of Piers		73,075 Piers [A]		
Worker Title	Workers Per Team [B]	(hr.) /person/pier [C]	[A] x [B] x [C] x Labor Rate	
General Laborer: Demolition team	3	0.035	\$	397,913
Equipment Operator: Vibratory Pier Extractor, Salvage Truck	3	0.035	\$	535,717
Subtotal:			\$	933,630

Total estimate for **Shallow Piers Foundation Removal**: \$ 933,630

4. Electrical Demolition

The majority of the electrical system is composed of DC combiner boxes, power aggregation wiring, and Power Conversion Stations (DC recombiner/inverter/transformer modular units). All conductors are assumed to be removed and aggregated for recycling. All subterranean conduit, Power Conversion Stations and other electrical equipment will be removed for off-site recycling or disposal.

4.1 Excavation and removal of underground conductors and communications cables

The estimated cost for excavation and removal of underground direct-buried conductors for scrap and/or disposal is based on labor costs for excavation & earthwork, conduit removal, and transportation of materials in two person teams.

Estimated length of trench:		41,500 ft. [A]		
Worker Title	Workers Per Team [B]	(hr.) /person/100 ft. [C]	[A] x [B] x [C] x Labor Rate	
General Laborer: Wire pull operator	2	0.15	\$	6,457
Equipment Operator: Off road forklift, excavator	1	2.5	\$	72,438
Subtotal:			\$	78,895

4.2 Removal of above ground conductors and messenger support cables

The estimated cost for removal of above ground conductors and grounding cable for scrap and/or disposal is based on labor costs for conductor scrapping and transportation of materials. Pull rate is assumed to be an average of 100 ft./minute.

Estimated length: 1,832,684 ft. [A]

Worker Title	Workers Per Team [B]	(hr.) /person/100 ft. [C]	[A] x [B] x [C] x Labor Rate
General Laborer: Remove conductors from tracker structures	2	0.075	\$ 142,564
Equipment Operator: Forklift driver, End loader	3	0.045	\$ 172,743
Subtotal:			\$ 315,308

4.3 Removal of Power Conversion Stations

Removal work includes cutting and removal of cable and conduit, crane removal for skid as a package to salvage truck. Salvager is assumed to pay transport costs. Remove precast PCS support piers.

Worker Title	Workers Per Team [B]	(hr.) /person/trans. [C]	60 Skids [A] [A] x [B] x [C] x Labor Rate
Electrician: De-energizes circuits, 2nd electrician certifies safe	2	2	\$ 19,978
General Laborer: Cutting conduit/wire, harnessing, removing hold down br	1	9	\$ 28,004
Equipment Operator: 25 Ton Crane	4	4	\$ 67,027
Subtotal:			\$ 115,009

4.4 Removal of Load Break Disconnect Switches (LBD)

Removal of Load Break Disconnect Switches from site with any support structures, cable, and conduit to a depth of three feet below grade.

Worker Title	Workers Per Team [B]	(hr.) /person/inv. [C]	1,025 LCD [A] [A] x [B] x [C] x Labor Rate
Electrician: De-energizes circuits, removes terminations	1	0.25	\$ 21,330
General Laborer: Cutting conduit/wire, harnessing	1	0.25	\$ 13,289
Equipment Operator: End loader, salvage truck	1	0.125	\$ 8,946
Subtotal:			\$ 43,565

4.5 Removal of Additional Electrical Equipment

Removal of sensors, weather stations and other auxiliary electrical equipment. Cost estimate accounts for equipment and labor costs for removal to a depth of three feet below grade.

Worker Title	Workers Per Team [B]	(hr.) /person/equip. [C]	10 installations [A] [A] x [B] x [C] x Labor Rate
Electrician: De-energizes circuits, removes terminations	2	2	\$ 3,330
General Laborer: Conduit/wire, harnessing	1	0.5	\$ 259
Equipment Operator: End loader, salvage truck	1	0.5	\$ 349
Subtotal:			\$ 3,938

4.6 Removal MV Direct Burial Cabling

Removal and collection of 34.5kV underground collection cable.

Worker Title	Workers Per Team [B]	(hr.) /person/equip. [C]	277,425 ft. [A] [A] x [B] x [C] x Labor Rate
General Laborer: Decoupling, loading on forklift	4	0.15	\$ 86,324
Equipment Operator: Forklift driver, End-loader, Crane Operator	2	0.15	\$ 58,109
HV Electrical Lineman	6	0.15	\$ 207,836
Subtotal:			\$ 352,269

4.7 Removal of Substation

Removal of all substation equipment including transformers, switches, structures, overhead lines, equipment pads and grounding grid.

It has been determined through research and communications with scrap vendors, equipment vendors, substation contractors and substation engineers that the cost to demolish the installed substation and to return the site to original condition should be less than the future day value of the scrapped components. Other decommissioning reports for similar substation installations have obtained the same conclusions. The large variation of components in the substation in current day would have reuse value but may only be suitable for scrap value at the end of the substation life. Using any predicted scrap value that exceeds the substation decommissioning cost for overall credit to the decommissioning report would be speculative. For these reasons we maintain that the net sum effect of the substation decommissioning be a zero value for the purposes of this report.

Total estimate for **Electrical System Removal:** \$ **908,984**

5. Civil Site Reclamation

All developed areas will be restored to pre-construction conditions or as stated in decommissioning contract.

5.1 Power Conversion Station Skid Demolition

The Power Conversion Stations each contain a DC recombiner, central inverter and MV step-up transformer mounted on a modular skid. The removal of this equipment has been accounted for in the Electrical Demolition section and will not be counted here. The skid is supported by precast piers, the removal of these piers has been accounted for in Section 3.3.1.

5.2 Fence Removal

The decommissioning plan includes removing chain link fence, slatted fence and sand fence around the project perimeter including gates and fence posts.

Approximate length of fence:			82,875 ft. [A]	
Worker Title	Workers Per Team [B]	(hr.)/person/ft. [C]	[A] x [B] x [C] x Labor Rate	
General Laborer: Fence detachment, aggregating	1	0.03	\$	107,447
Equipment Operator: Backhoe-pull and load fence posts, salvage truck	1	0.02	\$	115,727
Subtotal:			\$	223,174

5.3 Trench Remediation

The decommissioning plan includes remediation of trench where underground conductors occur.

Approximate length of trench:			41,500 ft. [A]	
Worker Title	Workers Per Team [B]	(hr.)/person/ft. [C]	[A] x [B] x [C] x Labor Rate	
General Laborer: Excavation	1	0.01	\$	21,522
Subtotal:			\$	21,522

5.4 Aggregate Base Rock Removal

The decommissioning plan includes removing gravel/aggregate base rock from roads in order to restore the site to pre-project conditions. The cost for removal is estimated based on a gravel depth of 8".

Approximate volume of gravel on site			60,848 cubic yards [A]	
Worker Title	Workers Per Team [B]	(hr.)/person/cu yd. [C]	[A] x [B] x [C] x Labor Rate	
Equipment Operator: Grader, end loader, dump truck	3	0.05	\$	637,266
Subtotal:			\$	637,266

5.5 Re-grading of Site

The decommissioning plan includes excavation and removal of underground materials and foundations. After removal, all excavated areas will need to be filled, compacted, and re-graded to return the site to pre-project conditions. Re-grading accounts for the time needed to perform the necessary earthwork required to return the site to preconstruction conditions.

Estimated acres of partial or complete grading required:			1,760 acres [A]	
Worker Title	Workers Per Team [B]	(hr.)/person/acre [C]	[A] x [B] x [C] x Labor Rate	
Equipment Operator: Maintainer-Grader	1	1.5	\$	184,325
Subtotal:			\$	184,325

5.6 Site Rehabilitation

The estimated cost of this restoration work accounts for all costs of mowing, disking, and hydraulic seeding of the project site. These areas within the site consist of improved roadways, PCS sites, electrical trenches, and other high traffic areas. The labor costs associated with this task are lumped to include equipment as well as labor rates from an external party. The cost allowance assumes 9% of the total site will require seeding to the full extent stipulated in the Draft Soil Reclamation Plan. The remaining property is assumed to be immediately repurposed for agriculture.

Total area requiring Site Rehabilitation:			158 acres [A]	
Worker Title	Workers Per Team [B]	(hr.)/person/acre or \$ [C]	[A] x [B] x [C] x Labor Rate	
Equipment Operator: Disk, chiselplow and roller operations	3	1	\$	33,178
Equipment Operator: Fertilizer application, seeding, irrigation	3	1.5	\$	49,768
Estimated material cost for seeding (gypsum, nitrogen, approved seed)-per	NA	\$ 515	\$	81,576
Subtotal:			\$	164,522

Per Acre Site Rehabilitation Cost: \$ 1,039

Total estimate for Civil Site Reclamation:

\$ 1,230,809

6. Materials Transportation and Waste Disposal

6.1 Disposal of Waste and Non-Salvageable Materials

The decommissioning plan includes excavation removal of all cement, gravel, waste materials, and other miscellaneous non-salvageable items from the project site. Mobilization accounts for a portion of disposal via dumpster rental, which includes up to 4 tons of disposal per dumpster per week. The weekly fee is \$900 per dumpster, including delivery and pickup. Cost of disposal for the remaining equipment waste was estimated at \$79/ton, based on \$0.6/ton/mile for a 56-mile round-trip, and \$45/ton in tipping fees. Cost of disposal for the cement, concrete, and/or gravel was estimated at \$10/ton.

Estimated weight of unsalvageable equipment:	27 tons
Estimated weight of miscellaneous waste:	10 tons

Estimated weight of cement, concrete, and/or gravel:	61,539 tons
Tons accounted for in mobilization with rental of two (2) dumpsters:	416 tons
Total Net:	61,160 tons
Subtotal:	\$ 585,450

6.2 Transportation of Salvageable Materials

The decommissioning plan includes removal of all equipment and structures from the project site that may have a salvage value at the time of decommissioning, including: Electrical equipment enclosures, racking, fencing, and other miscellaneous items. There is an assumed cost associated with the transportation of these items to the salvage yard, which is based on \$0.6/ton/mile rate for a 56 mile round-trip.

Estimated weight of salvageable steel:	13,382 tons
Estimated weight of salvageable aluminum:	231 tons
Estimated weight of salvageable copper:	24 tons
Total:	13,637 tons
Subtotal:	\$ 458,196

6.3 Transportation of PV Modules

The decommissioning plan includes removal, palletizing and placing pallets in a standard 53' trailer to be provided by a module salvage company. All transport costs for removal of modules are assumed to be paid by the module salvage company. No payment for any inherent value the modules may have is anticipated.

Total estimate for Materials Transportation and Waste Disposal: \$ 1,043,645

7. Profit & Contingencies

7.1	<u>Raw Disassembly, Transportation and Disposal Cost</u>	\$ 9,102,955	
7.2	<u>Firm Profit.</u> We assume a 10% profit margin for the company	\$ 910,300	
7.3	<u>Contingency.</u> 10% of the decommissioning scope cost is recommended:	\$ 910,300	
7.4	<u>Permits & Inspection.</u> 3% of the decommissioning scope cost is recommended:	\$ 273,100	
7.5	<u>Liability & Insurance.</u> 2% of the decommissioning scope cost is recommended:	\$ 182,100	
Total estimate for Profit & Contingencies:		\$ 2,275,800	

Disassembly & Removal Summary

The total estimated disassembly and removal costs from summing the items in sections 1-7 above:

\$ 11,378,755

8. Scrap Value-for materials and equipment during the 2 year period applicable to this estimate.

The estimated scrap value is based on the following material estimates:

8.1 Estimated value of scrap metal and equipment excluding conductors

Scrap metal weights account for steel piers, tracker structures, fence posts and fabric, and other salvageable equipment from the photovoltaic site.

Estimated salvage value of Power Conversion Station skid units (60 Units @ \$19,000)	\$ 1,500,000.00
Estimated weight of aluminum scrap metal:	274,903 lbs.
Estimated weight of steel scrap metal:	26,763,599 lbs.
Estimated weight of copper scrap:	500.00 lbs.
Current average price for aluminum scrap:	\$ 0.35 /lb.
Current average price for steel scrap:	\$ 0.21 /lb.
Current average price for copper scrap:	\$ 3.27 /lb.
Subtotal:	\$ 7,218,207

8.2 Estimated scrap value of conductors

The conductor system is direct burial, or surface mounted on tracker structures on site. Quantities of underground wire and wire sizes and lengths were based on electrical drawings forwarded, and were used as a basis for estimated scrapable metal amounts. Underground wiring consists of aluminum and copper conductors with bare copper grounds. It is assumed that the fiber optic cable is not salvageable and will be disposed of.

Circuit Location	Total Linear Feet	Total Weight (lb.'s)	\$/lb.	Total (\$)
#10 AWG CU PV WIRE	1,191,696	38,134	\$3.27	\$ 124,699
#8 AWG CU PV WIRE	2,780,624	141,812	\$3.27	\$ 463,725
#4/0 AWG CU GND	24,000	15,672	\$3.27	\$ 51,247
LVDC 1/C 750KCML AL	780,000	548,340	\$0.35	\$ 191,919
MVAC/LVDC 1/C #1/0 AWG AL	18,630	1,844	\$0.35	\$ 646
MVAC 1/C 4/0KCML AL	49,242	9,750	\$0.35	\$ 3,412

MVAC 1/C 500KCMIL AL	56,412	26,457	\$0.35	\$	9,260
MVAC 1/C 750KCMIL AL	20,085	14,120	\$0.35	\$	4,942
MVAC 1/C 1000KCMIL AL	46,578	43,690	\$0.35	\$	15,292
MVAC 1/C 1250KCMIL AL	86,478	102,909	\$0.35	\$	36,018
Subtotal:				\$	901,160

Scrap Value Summary

The total estimate of scrap value from summing the items above: **\$ 8,119,366**

Decommissioning Summary

The total estimate of disassembly and removal costs is: **\$ 11,378,755**

The total estimate of scrap value for the project is: **\$ 8,119,366**

Net Cost **\$ 3,259,389**

Submitted by,

Kyle R. Brooker

Project Engineer

Blue Oak Energy, LLC

3947 Lennane Dr. Suite 130

Sacramento, CA 95834

APPENDIX
Appendix A: Additional cost breakdown of compounded price structures.
Mobilization Costs:
Table A1: Office and Worker Provisions

Equipment	Weekly Rate	Delivery/ Setup and Dismantle	QTY	Weeks	Extended
Single Wide Office Trailer	\$ 73	\$ 562	1	52	\$4,897
Communications	\$ 250	\$ -	1	52	\$13,000
Furniture, Copier/scanner	\$ 250	\$ -	1	52	\$3,547
Conex-Tool Storage	\$ -	\$ 200	4	52	\$1,600
Small Generator/Utility Connection Allowance	\$ 147	\$ -	4	52	\$30,524
Jobsite portable toilets	\$ 69	\$ 40	15	52	\$53,666
Dumpsters	\$ 900	\$ -	6	30	\$162,000
Drinking Water	\$ 25	\$ -	6	52	\$7,800
Storage container, 40'	\$ 147	\$ 400	6	52	\$46,586
Small Tool Allowance	\$ 15	\$ -	30	52	\$23,400
Worker PPE Allowance	\$ 10	\$ -	30	52	\$15,600
Worker Rest and Break Shelter/Tables/Seating	\$ 200	\$ -	8	52	\$83,200
Signage	\$ 500	\$ -	1	52	\$26,000
SWPPP Install and Maintain	\$ 5,000	\$ -	1	20	\$100,000
Mobilization Total					\$571,820

Table A2: Cost Summary-Specific Equipment

Equipment	Monthly Rate	Delivery	QTY	Months	Extended
Hydraulic Excavator, diesel, 2 CY capacity	\$ 2,384	\$ 250	5	3.25	\$39,987
Carry Deck Crane 25 Ton	\$ 4,316	\$ 250	2	4	\$35,031
Skid steer, wheeled, 1 CY 78 HP, diesel	\$ 4,390	\$ 250	5	13	\$286,599
105hp Crawler Dozer	\$ 5,346	\$ 400	2	3.25	\$35,552
Offroad Extendable Forklift-6600 lbs.	\$ 2,085	\$ 250	10	6.5	\$138,001
Grader, self-propelled, 40,000 lb	\$ 3,924	\$ 400	2	3.25	\$26,306
UTV 4WD DOES; 4 SEAT ROPS	\$ 900	\$ 100	10	13	\$118,000
Pickup Truck-3/4 Ton	\$ 1,472	\$ 100	3	13	\$57,689
Backhoe-loader 80 HP 1-1/4 CY Capacity	\$ 1,030	\$ 250	6	6.5	\$41,672
Dump Truck 3 Axel	\$ 3,213	\$ 250	4	13	\$168,065
Water Truck-Dust Control-6000 GALLON	\$ 7,456	\$ 250	3	8	\$179,684
Vibratory Pile Extractor	\$ 4,500	\$ 250	6	3.25	\$89,250
Additional Equipment Total					\$1,215,835

Table A3: Specific Materials and Consumables

Materials and Consumables	Unit Cost	QTY	Working Days	Extended
Gasoline-per gallon delivered-Allow 100 gallons per day	\$ 4.29	26000	260	\$111,540
Diesel Fuel-per gallon delivered Allow 200 gallons Per day (less State and Federal taxes)	\$ 4.01	52000	260	\$208,520
Pallets and Banding Material 26 Modules Per Pal.	\$ 14.00	20,139		\$281,951
Material and Consumables Total:				\$602,011

Attachment A

Scarlet Solar Center-Phase 1

Plant Decommissioning Cost Summary

1. Mobilization & Management	\$	2,753,667
2. Module and Rack Disassembly	\$	2,232,220
3. Shallow Pier Foundation Removal	\$	933,630
4. Electrical Demolition	\$	908,984
5. Civil Site Reclamation	\$	1,230,809
6. Materials Transportation and Waste Disposal	\$	1,043,645
7. Profit & Contingencies	\$	2,275,800
Total Decommissioning Cost:	\$	11,378,755
8. Scrap Values:	\$	8,119,366
Decommissioning Cost Summary		
Estimate of Total Cost to Complete Decommissioning Activities:		
Sum of Sections 1-8	\$	3,259,389