Appendix F

Decommissioning Plan

Hayward Solar LLC
Docket No. IP-7053/GS-21-113
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Hayward Solar Project

Freeborn County, Minnesota

Decommissioning Plan

Prepared for:

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1.0 Decommissioning Plan

1.1 Project Description

The Hayward Solar Project is a proposed nominal 150 megawatt alternating current (150 MW-ac) solar electric generating facility using ground-mounted photo voltaic panels (Project), located on approximately 1958 acres of land in Freeborn County, Minnesota (Project Area). The owner of the Project is Hayward Solar LLC (Owner) who will also be the operator once it is constructed. The facilities will be located within in a fenced area and associated developed areas of approximately 1272 acres (Preliminary Development Area). Commercial Operations for the Hayward Solar Project are scheduled to begin in 2023.

On behalf of the Owner, Westwood Professional Services, Inc. (Westwood) prepared this Decommissioning Plan (Plan) for the Project. The following provisions are intended to ensure that Project facilities are properly removed after their useful life. The plan includes provisions for removal of all structures, foundations, underground cables (buried shallower than the leases and Site Permit allow to remain in place), unused transformers and foundations; restoration of soil and vegetation; and a plan ensuring financial resources will be available to fully decommission the site according to the conditions of the Site Permit that will be issued by the Minnesota Public Utilities Commission (PUC or Commission) for the Project. Underground cables will be removed to a minimum depth of four feet or as required by the Site Permit and deeper buried cables may be abandoned in place. The selected decommissioning contractors (Contractors) will comply with requirements of all permits during the decommissioning process, and disposal of structures and foundations will comply with the provisions of the Site Permit and Freeborn County Solid Waste Ordinance, Chapter 32.

1.1.1 Use of Generation Output/Power Purchase Agreement (PPA)

A Power Purchase Agreement (PPA) will be signed by Hayward Solar LLC once permitted by the Commission to sell the generation output. It is anticipated that the generation output will be sold to power utility companies within Minnesota. Additional detail will be provided when available.

1.2 Decommissioning Objective

Solar panels are expected to have a useful commercial lifespan of around 35 years; the term of the solar leases for the Project is 30 years (with a possible extension of 20 years via four 5-year extensions). The system must be decommissioned if: a) it reaches the end of system's serviceable life; or b) the system becomes a discontinued use. The Site Permit will be for a term of 30 years, upon which the Project operation may be extended (upon Commission review and approval) or the Project ceases to operate. The initial anticipated date for decommissioning the Hayward Solar Project is in the year 2053.The Owner will be responsible for removal of all above ground equipment and underground equipment, with the exception of designated below-grade foundations that may be left in place to minimize erosion and disruption to vegetation, within the Project Area. Underground cables buried deeper than three feet, or four feet depending on the lease requirements, may be left in place to minimize disturbances. The Owner will restore and reclaim the site to substantially similar pre-construction topography and topsoil quality to the extent practical.

Decommissioning includes removing the solar panels, solar panel racking, steel foundation posts and beams, inverters, transformers, overhead and underground cables (shallower than the depth specified in the lease), equipment pads and foundations, equipment cabinets, and ancillary equipment. The civil facilities, approximately 8 miles of access road, security fence/gates, and drainage structures and sedimentation basins are included in the scope. Standard decommissioning practices would be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements. The Owner may leave standing any Project building upon the request and permission of a given landowner.

After all equipment is removed, any holes or voids created by poles, concrete pads and other equipment will be restored to the surrounding grade and tilled to farmable condition. In addition, the site will be revegetated with a previously approved seed mix to minimize erosion and reduce impact to surrounding vegetation. All access roads and other areas compacted by equipment will be de-compacted to a depth of 18 inches from finished grade prior to fine grading and tilling or seeding. This may include seeding as farmland or re-development of the land for other beneficial uses, based on consultation with the landowner.

1.3 List of Decommissioning Activities

1.3.1 Timeline

The costs used in this estimate assume a 40 week decommissioning schedule.

1.3.2 Notice to Landowners, Local Governments, and the Commission

Hayward Solar LLC will notify all appropriate Landowners, Local Governing Bodies, and the Commission when decommissioning activities are to begin. Hayward Solar LLC will notify all appropriate landowners, local governing bodies, and the Commission when restoration activities are completed.

1.3.3 Decommissioning Tasks

The removal and disposal details of the Project site components are described below.

Modules: When a resale market for used solar modules exists, as it is expected to while the modules are under manufacture warranty and generating power, 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 may be shipped to the manufacturer or a third party for recycling or disposal, as some manufacturers provide options for disposal and additional manufacturers may offer this option in the future.

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.

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. 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.

Overhead and Underground Cables and Lines: All underground cables and conduits shallower than the depth specified in the leases will be removed. 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 to a density of approximately 90 percent of Standard Proctor density. Topsoil will be redistributed across the disturbed area. Overhead lines will be removed from the Project and taken to a recycling facility.

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.

Equipment Foundation and Ancillary Foundations: The ancillary foundations for the Project are pile foundations for both equipment skids and weather stations. As with the solar array steel foundation posts, the foundation piles will be pulled out completely. Duct banks will be removed to a depth sufficient so farming will not be impeded. All unexcavated areas compacted by equipment used in decommissioning will

be de-compacted in a manner to adequately restore the topsoil and sub-grade material to a density of approximately 90 percent of Standard Proctor density. 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 the Site Permit, applicable regulations, and industry standards.

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-construction conditions to extent feasible.

Access Roads: Facility access roads will be used for decommissioning purposes, after which the roads will be removed using the following process: 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 assumed to be constructed with eight inches of 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 to a depth of approximately 18 inches using a chisel plow or other appropriate subsoiling equipment. All large rocks 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.

1.3.4 Restoration/Reclamation of Site

The Owner will restore and reclaim the site to approximately the pre-construction condition consistent with the Project site lease agreements, Site Permit, AIMP, and VMP, as applicable. The Owner assumes that most of the site will be returned to agricultural use after decommissioning, and will implement appropriate measures to facilitate such uses, such as tilling to an agriculture ready condition. If no specific use is identified, the Owner will revegetate the site with a seed mix meeting the requirements of the landowner.

In accordance with Site Permit requirements the Project will have been maintained with perennial native vegetation which is expected to survive the decommissioning activities, so the effort to restore the site under the arrays, if the land will not be returned to row crop agriculture, is expected to be limited to over-seeding.

The decommissioning effort will implement best management practices (BMP's) to minimize erosion and to contain sediment on the Project to the extent practicable with the intent of meeting this goal include:

1. Minimize new disturbance and removal of native vegetation to the greatest extent practicable.

2. Removal of solar equipment and all access roads up to full depth, backfill with subgrade material and cover with suitable topsoil to allow adequate root penetration for plants, and so that subsurface structures do not substantially disrupt ground water movements.

3. Any topsoil that is removed from the surface for decommissioning will be stockpiled to be reused when restoring plant communities or agricultural uses. Once decommissioning activity is complete, topsoil will be re-spread to assist in establishing and maintaining plant communities.

4. Stabilize soils and return them to agricultural use or other beneficial use according to the Site Permit, AIMP, VMP and landowner direction.

5. During and after decommissioning activities, install erosion and sediment control measures, such as silt fences, bio-rolls, and ditch checks in all disturbance areas where potential for erosion and sediment transport exists, consistent with storm water management objectives and requirements.

6. Remediate any petroleum product leaks and chemical releases prior to completion of decommissioning.

7. Decommissioning and restoration activities at each site will be completed within 40 weeks after the end of commercial operations of the Project. The Owner will verify drain tile is functional when decommissioning is complete.

1.4 Post-Restoration Monitoring

Decommissioning of the site will comply with permits for a National Pollution Discharge Elimination System Construction Site Run-off (NPDES CSR general permit), Spill Containment and Countermeasure (SPCC) Plan, and Storm Water Pollution Prevention Plan (SWPPP), if grading activities are necessary and exceed applicable permit thresholds. Decommissioning may include post-restoration monitoring as required by the NPDES CSR permit, SWPPP, AIMP, VMP and other applicable requirements. In addition, the Owner's Field Representative assigned to decommissioning monitoring will stay in contact with the landowner, including onsite check-ins until the NPDES CSR permit is closed.

1.5 Financial Assurance Plan

Hayward Solar LLC will be financially responsible to decommission the Project, which will include removal of all equipment, improvements, and facilities. The original decommissioning plan approved by the Commission will be updated and reviewed during the 15th year of operation to account for uncertainties in future salvage values, and decommissioning costs. At that time, Hayward Solar LLC will enter into a surety bond agreement, create an escrow account, create a reserve fund, or provide another form of security that will ultimately fund decommissioning and site restoration costs after Project operations cease, to the extent that the salvage value does not cover decommissioning costs. Hayward Solar LLC will decommission the Project in accordance with the conditions outlined in the PUC Site Permit. Hayward Solar LLC will notify the appropriate landowners and local governing bodies of the decommissioning schedule. Hayward Solar LLC has included an obligation to decommission the Project components in applicable real estate agreements.

1.6 Estimated Decommissioning Costs

The decommissioning costs are calculated using current 2020-2021 pricing. In keeping with the requirements of many jurisdictions the estimate of net costs should be updated periodically to recognize price trends for both decommissioning costs and the salvage and resale values of the components. This estimate is based on the first five years of Project operation which is anticipated to begin commercial operation in 2023. Subsequent revisions to the decommissioning plan and cost estimate may be required based on changes in construction techniques and technology, changing material scrap or resale values and as required by the Site Permit.

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. 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 years of use as warrantied by the manufacturer (not more than 0.5 percent per year).

The estimated cost for decommissioning is approximately $11,700,000. Salvage and resale value is estimated at approximately $17,900,000, resulting in a net surplus of approximately $6,200,000. As a condition of the Site Permit issued by the Commission, the posting of a bond, letter of credit, or the establishment of an escrow account to ensure proper decommissioning may be necessary.

For additional detail on the assumptions made see Section 1.7.

Table 1: Cost estimate

Hayward Solar Project				
Project Size	217.94	MW-DC	150.00	MW-AC
	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization	1	Lump Sum	$736,700.00	$736,700
Mobilization was estimated to be approximately 7% of total cost of other items.				
Permitting				
State Permits	1	Lump Sum	$10,000.00	$10,000
Subtotal Permitting				**$10,000**
Decommissioning will require a SWPPP and SPCC plan, cost is an estimate of the permit preparation cost				
Civil Infrastructure				
Removal Gravel Surfacing from Road	15,837	Cubic Yards (BV)	$2.47	$39,158
Haul Gravel Removed from Road (Austin, MN)	19,797	Cubic Yards (LV)	$9.57	$189,447
Disposal of Gravel Removal from Road (Use as Daily Cover)	25,656	Tons	$0.00	$0
Removal Low Water Crossing from Road	11	Each	$3,400.00	$37,400
Haul Low Water Crossing Materials Removed from Road	440	Ton	$7.02	$3,088
Disposal of Low Water Crossing Materials	440	Ton	$30.00	$13,200
Grade Road Corridor (Re-spread Topsoil)	40,088	Linear Feet	$1.55	$62,131
Decompaction on Road Area	14.14	Acres	$418.71	$5,919
Removal of Security Fence (Agricultural Fence)	291,920	Linear Feet	$3.14	$916,629
Subtotal Civil Infrastructure				**$1,266,971**
Structural Infrastructure				
Removal Steel Foundation Posts (Arrays, Equipment, Met Towers)	70,359	Each	$12.91	$908,135
Haul Array Steel Post (Austin, MN)	3,972	Tons	$6.15	$24,414
Removal of Tracker Racking per String	15,984	Each	$95.09	$1,519,975
Haul Tracker Racking (Austin, MN)	12,000	Tons	$6.15	$73,759
Subtotal Structural Infrastructure				**$2,526,283**
Steel removal costs were calculated by using RS Means information for demolition of steel members.				
Hauling calculations are based on the locations of metals recyclers.				
Electrical Collection/Transmission System				
Removal of PV Panels	431,568	Each	$5.27	$2,274,723
Haul PV 95% of Panels to Reseller (Westchester, NY)	12,609	Tons	$231.73	$2,921,876
Haul 5% of PV Panels for Disposal (Austin, MN)	664	Tons	$7.02	$4,657
Removal of Equipment Skids	66	Each	$1,522.17	$100,463
Remove Equipment Pad Frames and Foundations	66	Each	$5,908.70	$389,974
Haul Concrete Foundations	81	Tons	$4.20	$341
Disposal of Concrete from Transformer Foundation	81	Tons	$80.00	$6,496
Haul Equipment to Recycler (Albany, MN)	66	Each	$820.58	$54,158
Remove, Haul, and Dispose of Timber Transmission Poles	1	Each	$1,000.00	$1,000
Remove and Haul Overhead Power Cables	500	Linear Feet	$5.96	$2,980
Removal of Scada Equipment	1	Each	$2,000.00	$2,000
Removal of DC Collector System Cables (copper)	150.0	Per MW	$2,000.00	$300,000
Removal of Underground (AC) Collector System Cables	66	Locations	$400.00	$26,400
Load and Haul Cables for Recycling	295.1	Tons	$6.15	$1,814
Subtotal Electrical Collection/Transmission System				**$6,086,883**
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.				

Substation				
Disassembly and Removal of Main Power Transformer(s)	1	Each	$4,500.00	$4,500
Freight Transformer(s) Offsite	50	Tons	$32.82	$1,641
Disposal of Transformer (Including Oil) (Salvage Value)	1	Each	$0.00	$0
Excavate Around Transformer Foundation(s)	1	Each	$2,146.32	$2,146
Remove Complete Transformer Foundation(s)	40	Cubic Yards	$123.99	$4,960
Backfill Excavation Area from Transformer Foundation Removal	120	Cubic Yards	$39.48	$4,738
Haul Concrete (Transformer, Switch Gear, etc. Foundations)	162	Tons	$7.02	$1,140
Disposal of Concrete from Transformer Foundation	162	Tons	$75.00	$12,180
Demolish Substation Site Improvements (fences, etc)	1	LS	$3,500.00	$3,500
Demolish Control Building and Foundation	1	LS	$12,000.00	$12,000
Remove Medium/High Voltage Equipment	1	LS	$3,500.00	$3,500
Remove Structural Steel Substation Frame	1	LS	$3,500.00	$3,500
Haul - Demolition Materials, Removed Equipment & Structural Steel	40	Tons	$6.15	$246
Disposal of Demolition Materials & Removed Equipment	10	Tons	$75.00	$750
Remove and Load Gravel Surfacing from Substation Site	741	Cubic Yards (BV)	$2.47	$1,831
Haul Gravel Removed from Substation Site	926	Cubic Yards (LV)	$9.57	$8,861
Disposal of Gravel from Substation Site (Use as Daily Cover)	1,200	Tons	$0.00	$0
Grade Substation Site	30,000	SF	$0.06	$1,937
Erosion and Sediment Control at Substation Site	700	LF	$1.92	$1,344
Decompact Substation Site (Subsoiling)	0.69	Acres	$418.71	$288
Revegetation at Substation Site	0.69	Acres	$11,422.40	$7,867
Subtotal Substation				**$76,929**
Site Restoration				
Stabilized Construction Entrance	2	Each	$2,000.00	$4,000
Perimeter Controls (Erosion and Sediment Control)	56,122	Linear Feet	$1.92	$107,754
Permanent Seeding on roadway area	14.1	Acres	$11,422.40	$161,464
Till to Framable Condition at array areas	1,198	Acres	$236.80	$283,728
Subtotal Site Restoration				**$556,946**
Project Management				
Project Manager (half time)	40	Weeks	$3,800.00	$152,000
Superintendent (half time)	40	Weeks	$3,525.00	$141,000
Field Engineer	40	Weeks	$2,775.00	$111,000
Clerk	40	Weeks	$750.00	$30,000
Subtotal Project Management				**$434,000**
Standard industry weekly rates from RS Means. 40 week schedule used.				
Subtotal Demolition/Removals				**$11,694,711**
Salvage				
Fencing (Agricultural)	452	Tons	$157.50	$71,265
Fencing (Chain Link)	7	Tons	$157.50	$1,090
Steel Posts	3,972	Tons	$157.50	$625,575
Module Racking	12,000	Tons	$157.50	$1,889,968
PV Modules	409,990	Each	$34.25	$14,040,222
Transfomers and Inverters	2,171,400	Pounds	$0.26	$553,707
Substation Transformers (Metals)	100,000	Pounds	$0.26	$25,500
Transformers (Oil)	41,225	Gallons	$0.70	$28,858
DC Collection Lines	531,090	Pounds	$1.14	$605,443
AC Collection Lines	59,010	Pounds	$0.56	$33,193
Subtotal Salvage				**$17,874,820**

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.				
Total Demolition Minus Salvage				**($6,180,110)**
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.				

1.7 Decommissioning Assumptions

To develop a cost estimate for the decommissioning of the Hayward 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 Table 1 in the cost estimate spreadsheet.

Westwood developed time and material based estimates considering composition of work crews and equipment and material required using RS Means data. RS Means is a construction industry recognized service providing cost data for used in developing construction cost estimates. When materials have a salvage value at the end of a given project life, the construction activity costs and from the hauling/freight cost are separated from the disposal costs or salvage value to make revisions to salvage values more transparent.

1. Decommissioning year is based on a 5 year initial period for the financial security. The projected life of the Project is 30 years.
2. This Cost Estimate is based on the Project Preliminary drawings (dated 03/15/21) and data provided by Tenaska, Inc. and Aervon.
3. A project of this size and complexity requires a full time project manager or support staff during decommissioning.
4. Common labor will be used for the majority of the tasks except for heavy equipment operation. Since Minnesota Department of Transportation (MnDOT) unit prices are used, where possible, the labor rates will reflect union labor rates.
5. Mobilization was estimated at approximately 7% of total cost of other items.
6. Permit applications required include 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 using a 16 foot width and an 8 inch thickness for the access roads. Substation aggregate is included in the substation quantities. Since the material will not remain on site, a hauling cost is added to the removal cost. Road aggregate can often be disposed of by giving to landowners for use on driveways and parking areas. Many landfills will accept clean aggregate for use as “daily cover” and do not charge for the disposal.
8. Grade Road Corridor reflects the cost of mobilizing and operating light equipment to spread and smooth the topsoil stockpiled on site 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 and surrounding all on-site wetlands.
10. Topsoil is required to be stockpiled on site during construction, therefore this topsoil is available on site to replace the road aggregate, once removed. Subsoiling cost to decompact roadway

areas is estimated as $418.71 per acre (based on MnDOT bid prices). Revegetation on removed substation area, which includes seed, fertilizer, lime, and care until vegetation is established is $11,422 per acre. Tilling to an agriculture ready condition is estimated as $236 per acre (based on MnDOT bid prices for Soil Bed Preparation). The majority of the Project Area is tilled to agriculture ready condition since the decommissioning activities are not expected to eliminate the existing grasses and vegetation under the arrays or heavily compact the soils. Array areas tilled to agriculture ready condition will require little restoration effort, fertilizer, or lime since the arrays will have been planted with native perennial seed mixes, and the soils will have been rejuvenated by being planted as prairie and removed from intense farming.

11. Fence removal includes loading, hauling, and recycling or disposal. Fence and posts weigh approximately 10 pounds per foot.
12. Array support posts are generally lightweight “I” beam sections installed with a piece of specialized tracked equipment. Crew productivity is approximately 240 posts per day, and the same crew and equipment should have a similar productivity removing the posts, resulting in a per post cost of approximately $13.00.
13. A metal recycling facility (SKB Lansing Landfill) is located in Austin, Minnesota is 15 miles from the Project site. Pricing was acquired from www.scrapmonster.com. The posts weigh approximately 150 pounds each, and we estimate the hauling costs at approximately $0.28 per ton mile. The pricing from Scrapmonster is adjusted to 75 percent of the published price to reflect the processing required for the posts to fit recycling requirements and SKB Lansing Landfill’s margin.
14. Based on the review of a manufacturer’s details of the array support structures the structures weigh approximately 15 pounds per linear foot of array. The facility has 431,568 modules, for a total module weight of 13,273 tons. The tracker arrays are made of steel pipe, and mounted on the foundation piles, which the panels are bolted to. A crew with hand tools can disassemble and cut the pieces to sizes for recycling at a rate of about 240 four foot long pieces per person per day based on RS Means cost data.
15. Hauling the steel to Austin, MN costs about $6.15 per ton.
16. The solar panels rated at 505 watts measure approximately 3.71 feet by 7.24 feet and weigh 61.5 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.
17. Based on preliminary design information, 3510 kVA inverters will be used on this Project. Inverters and transformers are going to be a part of a concrete equipment skid, mounted on a pile foundation. This equipment skid will approximately measure 22’ long. The total weight of the cabinet including the inverter, transformer, and other electrical equipment will be 32,900 pounds each, and can be disconnected by a crew of electricians and lifted by a small crane for transport to the recycler. They contain copper or aluminum windings.
18. 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 the concrete pads and conduits feeding the equipment.
19. Medium voltage (MV) equipment and SCADA equipment are mounted on the same concrete pad as the transformer and enclosed in weather proof cabinets. Their size requires light equipment to remove them. The costs shown include the removal of the concrete pads.
20. The underground collector system cables are placed in trenches, inside of PVC conduits, with a minimum of 3 feet of cover.

21. To reduce tracking of sediment off-site by trucks removing materials, we have included a rock construction entrance priced based on MnDOT bid prices.
22. Perimeter control pricing is based on a sediment fence placed on the downgrade side of the work area perimeters, and protecting wetlands and drainage swales within the Project Area. Pricing is based on RS Means unit prices.
23. No topsoil will be removed from the landowner's property or used on other landowners' property during decommissioning. Most of the site will not have been compacted by heavy truck or equipment traffic so no top soil will need to be imported, and very few areas will need to be decompacted.
24. Metal salvage prices (steel, aluminum, copper) are based on quotes from www.scrapmonster .com for the U.S. Midwest in December 2020. These prices are based on delivery to the recycling facility with the material prepared to meet size, thickness, cleanliness and other specifications. A reduction of 25% has been taken from this price to reflect the difficulty of realizing the full spot prices posted. The prices are three months old at the time they are displayed on the website.
25. The steel posts and array racking are priced based on 75 percent of the HMS (high melt steel) 80/20 the price listed on www.scrapmonster.com in September, 2020. ($210 per ton)
26. Solar module degradation is approximately 0.50% per year, or 96% of capacity remaining after 5 years, and 83 percent capacity remaining after 30 years. The manufacturer guarantees that panels will have 98 percent the rated capacity when new, so combining the guaranteed capacity and the degradation, the estimate uses 96 percent capacity after five years. There is currently a robust market for used solar panels and pricing can be found on Solar Biz, eBay and other sites. New entrants in the market include We Recycle Solar, which markets used panels in Asia, Africa, and South America. 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 a pricing of 80 percent of the $0.0875 per watt price quoted by We Recycle Solar for a similar project within the last two months. The price is based on the buyer transporting panels placed on pallets from the Project site to a We Recycle Solar facility.
27. There is an active market for reselling and recycling electrical transformers and inverters with several national companies specializing in recycling. We have assumed that the electrical equipment will be obsolete at the time of decommissioning so we have based the pricing on a percentage of the weight that reflects the aluminum windings that can be salvaged. Pricing was obtained from scrapmonster.com in September 2020, for used transformer scrap at a price of $0.36 per pound.
28. 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 Midwest price of #2 copper wire with an 85 percent recovery rate as found on www.scrapmonster.com in September 2020, which is $1.53 per pound. For the salvage value we have assumed 75 percent of the published price.
29. The underground collection lines are assumed to be aluminum conductor. The majority of the length of the collection lines will be buried deep enough so that it does not have to be removed. Those sections coming up out of the ground at junction boxes, or otherwise, can be salvaged. The salvage value is based on the Midwest price of E.C. Aluminum Wire as found on www.scrapmonster.com in September 2020, which is $0.79 per pound. We have reduced the price to 50 percent of the quoted price to reflect the complications of stripping insulation and separating the materials.

30. 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.
31. All salvage is based on the weights of bulk material or equipment.