

January 14, 2019

VIA E-MAIL AND FEDERAL EXPRESS

Mr. Darrell Nitschke
Executive Secretary
North Dakota Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, ND 58505-0480

**RE: Harmony Solar ND, LLC's Application for a Certificate of Site Compatibility
for the Harmony Solar Project in Cass County, North Dakota
Case No. PU-18-219/OAH File No. 20180389**

Dear Mr. Nitschke:

Based on comments made by the North Dakota Public Service Commission ("Commission") during its working session in the above-captioned matter on December 17, 2018, Harmony Solar ND, LLC ("Harmony Solar"), has revised the Decommissioning Plan provided in Late-Filed Exhibit No. 15. Therefore, enclosed for filing are an original and ten (10) copies of this letter and Harmony Solar's Revised Late-Filed Exhibit No. 15. Electronic versions of this letter and the enclosed documents were filed today with the Commission via e-mail.

If you have any questions, please let me know.

Sincerely,



MOLLIE M. SMITH

MMS/ms/65695549
Enclosures

cc: Judge Timothy J. Dawson (via e-mail, w/ encl.)
John Schuh (via e-mail, w/ encl.)
Patrick Fahn (via e-mail, w/ encl.)
Betsy Engelking (via e-mail, w/ encl.)
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Harmony Solar ND, LLC
Harmony Solar Project
Docket No. PU-18-219

Revised Late-Filed Exhibit No. 15 – Decommissioning Plan

North Dakota does not have specific decommissioning plan or financial assurance requirements for solar facilities. However, Harmony Solar ND, LLC (“Harmony Solar”), is committed to ensuring the Project is properly decommissioned at the end of its useful life. Therefore, Harmony Solar commits to the following with respect to decommissioning restoration and financial assurance for the Harmony Solar Project.

Project Decommissioning and Site Restoration:

Decommissioning of the Project would begin within twelve (12) months after abandonment or the end of its useful life, and would be completed within twenty-four (24) months after abandonment or the end of its useful life, unless the Commission approves a different schedule. Project decommissioning will include:

- Removing all facilities to a depth of four feet below grade. Any soil disturbance associated with decommissioning would include topsoil segregation.
- Removing the operation and maintenance facility and access roads, unless the landowners request in writing that a facility remain in place and the Commission approves the request.
- Restoration of the Project site, including: decompaction; revegetation; and reclamation to the approximate original topography that existed prior to construction of the facility with topsoil respread over the disturbed areas at a depth similar to that in existence prior to the disturbance.

Following decommissioning, the site will be restored so as to be able to return to the agricultural production that existed prior to construction of the solar facilities.

Decommissioning Financial Assurance:

Harmony Solar would provide the following financial assurance for the Project equal to the following:

- Fifty percent (50%) of the Project’s estimated decommissioning cost prior to commercial operation;
- One hundred percent (100%) of the Project’s decommissioning cost at year 10 of operation.

Harmony Solar also proposes that an updated decommissioning cost estimate be provided at year 10 of operation, which would be used to update, as needed, the decommissioning cost financial

security required at year 10 of operation. Harmony Solar will provide financial assurance in the form of an irrevocable letter of credit.

A decommissioning cost estimate for the Project provided by Westwood Engineering (a North Dakota-licensed engineering firm) is attached as **Exhibit A**. The total estimated cost to decommission the Project is \$8,932,776. Therefore, the initial twenty-five percent (50%) of the Project's estimated decommissioning cost estimate for the Project is \$4,466,388.

As compared to the framework proposed above by Harmony Solar, providing 100 percent of the Project's estimated decommissioning cost prior to commercial operation would cost approximately \$600,000 more in fees to maintain the irrevocable letter of credit. As discussed further below, because of the high level of reliability of the solar modules that would be used by Harmony Solar for the Project, this additional cost does not provide a corresponding benefit.

Harmony Solar will source solar modules from Bloomberg New Energy Finance Tier 1 manufacturers that provide third-party verification of their module performance, as well as warranties on the module output, such as Jinko, First Solar, Trina, and Hanwha. These manufacturers are among the most well-established module vendors in the industry, with all four ranking as a top performer in DNV GL's 2018 PV Module Reliability Scorecard.¹

As a routine part of their production process, these manufacturers engage third-party quality certification companies, such as TUV and DNV GL, to provide an independent analysis of and reports regarding their manufacturing processes, quality control programs, and end-product performance testing. These reports are used to demonstrate company and technology bankability. Any modules selected by Harmony Solar for the Project will be warrantied to produce more than 80 percent of their nameplate capacity after 25 years of service. In addition to performance level warranties, the panels will also have equipment defect warranties for a period of 25-30 years. Further, analysis of solar panel modules conducted by the National Renewable Energy Laboratory in 2014 concluded that "[a]bout 90% of the normal systems and about 85% of all systems, including systems with known issues, performed to within 10% or better of expected performance."²

Given the high level of demonstrated reliability of the class of solar panels that will be used for the Project, and the high value in continued operation of the Project once constructed, Harmony Solar believes the additional cost of providing full decommissioning cost financial assurance prior to commercial operation is not warranted.

¹ Available at <https://www.dnvgl.com/news/2018-pv-module-reliability-scorecard-121786>.

² See Jordan, D.C., and S.R. Kurtz, *Reliability and Geographic Trends of 50,000 Photovoltaic Systems in the USA* (Sept. 2014), available at <https://www.nrel.gov/docs/fy14osti/62801.pdf>.

Project Name: Harmony Solar ND,LLC
Date:December 19, 2018
WPS Project Number: 0007695.00
By: BTB

Project Size	260.00	MW-DC	200.00	MW-AC
	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization	1	Lump Sum	\$660,000.00	\$660,000

Mobilization was estimated to be approximately 7% of total cost of other items. This number was developed from speaking with contractors.

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	40,870	Cubic Yards (BV)	\$3.85	\$157,452
Haul Gravel Removed from Road	51,088	Cubic Yards (LV)	\$9.56	\$488,397
Disposal of Gravel Removal from Road	75,865	Tons	\$0.00	\$0
Removal Geotextile Fabric from Road Area	183,000	Square Yards	\$1.40	\$256,200
Haul Geotech Fabric Removed from Beneath Access Roads	183,000	Square Yards	\$0.20	\$36,600
Disposal of Geotech Fabric Removed from Beneath Access Roads	183,000	Square Yards	\$0.10	\$18,300
Removal Culvert from Beneath Road	3	Each	\$700.00	\$2,100
Haul Culvert Removed from Road	3	Each	\$100.00	\$300
Disposal of Culverts	3	Each	\$10.00	\$30
Grade Road Corridor (Re-spread Topsoil)	102,945	Linear Feet	\$1.22	\$126,005
Erosion and Sediment Control for Road Restoration	0	Linear Feet	\$1.87	\$0
Turf Establishment on Removed Road Area	56.72	Acres	\$1,000.00	\$56,719
Removal of Security Fence	54,663	Linear Feet	\$0.83	\$45,370
Subtotal Civil Infrastructure				\$1,187,472

Civil removal costs are a combination of NDDOT unit costs where applicable, RS Means cost for Fargo, ND, and industry standards provided t

Structural Infrastructure				
Removal Tracker Steel Foundation Posts	0	Each	\$13.00	\$0
Haul Tracker Steel Post	0	Tons	\$5.00	\$0
Removal Drive Motor Posts	0	Each	\$15.00	\$0
Haul Drive Motor Posts	0	Ton	\$5.00	\$0
Removal Tracker Racking	0	Each	\$150.00	\$0
Haul Tracker Racking	0	Ton	\$5.00	\$0
Subtotal Structural Infrastructure				\$0

Removal and hauling of steel to be sub contracted out, and material removed to be given to sub contractor

Electrical Collection/Transmission System				
Removal of PV Panels	790,560	Each	\$6.41	\$5,067,490
Removal of Combiner Boxes	1,680	Each	\$60.00	\$100,800
Removal of PCU Station (Inverters/Panelboard/Transformer)	80	Each	\$2,000.00	\$160,000
Removal of Scada Equipment	0	Each	\$5,000.00	\$0
Removal of DC Collector System Cables (copper)	200.0	Per MW	\$3,000.00	\$600,000
Removal of Underground (AC) Medium Voltage System Cables	900	Linear Foot	\$4.00	\$3,600
Load and Haul Cables for Recycling	500.0	Ton	\$8.25	\$4,125
Removal of Fiber Optic Cable	200.0	Per MW	\$1,000.00	\$200,000
Subtotal Electrical Collection/Transmission System				\$6,136,015

Electrical removal costs of PV Panels and Combiner Boxes were based industry standards on installation rates of a two man work crew. PCU Station, MV Equipment and Scada Equipment removal cost are based on removal of equipment, concrete pads, and conduits using a truck mounted crane and contractor provided information on installation rates.

Cable removal assumed using trenching, standard industry production rates from RS Means.

Site Restoration

Stabilized Construction Entrance	1	Each	\$2,000.00	\$2,000
Perimeter Controls	29,080	Linear Feet	\$1.86	\$54,089
Permanent Seeding on area within Removed Array	1,200	Acres	\$736.00	\$883,200
Subtotal Site Restoration				\$939,289

Site restoration costs are based on past solar project experience.

Subtotal Demolition/Removals **\$8,932,776**

Salvage

Fencing	273	Tons	\$234.50	\$64,092
Steel Posts	0	Tons	\$203.00	\$0
Module Racking	0	Tons	\$251.25	\$0
PV Modules	0	Each	\$11.62	\$0
Inverters and Transformers	80	Each	\$6,809.08	\$544,726
DC Collection Lines	1,000,000	Pounds	\$0.52	\$515,000
AC Collection Lines	1,350	Pounds	\$0.26	\$348

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.

Subtotal Salvage **\$1,125,166**

Total Demolition Minus Salvage **\$7,807,610**

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.

This document was originally issued and sealed by Eric Shuler, Registration Number PE-10942 on December 19th, 2018. The original documents are stored at Westwood Professional Services, 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343

Signature: _____
 Typed or Printed Name: Eric Shuler
 Date: 12-19-2018 License Number: PE-10942

