Champaign County
Department of
PLANNING &
ZONING

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CASES 903-S-18, 906-S-18, and 907-S-18

SUPPLEMENTAL MEMORANDUM #1
September 13, 2018

Petitioners: **FFP IL Community Solar LLC, 100 Montgomery Street, Suite 725, San Francisco, CA 94104, via agent David Dickson, and participating landowners the Mildred Catherine Wolf Trust, Mildred Catherine Wolf, Trustee, and Judith K. Wertz**

Request: **Case 903-S-18**

Authorize two Community PV Solar Farms, each with a nameplate capacity of 2 megawatts (MW) for a total of 4 MW, including access road and wiring, in the AG-1 Agriculture Zoning District, and including the following waivers of standard conditions:

Note: Some waivers have been revised based on new evidence received after the required legal advertisement was submitted.

Part A: A waiver for a separation of ~~0~~ 218 feet in lieu of the minimum required 240 feet between the PV Solar Farm and non-participating properties 10 acres or less in area, per Section 6.1.5 D.(3)a. of the Zoning Ordinance.

Part B: A waiver for a distance of ~~1,000~~ 425 feet from the CR Conservation Recreation Zoning District in lieu of the minimum required one-half mile (2,640 feet), per Section 6.1.5 B.(2)b.

Part C: A waiver for a 33 feet wide area for all necessary access lanes or driveways and any required new PRIVATE ACCESSWAYS in lieu of the minimum required 40 feet, per Section 6.1.5 B.(1)b. of the Zoning Ordinance.

Part D: A waiver for 0 feet between the PV SOLAR FARM fence and the nearest property line in lieu of the minimum required 10 feet, per Section 6.1.5 D.(3)b. of the Zoning Ordinance.

Part E: A waiver for 20 feet between PV SOLAR FARM solar equipment other than inverters and the nearest property line of any lot more than 10 acres in area, in lieu of the minimum required 26 feet, per Section 6.1.5 D.(8) of the Zoning Ordinance.

Part F: Not providing a Decommissioning and Site Reclamation Plan that include cost estimates prepared by an Illinois Licensed Professional Engineer prior to consideration of the Special Use Permit by the Board, per Section 6.1.1 A.3.

Part G: Not entering into a Roadway Upgrade and Maintenance Agreement or waiver therefrom with the relevant local highway authority prior to consideration of the Special Use Permit by the Board, per Section 6.1.5 G.

Case 906-S-18

Authorize a Community PV Solar Farm with a total nameplate capacity of 2 megawatts (MW), including access road and wiring, in the AG-1 Agriculture Zoning District, and including the following waivers of standard conditions:

Note: Some waivers have been revised based on new evidence received after the required legal advertisement was submitted.

Part A: A waiver for a separation of 38 ~~223~~ feet in lieu of the minimum required 240 feet between the PV Solar Farm and non-participating properties 10 acres or less in area, per Section 6.1.5 D.(3)a. of the Zoning Ordinance.

Part B: A waiver for a distance of 200 feet from the CR Conservation Recreation Zoning District in lieu of the minimum required one-half mile (2,640 feet), per Section 6.1.5 B.(2)b.

Part C: Not providing a Decommissioning and Site Reclamation Plan that include cost estimates prepared by an Illinois Licensed Professional Engineer prior to consideration of the Special Use Permit by the Board, per Section 6.1.1 A.3.

Part D: Not entering into a Roadway Upgrade and Maintenance Agreement or waiver therefrom with the relevant local highway authority prior to consideration of the Special Use Permit by the Board, per Section 6.1.5 G.

Part E: A waiver for a separation distance of 0 feet in lieu of 275 feet between a PV SOLAR FARM electrical inverter and the PV SOLAR FARM perimeter fence, per Section 6.1.5 D.(6) of the Zoning Ordinance.

Case 907-S-18

Authorize two Community PV Solar Farms, each with a nameplate capacity of 2 megawatts (MW) for a total of 4 MW, including access road and wiring, in the AG-1 Agriculture Zoning District, and including the following waivers of standard conditions:

Note: Some waivers have been revised based on new evidence received after the required legal advertisement was submitted.

Part A: A waiver for a separation of 224 feet in lieu of the minimum required 240 feet between the PV Solar Farm and non-participating properties 10 acres or less in area, per Section 6.1.5 D.(3)a. of the Zoning Ordinance.

~~Part B: A waiver for a distance of 230 feet from the CR Conservation Recreation Zoning District in lieu of the minimum required one-half mile (2,640 feet), per Section 6.1.5 B.(2)b.~~

~~Part C: A waiver for not including a signed Decommissioning and Site Reclamation Plan with the Special Use Permit application, per Section 6.1.5 Q.~~

~~Part D. A waiver for not providing a visual screen for any part of the PV SOLAR FARM that is visible to and located within 1,000 feet of an existing DWELLING or residential DISTRICT, per Section 6.1.5 M.(2)a.~~

Part B: A waiver for a distance of 238 feet in lieu of one-half mile (2,640 feet) between a municipal boundary and a PV SOLAR FARM, per Section 6.1.5 B.(2) of the Zoning Ordinance.

Part C: A waiver for locating a PV SOLAR FARM within the Contiguous Urban Growth Area (CUGA) in lieu of outside the CUGA, per Section 6.1.5 B.(2) of the Zoning Ordinance.

Part D: A waiver for a separation distance of 247 feet in lieu of 275 feet between a PV SOLAR FARM electrical inverter and the PV SOLAR FARM perimeter fence, per Section 6.1.5 D.(6) of the Zoning Ordinance.

Part E: Not providing a Decommissioning and Site Reclamation Plan that include cost estimates prepared by an Illinois Licensed Professional Engineer prior to consideration of the Special Use Permit by the Board, per Section 6.1.1 A.3.

Part F: Not entering into a Roadway Upgrade and Maintenance Agreement or waiver therefrom with the relevant local highway authority prior to consideration of the Special Use Permit by the Board, per Section 6.1.5 G.

Other waivers may be necessary.

Location:

903-S-18: **A 121.79-acre tract comprised of part of Lot D of the Proprietor's Survey of Lands Subdivision in Section 11 of Township 18 North, Range 10 East of the Third Principal Meridian in Sidney Township, and commonly known as the field east of the house located at 2232A CR 1000N, Sidney.**

906-S-18: **A 40-acre tract in the Northeast Quarter of the Southeast Quarter of Section 3 of Township 19 North, Range 10 East of the Third Principal Meridian in St. Joseph Township, and commonly known as the farmland approximately 600 feet north of Schuren Nursery on the west side of CR 2200E.**

907-S-18: **A 153.23-acre tract in the Northwest Quarter of Section 12 of Township 19 North, Range 10 East of the Third Principal Meridian in St. Joseph Township, and commonly known as the farmland at the southwest corner of CR 2350E and CR 1700N.**

Time Schedule for Development**:** **As soon as possible**

Prepared by: **Susan Burgstrom**
Senior Planner

John Hall
Zoning Administrator

STATUS

For all 3 cases: 903-S-18, 906-S-18, and 907-S-18

- Attachment A is an analysis of assessed values for each subject property, provided by ZBA Board Member Frank DiNovo.

- Zoning Administrator John Hall provides a discussion of decommissioning costs below.

Specific to Case 906-S-18

- An incorrect lot size was provided for the property just north of the proposed solar farm site. The 11.2-acre property is actually a 10-acre property, and this will affect how the approved solar farm ordinance applies to that property. Waiver Part A needs to be reduced from 223 feet to 38 feet in lieu of the minimum required 240 feet because that property is now classified as a non-participating property that is 10 acres or less in area rather than one that is more than 10 acres in area.

- P&Z Staff revised the Annotated Aerial: Separation Distances and Screening to correct the lot size to the north and to add the estimated 36.9 decibel (dB) noise level for the residential property east of the inverters. See Attachment B.

DECOMMISSIONING COSTS

Attachment C is the decommissioning cost estimate from the SUP Application for Case 906-S-18. Decommissioning cost estimates were not analyzed for Cases 903-S-18 and 907-S-18 due to inconsistencies in the cost estimates.

Attachment D is an updated table of decommissioning costs for various solar farms and includes proposed decommissioning costs for 9 proposed PV solar farms at various locations around the country plus an example decommissioning cost from New York State. An earlier version of this table was prepared for Supplemental Memorandum #2 in Cases 894-S-17 and 897-S-18 and the proposed decommissioning costs from those cases have been added to the table. Note the following regarding the various locations around the country:

1. Costs are reported from various years and have not been standardized to current costs.

2. Critical data regarding the type of racking system being decommissioned is missing in most instances and is only known for Fast Sun LLC and RE Kammerer Holdings (both of which are single axis tracker arrays); Fleshman/Kost Road (a fixed tilt array). The proposed Champaign County solar farms use the single axis tracker array.

3. Other critical data regarding site specific considerations such as local cost considerations, remoteness of site, and physical considerations related to site restoration are missing.

Proposed Decommissioning Cost for Case 906-S-18

The proposed decommissioning cost for Case 906-S-18 seems to be more comprehensive than costs seen in other recent solar farm cases.

The only cost that seems to be missing is the cost of removing the vegetative screen.
The proposed salvage values seem consistent with scrap values posted on Scrapmonster.com.

Comparing the Proposed Decommissioning Costs to Other Locations

The comparison to other locations yields the following results:

1. The proposed decommissioning cost for Case 906-S-18 is most similar to the proposed decommissioning costs for Fast Sun LLC. Attachment E is the proposed decommissioning costs for Fast Sun LLC. Fast Sun LLC had a net cost of $4,923 per acre in 2017 dollars. The proposed net decommissioning cost for Case 906-S-18 is $4,744 per acre.

2. The proposed salvage value for Case 906-S-18 is $94,274.50 per megawatt which is about 90% of the proposed salvage value per megawatt for Fast Sun LLC. Overestimation of salvage value will lead to an insufficient Letter of Credit for actual decommissioning.

3. Salvage values for PV panels are difficult to estimate and for that reason are not included in some estimates. For Champaign County zoning cases, it would make sense to include salvage values for PV panels provided there is serious effort made to report a realistic salvage value at each financial assurance update. That way, as the financial assurance is updated over time, the estimate of salvage value can incorporate advances that may be made in salvaging and recycling of PV panels.

4. A special condition has been proposed to require a decommissioning cost estimate by an Illinois Professional Engineer prior to authorization of a Zoning Use Permit.

ATTACHMENTS

A Assessment values analysis submitted by Frank DiNovo on September 11, 2018

B Annotated Aerial: Separation Distances and Screening, revised by P&Z Staff on September 13, 2018

C Decommissioning Activities excerpt from SUP Application for Case 906-S-18

D Solar Farm Decommissioning Costs for Various Solar Farms Including Proposed Costs for Current Solar Farm Zoning Cases dated September 13, 2018

E Fast Sun LLC Decommissioning Plan for Single Axis Tracker Array

F Case 894-S-17 Preliminary Memorandum Attachment C: Decommissioning Plan St. Joseph Solar Farm

G Cases 894-S-17 and 897-S-18 Supplemental Memorandum #2 dated August 30, 2018, with attachments:
   - A Solar Farm Decommissioning Costs from Various Solar Farms Including Proposed Costs for Cases 894-S-17 and 897-S-18
   - B Fact Sheet: Decommissioning Solar Panel Systems (NYSERDA)
   - C Exhibit F: Decommissioning Plan for Devine-Johnson Solar Project (NEXTERA)
   - D Proposed Decommissioning Cost Estimate for South Forty Solar Farm
   - E Removal Cost Estimate for Proposed 2.7 MW Solar Farm in Chester NY by Norman Dupuis

CASE 903-S-18 Community Solar, LLC and Mildred Catherine Wolf Trust

Property Tax Valuation as provided in PA 100-0781

	Notes Re: Sources					
ASSESSED VALUE PER MW	1					Average
Year			1	19	25	Over 25 Years
Trended Real Property Cost Basis at average inflation rate shown:		2.0%	218,000	311,358	350,639	279,304
Allowance for Phsyical Depreciation				-219,782	-330,013	-148,615
Assessment Floor (30% of Trended Real Prop Cost Basis)			65,400	93,407	105,192	
Assessed Value per MW (Trended Real Prop Cost Basis minus Depreciation but not less than Assessment Floor)			218,000	93,407	105,192	148,359
PROPOSED PROJECT						
Assessed Value of Proposed Solar Farm with specified capacity in MW	2	4	872,000	373,629	420,767	369,711
EXISTING FARMLAND						
Parcel (PIN: 24-28-11-300-018) Current Assessed Value of Farmland	3	$48,210				
Parcel Total Acreage	3	121.79				
Parcel Average Farmland AV per acre		$396				
Solar Farm Site area in acres:	4	22.59				
Avg.Year to Year Change in Champaign Co. Farmland value 1996-2016:	5	2.7%				
Assessed Value of Project Site Farmland with year to year change at:		2.7%	8,942	14,445	16,949	12,539
NET INCREASE IN ASSESSED VALUE						
Net Change in Assessed Value (Solar Farm minus Project Site Farmland)			863,058	359,184	403,819	357,172

SOURCES

1. The initial value of $218,000 and the 30% floor value are established in PA 100-0781. All calculations are as specified in the Act.
http://www.ilga.gov/legislation/publicacts/fulltext.asp?Name=100-0781&GA=100

2. The capacity is that stated in the petitioner's appliction.

3. Champaign County Assessment Office and Champaign County GIS Consortium
http://www.maps.ccgisc.org/public/Disclaimer.aspx

4. The fenced area indicated in the petitioner's appliction.

5. This is a simple percentage, not a compound rate. Illinois Department of Revenue Property Tax Statistice (Table 17).
http://www.revenue.state.il.us/AboutIdor/TaxStats/

6. Champaign County Rate Book, Champaign County Treasurer and Champaign County Clerk. All calculations use 2017 rates.
http://www.co.champaign.il.us/treasurer/Rates.php,.http://www.co.champaign.il.us/treasurer/taxlookup.php

NET INCREASE IN TAX REVENUE

Year			1	19	25	Average Over 25 Years	25 Year Total	Net Present Value Discount Rate 2%	Net Present Value Discount Rate 5%	Net Present Value Discount Rate 7%
Sidney Twp., Tax Code 1, 2017 Tax Rates (dollars per $100 AV)	6									
101 COUNTY		0.8481	7,320	3,046	3,425	3,029	78,759	61,540	47,367	40,940
201 FOREST PRESERVE		0.0925	798	332	374	330	8,590	6,712	5,166	4,465
301 COMM COLL 505		0.5411	4,670	1,944	2,185	1,933	50,249	39,263	30,221	26,121
348 UNIT SCHOOL 7		4.2661	36,819	15,323	17,227	15,237	396,170	309,558	238,267	205,938
418 SIDNEY FIRE		0.2000	1,726	718	808	714	18,573	14,512	11,170	9,655
737 SIDNEY TWP		0.2285	1,972	821	923	816	21,220	16,580	12,762	11,030
738 SIDNEY RD & BR		0.2525	2,179	907	1,020	902	23,448	18,322	14,102	12,189
739 SIDNEY PERM RD		0.1477	1,275	531	596	528	13,716	10,717	8,249	7,130
740 SIDNEY CEMETERY		0.0000	0	0	0	0	0	0	0	0
Total at Aggregate Rate (All Taxing Bodies)		**6.5765**	**56,759**	**23,622**	**26,557**	**23,489**	**610,725**	**477,206**	**367,305**	**317,468**

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CASE 906-S-18 Community Solar, LLC and Woodward Trust

Property Tax Valuation as provided in PA 100-0781

	Notes Re: Sources					
ASSESSED VALUE PER MW	1					Average
Year			1	19	25	Over 25 Years
Trended Real Property Cost Basis at average inflation rate shown:		2.0%	218,000	311,358	350,639	279,304
Allowance for Phsyical Depreciation				-219,782	-330,013	-148,615
Assessment Floor (30% of Trended Real Prop Cost Basis)			65,400	93,407	105,192	
Assessed Value per MW (Trended Real Prop Cost Basis minus Depreciation but not less than Assessment Floor)			218,000	93,407	105,192	148,359
PROPOSED PROJECT						
Assessed Value of Proposed Solar Farm with specified capacity in MW	2	2	436,000	186,815	210,384	296,718
EXISTING FARMLAND						
Parcel (PIN: 28-22-03-400-012) Current Assessed Value of Farmland	3	$15,290				
Parcel Total Acreage	3	40.00				
Parcel Average Farmland AV per acre		$382				
Solar Farm Site area in acres:	4	14.4				
Avg.Year to Year Change in Champaign Co. Farmland value 1996-2016:	5	2.7%				
Assessed Value of Project Site Farmland with year to year change at:		2.7%	5,493	8,873	10,411	7,703
NET INCREASE IN ASSESSED VALUE						
Net Change in Assessed Value (Solar Farm minus Project Site Farmland)			430,507	177,942	199,973	289,015

SOURCES

1. The initial value of $218,000 and the 30% floor value are established in PA 100-0781. All calculations are as specified in the Act.
http://www.ilga.gov/legislation/publicacts/fulltext.asp?Name=100-0781&GA=100

2. The capacity is that stated in the petitioner's appliction.

3. Champaign County Assessment Office and Champaign County GIS Consortium
http://www.maps.ccgisc.org/public/Disclaimer.aspx

4. The fenced area indicated in the petitioner's appliction.

5. This is a simple percentage, not a compound rate. Illinois Department of Revenue Property Tax Statistice (Table 17).
http://www.revenue.state.il.us/AboutIdor/TaxStats/

6. Champaign County Rate Book, Champaign County Treasurer and Champaign County Clerk. All calculations use 2017 rates.
http://www.co.champaign.il.us/treasurer/Rates.php,.http://www.co.champaign.il.us/treasurer/taxlookup.php

NET INCREASE IN TAX REVENUE

Year			1	19	25	Average Over 25 Years	25 Year Total	Net Present Value with 2% Discount Rate	Net Present Value with 5% Discount Rate	Net Present Value with 7% Discount Rate
St. Joseph Twp., Tax Code 1, 2017 Tax Rates (dollars per $100 AV)	6									
101 COUNTY		0.8481	3,651	1,509	1,696	2,451	63,730	50,872	40,006	34,854
201 FOREST PRESERVE		0.0925	398	165	185	267	6,951	5,548	4,363	3,801
301 COMM COLL 505		0.5411	2,329	963	1,082	1,564	40,660	32,457	25,524	22,237
314 SCHOOL DIST 169		2.6906	11,583	4,788	5,380	7,776	202,182	161,392	126,918	110,575
333 HIGH SCHOOL305C		2.0013	8,616	3,561	4,002	5,784	150,386	120,045	94,403	82,247
419 ST JOE STAN FIRE		0.2940	1,266	523	588	850	22,092	17,635	13,868	12,082
761 ST JOSEPH TWP		0.2820	1,214	502	564	815	21,191	16,915	13,302	11,589
762 ST JOE RD & BR		0.1564	673	278	313	452	11,753	9,381	7,378	6,428
763 ST JOE PERM ROAD		0.1537	662	273	307	444	11,550	9,219	7,250	6,317
Total at Aggregate Rate (All Taxing Bodies)		**7.0597**	**30,393**	**12,562**	**14,117**	**20,404**	**530,494**	**423,465**	**333,014**	**290,130**

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CASE 907-S-18 Community Solar, LLC and Beatrice H. Woodward Trust

Property Tax Valuation as provided in PA 100-0781

	Notes Re: Sources					
ASSESSED VALUE PER MW	1					Average
Year			1	19	25	Over 25 Years
Trended Real Property Cost Basis at average inflation rate shown:		2.0%	218,000	311,358	350,639	279,304
Allowance for Phsyical Depreciation				-219,782	-330,013	-148,615
Assessment Floor (30% of Trended Real Prop Cost Basis)			65,400	93,407	105,192	
Assessed Value per MW (Trended Real Prop Cost Basis minus Depreciation but not less than Assessment Floor)			218,000	93,407	105,192	148,359
PROPOSED PROJECT						
Assessed Value of Proposed Solar Farm with specified capacity in MW	2	4	872,000	373,629	420,767	369,711
EXISTING FARMLAND						
Parcel (PIN: 28-22-12-100-001) Current Assessed Value of Farmland	3	$88,690				
Parcel Total Acreage	3	153.23				
Parcel Average Farmland AV per acre		$579				
Solar Farm Site area in acres:	4	31.2				
Avg.Year to Year Change in Champaign Co. Farmland value 1996-2016:	5	2.7%				
Assessed Value of Project Site Farmland with year to year change at:		2.7%	18,047	29,152	34,206	25,307
NET INCREASE IN ASSESSED VALUE						
Net Change in Assessed Value (Solar Farm minus Project Site Farmland)			853,953	344,477	386,562	344,404

SOURCES

1. The initial value of $218,000 and the 30% floor value are established in PA 100-0781. All calculations are as specified in the Act.
http://www.ilga.gov/legislation/publicacts/fulltext.asp?Name=100-0781&GA=100

2. The capacity is that stated in the petitioner's appliction.

3. Champaign County Assessment Office and Champaign County GIS Consortium
http://www.maps.ccgisc.org/public/Disclaimer.aspx

4. The fenced area indicated in the petitioner's appliction.

5. This is a simple percentage, not a compound rate. Illinois Department of Revenue Property Tax Statistice (Table 17).
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6. Champaign County Rate Book, Champaign County Treasurer and Champaign County Clerk. All calculations use 2017 rates.
http://www.co.champaign.il.us/treasurer/Rates.php,.http://www.co.champaign.il.us/treasurer/taxlookup.php

NET INCREASE IN TAX REVENUE

Year			1	19	25	Average Over 25 Years	25 Year Total	Net Present Value with 2% Discount Rate	Net Present Value with 5% Discount Rate	Net Present Value with 7% Discount Rate
St. Joseph Twp., Tax Code 1, 2017 Tax Rates (dollars per $100 AV)	6									
101 COUNTY		0.8481	7,242	2,922	3,278	2,921	75,943	59,442	45,868	39,708
201 FOREST PRESERVE		0.0925	790	319	358	319	8,283	6,483	5,003	4,331
301 COMM COLL 505		0.5411	4,621	1,864	2,092	1,864	48,453	37,925	29,265	25,334
314 SCHOOL DIST 169		2.6906	22,976	9,268	10,401	9,267	240,930	188,580	145,518	125,974
333 HIGH SCHOOL305C		2.0013	17,090	6,894	7,736	6,893	179,207	140,268	108,238	93,701
419 ST JOE STAN FIRE		0.2940	2,511	1,013	1,136	1,013	26,326	20,606	15,901	13,765
761 ST JOSEPH TWP		0.2820	2,408	971	1,090	971	25,252	19,765	15,252	13,203
762 ST JOE RD & BR		0.1564	1,336	539	605	539	14,005	10,962	8,459	7,323
763 ST JOE PERM ROAD		0.1537	1,313	529	594	529	13,763	10,773	8,313	7,196
Total at Aggregate Rate (All Taxing Bodies)		**7.0597**	**60,287**	**24,319**	**27,290**	**24,314**	**632,162**	**494,803**	**381,815**	**330,535**

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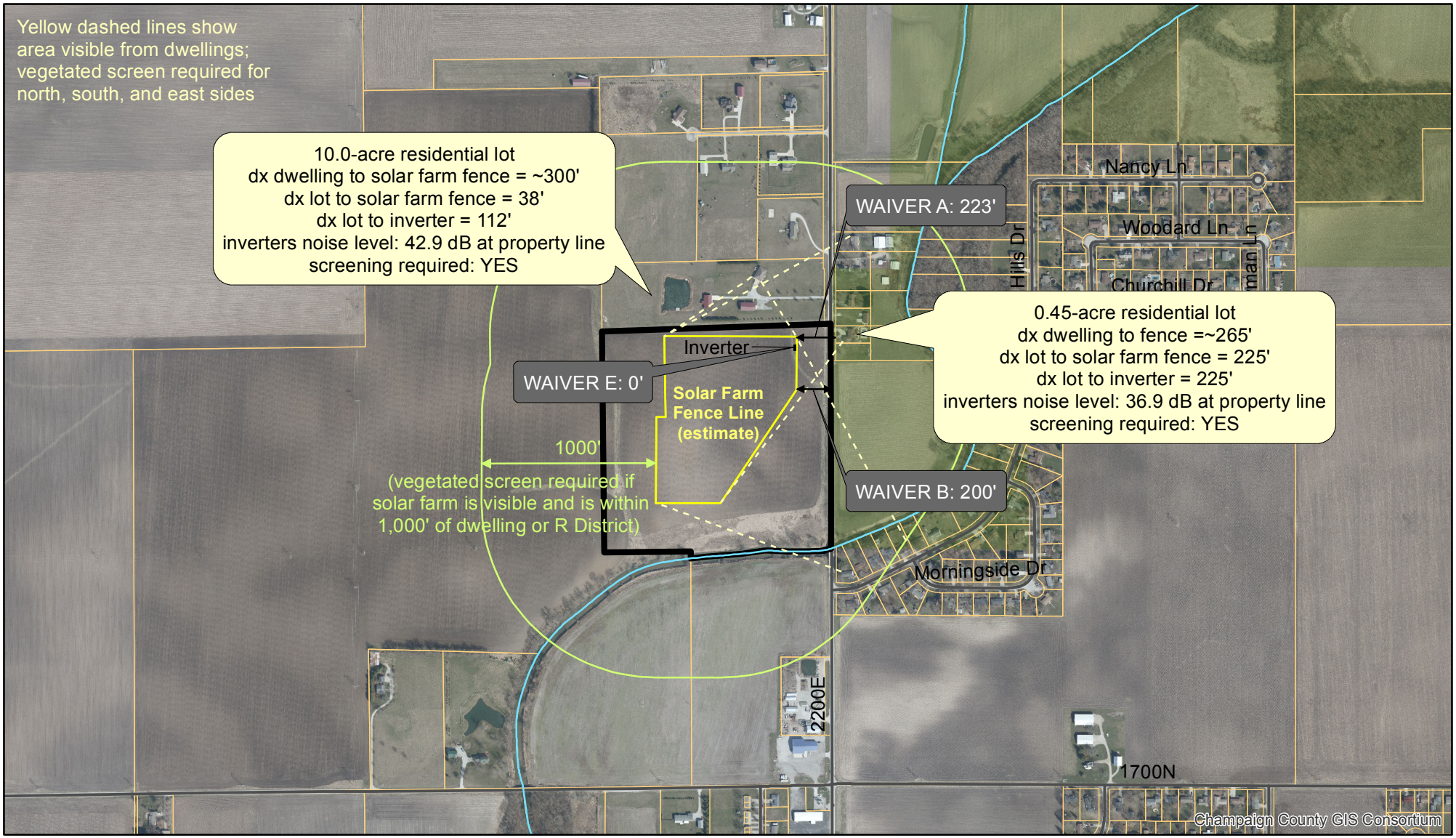
Annotated Aerial: Separation Distances and Screening

Case 906-S-18
September 13, 2018

Revised 09/13/18



Legend

- Solar farm fenced area
- Fenced area 1000' buffer
- Subject Property
- CR Zoning District
- Parcels
- Streams
- Streets
- Railroad

0 200 400 800 Feet

N

Champaign County Department of PLANNING & ZONING

2. Decommissioning Activities

Introduction

The Decommission Plan (the "Plan") describes anticipated activities and process for decommissioning of the proposed facility following its useful life. The purpose of decommissioning is to restore the Property to a clean, safe and usable condition for continued use by the landowner.

Decommissioning consists of the removal of above-ground and below-ground facility components, management of excess materials and waste as well as the restoration of Project lands, as applicable. Activities are expected to take between 8-10 weeks but no longer than four-months.

Potential negative environmental effects from decommissioning of the facility will be mitigated through use of erosion and sediment control measures, limiting the use of heavy machinery (where possible), and maintaining a buffer from natural features. These control measures, as well as other mitigation measures used during construction will be re-implemented during the decommissioning phase and until the site is stabilized.

Future consultation will occur with the municipality prior to decommissioning to discuss preferences and commitments to restore the Project to its pre-construction condition or a similar state. All decommissioning and restoration activities will adhere to the requirements set forth by Occupational Health and Safety Administration (OSHA) and will be in accordance with all applicable federal, state and local permitting requirements. As with the construction phase, an onsite manager responsible for safety will be present on-site (generally the contractor's project manager) while decommissioning activities are taking place.

The decommissioning plan is based on current procedures and experience. These procedures may be subject to revision based on new experiences and requirements over time. At the time of decommissioning, various options and procedures will be re-evaluated to ensure that decommissioning is safe and beneficial to the environment.

Equipment Removal

A significant amount of the components of the Project will include recyclable or re-saleable components, including copper, aluminum, galvanized steel, and modules. Due to their resale monetary value, these components will be dismantled and disassembled rather than being demolished and disposed of.

Following coordination with the local utility company regarding timing and required procedures for disconnecting the Facility from the private utility, all electrical connections to the system will be disconnected and all connections will be tested locally to confirm that no electric current is running through them before proceeding. All electrical connections to the panels will be cut at the panel and then removed from their framework by cutting or dismantling the connections to the supports. Inverters, transformers, and switchgear will be lifted, secured onto flat beds, and transported off-site for processing.

Modules will be detached from the racking system and stacked for removal. However, in the event of a total fracture, the interior materials are silicon-based and may not be considered hazardous. Disposal of these materials at a landfill will be permissible.

The metal piling systems used to secure the PV system in the ground will be removed entirely and if full removal is not possible, then terminated at a depth greater than four-feet from grade or at bedrock whichever is shallower. The piling materials will be collected and recycled. Additionally, all associated metal mounting structures along with the metal perimeter fencing and gates will be removed and either reused or sent for recycling.

Grade slabs will be broken, removed, and disposed of off-site or recycled. Unless requested by the landowner for the access road to remain, materials from road construction will be removed, shipped off-site for either re-use or disposal. If necessary, the former road bed will be backfilled and graded with material native to the region to blend it with the immediately adjacent and existing topography.

Aboveground utility poles owned by the Project will be completely removed and disposed of off-site in accordance with utility best practices. Overhead wires will be removed from the area of the solar modules and terminated at the point of interconnection. Underground wiring at depths of less than four-feet will be removed and recycled.

Prior to final demobilization, a final walkthrough of the Project area and the Property is completed to police for and ensure all debris is collected and removed.

Site Restoration

Those areas disturbed during decommissioning activities will be graded as necessary to ensure a uniform slope for proper storm water management, prevent the ponding of waters and address any rutting or other depressions caused by removal equipment. The disturbed areas will then be seeded either by hand or via hydro seeding to reestablish vegetation compatible with the Property and region. It is anticipated that a seed mix native to the area will be used by the decommissioning contractor, unless the landowner instructs that they will begin using the property for agricultural purposes and will reestablish the area with agricultural vegetation.

3. Permitting

Permitting & Approvals

Prior to the initiation of decommissioning activities, local code will be reviewed for applicability with decommissioning activities. The municipality will be consulted to confirm and applications made for appropriate permits and approvals, if any. At a minimum, it is anticipated that a new storm water pollution prevention plan (SWPPP) will be required along with a building permit. It is assumed that neither a new or revised site plan or special use permit would be necessary because decommissioning activities are associated with the originally issued approvals.

Throughout the decommissioning process, the municipality will be provided with regular updates and notice upon completing the restoration activities.

Westwood

Estimated Decommissioning Costs
Including Dismantling/Removal Costs
and Salvage Value

Project Name: St. Joseph West Solar
Date: August 24, 20
WPS Project Number: 0015273.00
By: JTW

Project Size	4	MW-AC	2.88	MW-DC	
	Quantity	Unit	Unit Cost	Total Cost	Cost Per MW
Mobilization/Demobilization	1	Lump Sum	$20,000.00	$20,000	$10,000
Permitting					
State Permits	1	Lump Sum	$10,000.00	$10,000	N/A
Subtotal Permitting				$10,000	
Civil Infastructure					
Removal Gravel Surfacing from Road	216	Cubic Yards	$4.00	$862	$431
Haul Gravel Removed from Road	216	Cubic Yards	$6.00	$1,293	$647
Disposal of Gravel Removald from Road	216	Cubic Yards	$10.00	$2,156	$1,078
Grade Road Corridor	15,520	Square Feet	$0.25	$3,880	$1,940
Erosion and Sediment Control Along Road	150	Linear Feet	$2.00	$300	$150
Removal of Security Fence	3,000	Linear Feet	$6.00	$18,000	$9,000
Subtotal Civil Infastructure				$26,491	
Structural Infastructure					
Removal Tracker Array Steel Foundation Post Full Depth	2,020	Each	$13.00	$26,260	$13,130
Haul Tracker Array Steel Post	182	Ton	$6.75	$1,227	$614
Removal PCU Station Post to a 4' Depth	20	Each	$65.00	$1,300	$650
Haul PCU Station Post	20	Each	$3.00	$60	$30
Removal Array Racking	91	Ton	$200.00	$18,241	$9,120
Haul Array Racking	91	Ton	$6.75	$616	$308
Subtotal Structural Infastructure				$47,703	

Westwood

Estimated Decommissioning Costs -
Including Dismantling/Removal Costs
and Salvage Value

Electrical Collection/Transmission System					
Removal of PV Modules	8,484	Each	$10.00	$84,840	$42,420
Removal of Inverter Stations	16	Each	$60.00	$960	$480
Removal of Panelboards	2	Each	$40.00	$80	$40
Removal of PCU Station (Inverter/Transformer)	2	Each	$2,000.00	$4,000	$2,000
Removal of Riser Pole and Overhead Cable	1	Each	$1,000.00	$1,000	$500
Removal of SCADA Equipment	1	Each	$1,000.00	$1,000	$500
Removal of Underground Collector System Cables	2,160	Linear Feet	$5.00	$10,800	$5,400
Removal of DC System Cables	30,300	Linear Feet	$1.00	$30,300	$15,150
Removal of Fiber Optic Cable	2	Per MW	$500.00	$1,000	$500
Subtotal Electrical Collection/Transmission System				**$133,980**	
Site Restoration					
Stabilized Construction Entrance	1	Each	$2,225.00	$2,225	$1,113
Perimeter Controls	0	Linear Feet	$2.00	$0	$0
Till to farmable condition on project area	13	Acres	$1,300.00	$16,939	$8,470
Subtotal Site Restoration				**$19,164**	
Subtotal Demolition/Removals				**$257,338**	
Salvage					
Fencing	3,000	Linear Feet	$0.00	$0	$0
Steel Posts	182	Tons	$260.00	$47,268	$23,634
Module Racking	91	Tons	$260.00	$23,713	$11,856
PV Modules	8,484	Each	$11.97	$101,537	$50,768
String Inverters	16	Each	$3.69	$59	$30
Inverter/Transformer	2	Each	$123.69	$247	$124
Scada Equipment	1	Each	$0.00	$0	$0
Collection Lines (DC Copper)	8,640	Pounds	$1.82	$15,725	$7,862
Subtotal Slavage				**$188,549**	
Total Demolition Minus Salvage				**$68,790**	

Proposed Decommissioning Costs for Various Solar Farms Including Proposed Costs for Current Solar Farm Zoning Cases September 13, 2018

	Solar Farm or Source	Project Location	MW	Ac.s (1)	Total Decom. Cost (2)	Salvage Value (2)	Net Decom. Cost (2) (3)	Total Cost per MW	Net Cost per MW	Total Cost / Acre	Net Cost / Acre
1	NYSERDA (2016)	MA	2.0	12	60,200	NA		30,100		5,017	
2	NEXTERA Energy (2016?)	Belle Plaine, MN	5.0	30	122,864	142,200	-19,336	24,573	-3,867	4,095	-645
3	Fast Sun LLC (2017)	Goodhue Co., MN	1.0	6	134,267	104,732	29,535	134,267	29,535	22,378	4,923
4	South Forty Solar LLC (2015)	Burlington, VT	2.5	25	116,000	NA		46,400		4,640	
5	Tripple State Solar LLC (2015)	Iredell Co., NC	5.0	40	166,100	567,300	-401,200	33,220	-80,240	4,153	-10,030
6	Norman Dupuis, P.E. (2017)	Chester, NY	2.7	11	82,000	20,000	62,000	30,370	22,963	7,455	5,636
7	Muckdog Solar LLC (2017)	Genesee Co., NY	2.0	20	154,095	319,763	-165,668	77,048	-82,834	7,705	-8,283
8	Westlands Solar Farms (2011?)	Fresno, Co., CA	18.0	85	1,500,000	1,500,000	0	83,333	0	17,647	0
9	RE Kammerer Holdings (2011)*	Sacramento Co, CA	15.0	115	NA	NA	-89,494	NA	-5,966	NA	-778
10	Fleshman/Kost Road (2011)	Galt, CA	3.0	20	595,000	375,000	220,000	198,333	73,333	29,750	11,000
	AVERAGE		5.6	36.4	325,614.0	432,714	-364,163	73,071.6	-6,725	11,426.5	304
	AVERAGE w/o #8		4.2	31.0	178,815.8	254,833	-52,023	71,788.8	-6,725	10,649.0	260
	Case 894-S-17	St. Joseph Twp IL	2.0	16	40,976	42,456	-1,480	20,488	-740	2,561	93
	Case 897-S-18	Ludlow Twp IL	2.0	16	40,976	42,456	-1,480	20,488	-740	2,561	93
	Case 903-S-18	Sidney Twp IL	4.0	DECOMMISSIONING COSTS WERE NOT INCLUDED FOR 4 MW							
	Case 906-S-18	St. Joseph Twp IL	2.0	14	257,338	188,549	68,789	128,669	34,395	17,747	4,744
	Case 907-S-28	St. Joseph Twp IL	4.0	DECOMMISSIONING COSTS WERE NOT INCLUDED FOR 4 MW							

NOTES

1. If not stated estimated at 6 acres per MW
2. Costs reported for the year indicated.
3. Total Decommissioning Cost less Salvage Value
4. Type of racking is not clear in many instances. #3,#9 are single axis tracker arrays. #10 is a fixed tilt array

* RE Kammerer cost does not include $1,253,683 for estimated salvage value of photovoltaic panels which decreases net cost to -$1,466,869

(References on back)

References:

1 https://www.nyserda.ny.gov/-/media/NYSun/.../Decommissioning-Solar-Systems.pdf
2 http://www.belleplainemn.com/sites/default/files/images/Attachment_2_Devine-Johnson_IUP_Application_Submittal.pdf
3 https://www.co.goodhue.mn.us/AgendaCenter/ViewFile/Item/5355?fileID=13029
4 https://www.burlingtonvt.gov/sites/default/files/Agendas/SupportingDocuments/SFS-LS-9%20Decommissioning%20Plan%20with%20Attachments.pdf
5 https://www.co.iredell.nc.us/AgendaCenter/ViewFile/Item/194?fileID=2559
6 http://www.cit-e.net/chester_ny/uppages/CLEAN%20ENERGY%20DECOMMISSIONING%20PLAN%2010-4-07.PDF
7 http://co.genesee.ny.us/docs/planning/T_06_BAT_4_17.pdf
8 https://www.google.com/search?q=solar+farm+decommissioning+costs&ei=Aiy9WuilMo2ZzwLP9pvwCA&start=160&sa=N&biw=1103&bih=712
9 www.planningdocuments.saccounty.net/DocOpen.aspx?PDCID=13128
10 www.planningdocuments.saccounty.net/DocOpen.aspx?PDCID=13854

Prepared For:

Sunrise

APRIL 10, 2017

DECOMMISSIONING PLAN - SINGLE AXIS TRACKER ARRAY

RADIANT ENERGY GROUP

RADIANT ENERGY GROUP
5630 Turkey Oak Dr. Charlotte, NC 28227

Contents

OPENING STATEMENT

The community solar garden consists of numerous recyclable materials, including glass, semiconductor material, steel, aluminum, copper, and plastics. When the project reaches the end of its operational life, which is expected to be 25 (twenty five) years from date of PTO (Permission To Operate) from interconnecting Utility and local permitting government but could be in excess of 40 (forty) or more years, the component parts will be dismantled and recycled as described below. That time period will be established by the local permitting government in its permit. In addition, the decommissioning can also take place after twelve (12) months of non-operation, as required by the site lease and the local government.

At the time of decommissioning, the project components will be dismantled and removed by use of minimal ground surface impact construction equipment, and materials will be safely recycled and or disposed of in accordance with requirements. Specific opportunities for reuse or recycling (e.g., panels) will be considered to the maximum amount practicable. Where such options are not viable, components will be decommissioned and disposed of at an appropriately licensed facility.

As laid out below, the security fence and equipment will be dismantled, stored on site and then transported to the appropriate locations. All access roads will be removed and grading will be returned to as close to its original state (unless determined otherwise by the landowner and/or local government). Based on our preliminary designs, we expect that the solar gardens will be installed with minimal, if any, grading required. Hence any restoration activities at the time of decommissioning will likewise require minimal re-grading.

GENERAL DECOMMISSIONING SCOPE

The project owner will be responsible for all the decommissioning costs. The general scope of such decommissioning will be:

1) Obtain any permits required for the decommissioning, removal and legal disposal prior to commencement of decommissioning activities
2) Remove and disposal of all equipment components
3) Remove all hazardous materials (if any) and transport them to be disposed of by licensed contractors at the appropriate facility, in accordance with rules and regulations.
4) If appropriate, re-grade, and revegetate in accordance with lease, permits and in compliance with all applicable rules and regulations
5) To the best extent possible, preserve and reclaim the soils on the project site to a level of pre-project quality
6) Reclaim soils in access driveway and equipment pad areas by removing imported aggregate material and concrete foundations and replaced with soils as needed
7) Remove electrical conduits and backfill trenches with the native soils removed
8) Reseed as much disturbed areas using a seed mix pre-approved by the local permitting government

SEQUENCE OF WORK

The sequence for decommissioning of the project generally occurs in the reverse order of the installation:

1) The solar system will be disconnected from the power grid.
2) PV modules will be disconnected, unattached, collected, and removed.

3) Site aboveground and underground electrical interconnection and distribution cables will be removed and recycled off-site by an approved recycler.
4) PV module support racking will be removed and resold or recycled off-site by an approved recycler.
5) PV module support steel and support posts will be removed and recycled off-site by an approved recycler.
6) Electrical devices, including transformers, and inverters, will be removed and recycled off-site by an approved recycler.
7) Concrete pads will be removed and recycled off-site by an approved recycler.
8) Fencing will be removed and recycled by an approved recycler.

The project site may be converted to other uses in accordance with applicable land use regulations at the time of decommissioning. There are no permanent changes to the site, and it can be restored to its original condition. This is one of the many great advantages about solar gardens. If desired, the site can return to productive farmland after the system is removed.

TEMPORARY EROSION CONTROL

During the decommissioning of the project, Decommissioning Contractor will use if necessary, appropriate temporary (construction-related) and sedimentation control best management practices as described in the project Storm-water Pollution Prevention Plan (SWPPP).

SYSTEM REMOVAL COSTS

The breakdown of costs for removal of the Community Solar Garden is found in TABLE 1 below. The costs are based upon typical quantities for a 1mwAC/1.35mwDC Fixed Tilt array. Costs may slightly vary depending on site specific quantities at time of construction.

TABLE 1 (Decommissioning Costs)

	Quantity	Unit	Unit Cost	Total Cost
Mobilization/Demobilization				
Mobilization/Demobilization	1	Lump Sum	$10,000.00	$10,000.00
Subtotal Mob/Demob				**$10,000.00**
Permitting				
State Permits	1	Lump Sum	$1,200.00	$1,200.00
Subtotal Permitting				**$1,200.00**
Civil Infrastructure				
Removal Gravel Surfacing from Road	325	CY	$5.80	$1,885
Haul Gravel Removed from Road	325	CY	$6.84	$2,223
Disposal of Gravel Removal from Road	325	CY	$0.00	$0
Removal Geotextile Fabric from Road Area	16,000	SF	$0.10	$1,600
Culvert Removal and Disposal	0	Each	$1,200	$0.00
De-Compact and Grade Road Corridor	1,000	LF	$1.00	$1,000.00
Topsoil and Stabilization on Removed Road Area	0.45	Acres	$17,000.00	$7,650.00
Removal of Security Fence	2,500	LF	$6.50	$16,250.00
Subtotal Civil Infrastructure				**$30,608**

Structural Infrastructure				
Remove PV Rack Steel Posts to a 4' Depth	575	Each	$13.00	$7,475
Haul PV Rack Array Steel Post	31	Ton	$6.75	$209
Removal Transformer Station Post to a 4' Depth	10	Each	$13.00	$130
Haul Transformer Station Post	0.4	Ton	$6.75	$3
Removal Array Tracker & Motors	120	Each	$110.00	$13,200
Haul Array Tracker & Motors	90	Ton	$6.75	$608
Remove, Load, Haul Concrete Electrical Pads	30	CY	$150.00	$4,500
Subtotal Structural Infrastructure				**$26,124**
Electrical Collection/Transmission System				
Removal of PV Modules	4,032	Each	$10.00	$40,320
Haul PV Modules	80	Ton	$6.75	$540
Remove and Load Inverters	2	Each	$300.00	$600
Haul Inverters	2	Ton	$135.00	$270
Removal Loading and Freight of Transformers	1	Each	$400.00	$400
Removal, Loading and Freight of Electrical Equipment	1	Each	$500.00	$500
Removal and Disposal of SCADA Equipment	1	Each	$300.00	$300
Removal and Load Underground Collector System Cables	10,000	LF	$0.07	$700
Haul Underground Cable	3	Ton	$135.00	$405
Subtotal Electrical Collection/Transmission System				**$44,035**
Site Restoration				
Perimeter Controls	2,000	LF	$4.00	$8,000
Topsoil and Turf Establishment on area within Removed Array	11	Acres	$1,300.00	$14,300
Subtotal Site Restoration				**$22,300**
Grand Total: Decommissioning & Site Restoration				**$134,267**

SALVAGE VALUE

Solar power systems retain some of their value after their operating life. The solar modules are known to continue to have useful life and in turn can be resold or recycled due to the metallurgic properties. Additionally, the community solar garden has large usage of steel piers, aluminum railing, copper and aluminum conductors and various other materials that have salvage value.

The breakdown of the salvage values are found in TABLE 2 below. The salvage values are based on typical quantities for a **1mwAC** / 1.35mwDC Single Axis Tracker array. Values may slightly vary depending on site specific quantities at time of construction.

TABLE 2 (Salvage Value)

	Quantity	Unit	Unit Cost	Total Cost
Salvage				
Fencing	6.25	Tons	$50.00	$313
Steel Posts	31	Tons	$175.00	$5,425
Module Trackers and Motors	90	Tons	$175.00	$15,750
PV Modules	4,032	Each	$20.00	$80,640
Transformers	1	Each	$2,500.00	$2,500
Switch Gear, Capacitors, Fuses, Etc.	1	Each	$0.00	$0
Collection Lines	5,200	Pounds	$0.02	$104
Subtotal Salvage				**$104,732**
Total Demolition Minus Salvage Value				**29,536**

NET COSTS FOR DECOMMISSIONING

The estimated cost, salvage value, and net costs of decommissioning the project are below.

Demo & Restoration Cost	**$ 134,267**
Salvage Value	**(104,732)**
Total Net Cost	**$ 29,536**

DECOMMISSIONING FUND

1) Defined conditions upon which decommissioning will be initiated:

A solar farm/garden that ceases to produce energy on a continuous basis for 12 (twelve) months shall be considered abandoned and the project owner shall be required to decommission the facility and restore the site to substantially its prior condition nless substantial evidence is presented to the local permitting government of the intent to maintain and reinstate the operation of the facility. A shorter period of time to decommission and restore the site may be specified by the local government in its permit.

Decommissioning must commence within 60 days of the expiration or termination of the GIA (Generator Interconnection Agreement) or upon termination of the IUP (Interim Use Permit).

2) The anticipated manner in which the solar farm project will be decommissioned and site restored.

The manner in which the solar farm will be decommissioned is found in aforementioned in this document.

3) Timetable for completion of decommissioning:

The decommissioning will be completed within the time frame stated in the Conditional or Interim Use Permit. We recommend 6 months.

4) The party responsible for decommissioning:

The permittee or its assignee shall be responsible for the decommissioning. In the event the property owner and/or responsible party fail to timely decommission the solar farm/garden facility as required above, the Local permitting government shall be entitled to take all measures allowed by the Minnesota State Statutes, as well as

the right to levy penalties as provided in the Local permitting government Code, the right to obtain a permanent injunction ordering the removal of such solar farm/garden facility, and the right to obtain a court order permitting the Local permitting government to remove such solar farm/garden facility.

5) Financial Assurance:

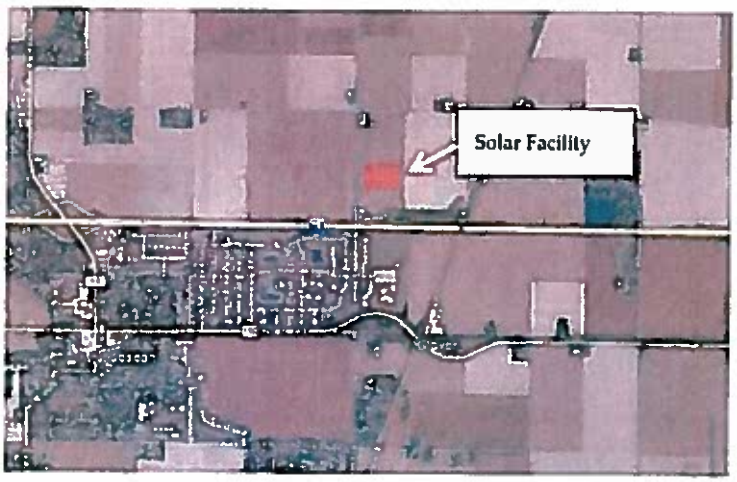
The local permitting government may require assurance that funds will be there for the necessary decommissioning work when the project reaches the end of its purposeful life, been condemned, or has been abandoned. A "financial assurance level" of 20% of total project decommissioning costs can be established by year 10 with increases over time until it reaches 100% for year 25 of operation. Assurance can be achieved via Letter of Credit or cash set aside in an escrow account controlled by a third-party insurance company. The financial assurance is recommended to be in the amount of; **$30,000.00 per net costs after salvage value of equipment and costs for decommissioning.**

Upon successful decommissioning, the local permitting government is expected to release the escrow/letter of credit within 30 days of a request. Partial release(s) commensurate with the decommissioning completed as of the date of the request is requested.

DECOMMISSIONING PLAN

ST. JOSEPH SOLAR FARM

CHAMPAIGN COUNTY, ILLINOIS



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AUG 13 2018
CHAMPAIGN CO. P & Z DEPARTMENT

Prepared By:

Community
POWER GROUP

August 2018

1. EXECUTIVE SUMMARY

The St. Joseph Solar Farm is proposed to be a 2 Megawatt (MW) solar energy conversion system located on 57 acres on County Road 2350E between County Road 1700N and I-74 in Champaign County, Illinois. The facility will use solar photovoltaic technology and a single axis tracking racking system. The project will cover approximately 13 acres as noted in the attached site plan. As noted in this report the salvage value of the raw materials of $42,456 will exceed the estimated cost of decommissioning the system of $40,976. These amounts do not include the value of the solar panels (which have an 80% production guarantee at 25 years) or the other electric equipment. If counted, the value of the panels and electrical equipment would result in a salvage value that would far exceed the cost of removing the facility. However, to provide the land owner with additional surety beyond the salvage value, the Community Power Group is providing the landowner a corporate guarantee for the removal of the facility and that corporate guarantee will survive or be transferred in a sale of the asset or in bankruptcy. Petitioner will provide a financial surety of $1,000/acre in addition to the salvage value described below. The Petitioner expects to record a covenant incorporating the provisions of this decommissioning plan on the deed subject to the lot as a condition of special use permit approval.

2. SITE DESCRIPTION

The St. Joseph Solar Farm is proposed to be a 2 Megawatt (MW) solar energy conversion system located on 57 acres on County Road 2350E between County Road 1700N and I-74 in Champaign County, Illinois. See Appendix A for site plan. The proposed Solar Farm will consist of the following primary components:

SITE COMPONENTS			
ITEM	ENTIRE SITE	PER MW	UNIT
Structural Steel	169.77	84.89	Tons
Copper Wiring	1.84	0.92	Tons
Aluminum Frame & Wiring	8.34	4.17	Tons
Concrete Foundations / slabs	17.55	8.77	Cubic Yards
Solar Panel Modules	7,371	3,685	Each

a. Decommissioning Sequence

In the event the St. Joseph Solar Energy Project requires decommissioning, the following sequence for removal of the components will be used:

- Remove Solar Panel Modules
- Remove Structural Steel Framing
- Remove Concrete Foundations/ Slabs
- Remove Above and Below Ground Cable
- Reclaim Site to Pre-Construction Condition

3. SOLAR PANELS AND RACKING

a. Solar Panel Technical Data

The St. Joseph Solar Energy Project will have a system capacity of 2 Megawatts (MW) and will use a single axis tracker system. There will be 7,776 panels, with 94 rows each with 81 panels; 3 rows each with 54. There will be 1,365 steel driven post holding the racking.

b. Solar Panel Decommissioning

Assuming the steel framing, copper and aluminum wiring are salvageable and using current salvage values as of the date of this report, the salvage value for the solar farm is estimated as follows:

SALVAGE VALUE OF MATERIALS ESTIMATE		
Structural Steel Framing – 84.89 TONS / MW	$175 / TON	$14,855
Coated Copper Wiring (COATED) – 0.92 TONS / MW	$3,300/ TON	$3,040
Aluminum Framing & Wiring – 4.17 TONS / MW	$800 / TON	$3,334
Panels and Inverters		
Per Megawatt Basis	TOTALS	$21,229
Total Estimate for 2MW	TOTALS	$42,459

The solar panels would be salvageable for reuse or resale on other solar energy projects; the panels have a warranty to still be able to generate electricity at 80% of their original capacity after 25 years. The panels will be collected, hauled to a storage yard and assessed for value at the time of decommissioning. Inverters, transformers, and the switchgear will also retain value for reuse on other power generating projects and will be hauled to a storage facility for assessed value, functionality and potential reuse. For the purposes of this report, it has been conservatively estimated that the value of these components surpasses the cost of the disassembling and hauling processes.

Disassembly costs include all equipment, labor, and materials involved with taking apart the solar panel modules, and framing. Hauling costs assume a 10-mile radius hauling, and 15 Racks per load (45 Racks per MW). It is assumed that it will take 2 operators and 2 laborers to disassemble racks. Estimates per MW for disassembling racks and hauling salvageable materials and modules off site are as follows:

DISASSEMBLY COSTS OF SOLAR PANELS COST ESTIMATE		
Disassembly Framing Racks & Modules – 45 RACKS / MW	$150 / HR	$13,500
Hauling Structural Steel Framing Offsite – 45 RACKS / MW	$75 / HR	$3,375
Hauling Coated Copper Wiring (Coated) Offsite – .092 TONS / MW	$75 / HR	$600
Hauling Aluminum Framing & Wiring – 4.17 TONS / MW	$75 / HR	$600
Per Megawatt Basis	TOTALS	$18,075
Total Estimate for 2 MW	TOTALS	$36,150

c. Site Foundations & Slabs

Each concrete foundation will have to be completely removed and hauled off site to an approved fill site. The foundation can be removed by a jackhammer mounted on either a skid loader or excavator.

There is essentially no salvage value to the site's foundations and slabs. The foundation designs for the site consist of 1 Equipment Pad inverter slabs (10' x 8' x 2') amounting to 9 C.Y. of concrete. The removal and disposal of the foundations and slabs are estimated as follows:

CONCRETE FOUNDATION & SLAB REMOVAL COST ESTIMATE		
Mobilization, Excavation, & Removal	$500 / DAY	$500
Approved Site for Concrete Fill – Assume $10 / C.Y.	9 C.Y.	$90
Per Site Basis	TOTALS	$590

4. AGGREGATE ACCESS ROADS AND PADS

a. Description

The site decommissioning will involve the removal and transportation of the aggregate materials from the site to a nearby site where the aggregate can be placed as fill, or processed for salvage. It is possible that the local townships may accept this material without processing to use on their local roads; however, for the purpose of this report it is assumed that the materials will be removed and hauled to a fill/reprocessing site within 10 miles of the solar site. Permanent site roadways will be constructed in such a manner that topsoil will be bladed back from the roadway areas and blended into normal site grading; therefore no topsoil will need to be hauled in during decommissioning of the site. There are approximately 233,820 square yards of permanent access roads. Foundation/Pad construction will be performed in a similar manner. Costs for this are discussed above.

b. Aggregate Access Road Decommissioning

The total length of the site access roads is 534 linear feet by 12 feet wide. The average excavation depth of the roadways will be 12" of CA-6 aggregate materials and aggregate soil mixed materials. Using the designed roadway lengths, widths and depths, 213 cubic yards of material will need to excavated and hauled away. Based on the current prices for excavation and hauling of materials the following unit prices are used to estimate the access road decommissioning costs:

REMOVAL OF ACCESS ROADS COST ESTIMATE		
Mobilization and Aggregate / Earth Excavation – 213C.Y.	$11.50 / C.Y.	$2,456
Re grading of Roadway Areas – 712 S.Y.	$2.50 / S.Y.	$1,780
Per Site Basis	TOTALS	$4,236

5. CABLES

a. Cable Wire and Trench Installation

This project will have cable both above ground and placed in below the ground surface. In all cable locations outside the access roads, the trenches are backfilled with on site earthen materials with at least 6 inches of topsoil. At roads, the cables will be in conduits and back filled to prevent rutting.

b. Cable Wire and Trench Decommissioning

All cables placed on this site will be salvaged. Below ground cables will be pulled and conduits will be removed during the decommissioning of this project. The cost for pulling cables is included with the disassembling of racks and panels cost per megawatt as noted above.

c. Earthwork and Topsoil Restoration

Once all the above ground improvements are removed, the remaining work to complete the decommissioning of the St. Joseph Solar Energy Project will consist of shaping and grading of the areas to as near as practicable ensure proper drainage of the project area. The initial site grading performed during

the construction of the solar farm is design to be done in such a manner as to limit mass earth moving and only include efforts to ensure positive drainage of the site. This initial effort of maintaining much of the site original topography will allow for very limited grading to be required during decommissioning. It is expected that only the roadway areas, switch yard, and warehouse building area will require regarding and restoration.

The access roads are designed to simply move the topsoil to the side of the roads and be used as fill. This topsoil can easily be re graded back to create a usable condition and ensure proper drainage. Estimates of cost for this re grading were included in the aggregate access roads areas.

6. SUMMARY OF DECOMMISSIONING COSTS

The following is a summary of the total costs for the decommissioning of the St. Joseph Solar Farm. The table indicates the salvageable elements of this site are of greater value that the cost of restoring the property to its use for farming purposes. It is felt this estimate is conservative due to the value of the panels and other electrical components not being included. The total decommissioning costs of the St. Joseph Solar Farm can completely be recovered from salvageable materials on site.

TOTAL COST ESTIMATE		
DESCRIPTION	DEBIT	COST
SOLAR EQUIPMENT RECYCLING & SALVAGING $57,475 x 2 MW	$42,456	
DISASSEMBLING & HAULING SOLAR EQUIPMENT $47,775 x 2 MW		$36,150
SITE CONCRETE FOUNDATIONS & SLABS		$590
AGGREGATE ACCESS ROADS & PADS REMOVAL		$4,236
TOTALS	$42,456	$40,976
NET	$1,480	

Champaign County
Department of
PLANNING &
ZONING

Brookens Administrative
Center
1776 E. Washington
Street
Urbana, Illinois 61802

(217) 384-3708
zoningdept@co.champa
ign.il.us
www.co.champaign.il.u
s/zoning

CASE NO. 894-S-17 & 894-S-18

SUPPLEMENTAL MEMORANDUM #2
August 30, 2018

Petitioners: **Community Power Group LLC, via agent Michael Borkowski, Owner of Community Power Group, and participating landowners Erin Huls and Chris Soppet**

Request: **Authorize a Community PV Solar Farm with a total nameplate capacity of 2 megawatts (MW), including access roads and wiring, in the AG-1 Agriculture Zoning District, and including the following waivers of standard conditions:**
Note: underlined or strikethrough text is new since the advertised legal notice

Part A: A waiver for a distance of ~~725~~ 465 feet in lieu of one-half mile (2,640 feet) between a municipal boundary and a PV SOLAR FARM, per Section 6.1.5 B.(2) of the Zoning Ordinance.

Part B: A waiver for a separation distance of 250 feet in lieu of 275 feet between a PV SOLAR FARM electrical inverter and the PV SOLAR FARM perimeter fence, per Section 6.1.5 D.(6) of the Zoning Ordinance.

Part C: A waiver for a 24 feet wide area for all necessary access lanes or driveways and any required new PRIVATE ACCESSWAYS in lieu of the minimum required 40 feet, per Section 6.1.5 B.(1)b. of the Zoning Ordinance.

Other waivers may be necessary.

Location: **A 57.84-acre tract in the West Half of the Northeast Quarter of Section 12 of Township 19 North, Range 10 East of the Third Principal Meridian in St. Joseph Township, and commonly known as the property just north of the St. Joseph's Sportsman Club.**

Site Area: **PV Solar Farm Special Use Permit Area is about 15.56 acres**

Time Schedule for Development: **As soon as possible**

Prepared by: **Susan Burgstrom**
Senior Planner

John Hall
Zoning Administrator

Attachment A is an analysis of proposed decommissioning costs for 9 proposed PV solar farms at various locations around the country plus an example decommissioning cost from New York State. Copies of the decommissioning cost estimates will be posted on the Champaign County website. The proposed decommissioning costs for Cases 894-S-17 and 897-S-18 are also included in Attachment A for comparison.

Note the following regarding the various locations around the country:

1. Costs are reported from various years and have not been standardized to current costs.

2. Critical data regarding the type of racking system being decommissioned is missing in most instances and is only known for Fast Sun LLC and RE Kammerer Holdings (both of which are single axis tracker arrays); Fleshman/Kost Road (a fixed tilt array). The proposed Champaign County solar farms both use the single axis tracker array.

3. Other critical data regarding site specific considerations such as local cost considerations, remoteness of site, and physical considerations related to site restoration are missing.

PROPOSED DECOMMISSIONING COSTS FOR CASES 894-S-17 & 897-S-18

Neither Case 894-S-17 nor 897-S-18 includes any of the following in the proposed decommissioning costs:

- Construction mobilization
- Contingency
- Storm Water Pollution Prevention Plan
- Permits or fees (an ILR10 Stormwater Permit will be required)
- Removal of fencing
- Removal of vegetative screen. This is necessary to return to an agricultural use.
- Reseeding. This may not be necessary since these sites are assumed to be returned to agricultural use.

The Total Cost Estimate on page 5 of each proposal is confusing when in the top two lines of the table it gives costs under the column "DESCRIPTION" that are different than the costs in the columns "DEBIT" and "COST"on the top two lines and needs to be clarified.

COMPARING THE PROPOSED DECOMMISSIONING COSTS TO OTHER LOCATIONS

The comparison to other locations yields the following results:

1. The proposed decommissioning costs for Cases 894-S-17 and 897-S-18 are most similar to the proposed decommissioning costs for NYSERDA; NEXTERA Energy; South Forty Solar; and Norman Dupuis/ Chester NY, even though there are large differences between the proposed Champaign County costs and all other costs except for the NEXTERA Energy costs in Belle Plaine, Minnesota. See the attachments.

   Overall, the proposed decommissioning costs for Cases 894-S-17 and 897-S-18 are 20% to 50% lower than any similar costs included in this review. Underestimation of decommissioning costs will lead to an insufficient Letter of Credit for actual decommissioning.

2. Salvage value is not included with the NYSERDA and South Forty Solar proposed costs but are included with the costs for NEXTERA and Norman Dupuis/ Chester NY. The proposed Champaign County salvage costs per megawatt (proposed to be $21,228) are much greater than those for Norman Dupuis/ Chester NY ($7,407) but only about 75% of those for NEXTERA ($28,440). Overestimation of salvage value will also lead to an insufficient Letter of Credit for actual decommissioning.

3. Salvage values for PV panels are difficult to estimate and for that reason are not included in some estimates. For Champaign County zoning cases it would make sense to include salvage

values for PV panels provided that there is serious effort made to report a realistic salvage value at each financial assurance update. That way as the financial assurance is updated over time the estimate of salvage value can incorporate advances that may be made in salvaging and recycling of PV panels.

4. A special condition has been proposed to require a decommissioning cost estimate by an Illinois Professional Engineer prior to authorization of a Zoning Use Permit.

ATTACHMENTS

A **Solar Farm Decommissioning Costs from Various Solar Farms Including Proposed Costs for Cases 894-S-17 and 897-S-18**

B **Fact Sheet DECOMMISSIONING SOLAR PANEL SYSTEMS (NYSERDA)**

C **Exhibit F: Decommissioning Plan for Devine-Johnson Solar Project (NEXTERA)**

D **Proposed Decommissioning Cost Estimate for South Forty Solar Farm**

E **Removal Cost Estimate for Proposed 2.7 MW Solar Farm in Chester NY by Norman Dupuis**

Proposed Decommissioning Costs for Various Solar Farms Including Proposed Costs for Cases 894-S-17 and 897-S-18

August 20, 2018

	Solar Farm or Source	Project Location	MW	Ac.s (1)	Total Decom. Cost (2)	Salvage Value (2)	Net Decom. Cost (2) (3)	Total Cost per MW	Net Cost per MW	Total Cost / Acre	Net Cost / Acre
1	NYSERDA (2016)	MA	2.0	12	60,200	NA		30,100		5,017	
2	NEXTERA Energy (2016?)	Belle Plaine, MN	5.0	30	122,864	142,200	-19,336	24,573	-3,867	4,095	-645
3	Fast Sun LLC (2017)	Goodhue Co., MN	1.0	6	134,267	104,732	29,535	134,267	29,535	22,378	4,923
4	South Forty Solar LLC (2015)	Burlington, VT	2.5	25	116,000	NA		46,400		4,640	
5	Tripple State Solar LLC (2015)	Iredell Co., NC	5.0	40	166,100	567,300	-401,200	33,220	-80,240	4,153	-10,030
6	Norman Dupuis, P.E. (2017)	Chester, NY	2.7	11	82,000	20,000	62,000	30,370	22,963	7,455	5,636
7	Muckdog Solar LLC (2017)	Genesee Co., NY	2.0	20	154,095	319,763	-165,668	77,048	-82,834	7,705	-8,283
8	Westlands Solar Farms (2011?)	Fresno, Co., CA	18.0	85	1,500,000	1,500,000	0	83,333	0	17,647	0
9	RE Kammerer Holdings (2011)*	Sacramento Co, CA	15.0	115	NA	NA	-89,494	NA	-5,966	NA	-778
10	Fleshman/Kost Road (2011)	Galt, CA	3.0	20	595,000	375,000	220,000	198,333	73,333	29,750	11,000
	AVERAGE		5.6	36.4	325,614.0	432,714	-364,163	73,071.6	-6,725	11,426.5	304
	AVERAGE w/o #8		4.2	31.0	178,815.8	254,833	-52,023	71,788.8	-6,725	10,649.0	260
	Case 894-S-17	St. Joseph Twp IL	2.0	16	40,976	42,456	-1,480	20,488	-740	2,561	93
	Case 897-S-18	Ludlow Twp IL	2.0	16	40,976	42,456	-1,480	20,488	-740	2,561	93

NOTES

1. If not stated estimated at 6 acres per MW
2. Costs reported for the year indicated.
3. Total Decommissioning Cost less Salvage Value
4. Type of racking is not clear in many instances. #3,#9 are single axis tracker arrays. #10 is a fixed tilt array

* RE Kammerer cost does not include $1,253,683 for estimated salvage value of photovoltaic panels which decreases net cost to -$1,466,869

References:

1 https://www.nyserda.ny.gov/-/media/NYSun/.../Decommissioning-Solar-Systems.pdf
2 http://www.belleplainemn.com/sites/default/files/images/Attachment_2_Devine-Johnson_IUP_Application_Submittal.pdf
3 https://www.co.goodhue.mn.us/AgendaCenter/ViewFile/Item/5355?fileID=13029
4 https://www.burlingtonvt.gov/sites/default/files/Agendas/SupportingDocuments/SFS-LS-9%20Decommissioning%20Plan%20with%20Attachments.pdf
5 https://www.co.iredell.nc.us/AgendaCenter/ViewFile/Item/194?fileID=2559
6 http://www.cit-e.net/chester_ny/uppages/CLEAN%20ENERGY%20DECOMMISSIONING%20PLAN%2010-4-07.PDF
7 http://co.genesee.ny.us/docs/planning/T_06_BAT_4_17.pdf
8 https://www.google.com/search?q=solar+farm+decommissioning+costs&ei=Aiy9WuilMo2ZzwLP9pvwCA&start=160&sa=N&biw=1103&bih=712
9 www.planningdocuments.saccounty.net/DocOpen.aspx?PDCID=13128
10 www.planningdocuments.saccounty.net/DocOpen.aspx?PDCID=13854

FACT SHEET

DECOMMISSIONING SOLAR PANEL SYSTEMS

NEW YORK STATE OF OPPORTUNITY | NY-Sun

This fact sheet provides information to local governments and landowners on decommissioning of large-scale solar panel systems.

As local governments develop solar regulations and landowners negotiate land leases, it is important to understand the options for decommissioning solar panel systems and restoring project sites to their original status.

From a land use perspective, solar panel systems are generally considered large-scale when they constitute the primary use of the land, and can range from less than one acre in urban areas to 10 or more acres in rural areas. Depending on where they are sited, large-scale solar projects can have habitat, farmland, and aesthetic impacts. As a result, large-scale systems must often adhere to specific development standards.

Abandonment and decommissioning defined

Abandonment occurs when a solar array is inactive for a certain period of time.

- Abandonment requires that solar panel systems be removed after a specified period of time if they are no longer in use. Local governments establish timeframes for the removal of abandoned systems based on aesthetics, system size and complexity, and location. For example, the Town of Geneva, NY, defines a solar panel system as abandoned if construction has not started within 18 months of site plan approval, or if the completed system has been nonoperational for more than one year.[1]
- Once a local government determines a solar panel system is abandoned, and has provided thirty (30) days prior written notice to the owner it can take enforcement actions, including imposing civil penalties/fines, and removing the system and imposing a lien on the property to recover associated costs.

Decommissioning is the process for removing an abandoned solar panel system and remediating the land.

- When describing requirements for decommissioning sites, it is possible to specifically require the removal of infrastructure, disposal of any components, and the stabilization and revegetation of the site.

[1] Town of Geneva, NY, CODE § 130-4(D)(5) (2016)

What is a decommissioning plan?

Local governments may require to have a plan in place to remove solar panel systems at the end of their lifecycle, which is typically 20-40 years. A decommissioning plan outlines required steps to remove the system, dispose of or recycle its components, and restore the land to its original state. Plans may also include an estimated cost schedule and a form of decommissioning security (see Table 1).

What is the estimated cost of decommissioning?

Given the potential costs of decommissioning and land reclamation, it is reasonable for landowners and local governments to proactively consider system removal guarantees. A licensed professional engineer, preferably with solar development experience, can estimate decommissioning costs, which vary across the United States. Decommissioning costs will vary depending upon project size, location, and complexity. Table 1 provides an estimate of potential decommissioning costs for a ground-mounted 2-MW solar panel system. Figures are based on estimates from the Massachusetts solar market. Decommissioning costs for a New York solar installation may differ. Some materials from solar installations may be recycled, reused, or even sold resulting in no costs or compensation. Consider allowing a periodic reevaluation of decommissioning costs during the project's lifetime by a licensed professional engineer, as costs could decrease and the required payment should be reduced accordingly.

Table 1: Sample list of decommisioning tasks and estimated costs

Tasks	Estimated Cost ($)
Remove Rack Wiring	$2,459
Remove Panels	$2,450
Dismantle Racks	$12,350
Remove Electrical Equipment	$1,850
Breakup and Remove Concrete Pads or Ballasts	$1,500
Remove Racks	$7,800
Remove Cable	$6,500
Remove Ground Screws and Power Poles	$13,850
Remove Fence	$4,950
Grading	$4,000
Seed Disturbed Areas	$250
Truck to Recycling Center	$2,250
Current Total	$80,200
Total After 20 Years (2.5% inflation rate)	$98,900

NEW YORK STATE OF OPPORTUNITY | NYSERDA

How can decommissioning be ensured?

Landowners and local governments can ensure appropriate decommissioning and reclamation by using financial and regulatory mechanisms. However, these mechanisms come with tradeoffs. Including decommissioning costs in the upfront price of solar projects increases overall project costs, which could discourage solar development. As a result, solar developers are sometimes hesitant to provide or require financial surety for decommissioning costs.

It is also important to note that many local governments choose to require a financial mechanism for decommissioning. Although similar to telecommunications installations, there is no specific authority to do so as part of a land use approval for solar projects (see Table 2). Therefore, a local government should consult their municipal attorney when evaluating financial mechanisms.

The various financial and regulatory mechanisms to decommission projects are detailed below.

Table 2: Relevant Provisions of General City, Town, and Village Laws Relating to Municipal Authority to Require Conditions, Waivers, and Financial Mechanisms

Site Plan Review	General City Law	Town Law	Village
Conditions	27-a (4)	274-a (4)	7-725-a (4)
Waivers	27-a (5)	274-a (5)	7-725-a (5)
Performance bond or other security	27-a (7)	274-a (7)	7-725-a (7)
Subdivision	**General City Law**	**Town Law**	**Village Law**
Waivers	33 (7)	277 (7)	7-730 (7)
Performance bond or other security	33 (8)	277 (9)	7-730 (9)
Special	**General City Law**	**Town Law**	**Village Law**
Conditions	27-b (4)	274-b (4)	7-725-b (4)
Waivers	27-b (5)	274-b (5)	7-725-b (5

Source. Referenced citations may be viewed using the NYS Laws of New York Online

Excerpts from these statutes are also contained within the "Guide to Planning and Zoning Laws of New York State," New York State Division of Local Governments Services. June 2011. www.dos.ny.gov/lg/publications/Guide_to_planning_and_zoning_laws.pdf

Financial mechanisms

Decommissioning Provisions in Land-Lease Agreements. If a decommission plan is required, public or private landowners should make sure a decommissioning clause is included in the land-lease agreement. This clause may depend on the decommissioning preferences of the landowner and the developer. The clause could require the solar project developer to remove all equipment and restore the land to its original condition after the end of the contract, or after generation drops below a certain level, or it could offer an option for the landowner to buy-out and continue to use the equipment to generate electricity. The decommissioning clause should also address abandonment and the possible failure of the developer to comply with the decommissioning plan. This clause could allow for the landowner to pay for removal of the system or pass the costs to the developer.

Decommissioning Trusts or Escrow Accounts. Solar developers can establish a cash account or trust fund for decommissioning purposes. The developer makes a series of payments during the project's lifecycle until the fund reaches the estimated cost of decommissioning. Landowners or third-party financial institutions can manage these accounts. Terms on individual payment amounts and frequency can be included in the land lease.

Removal or Surety Bonds. Solar developers can provide decommissioning security in the form of bonds to guarantee the availability of funds for system removal. The bond amount equals the decommissioning and reclamation costs for the entire system. The bond must remain valid until the decommissioning obligations have been met. Therefore, the bond must be renewed or replaced if necessary to account for any changes in the total decommissioning cost.

Letters of credit. A letter of credit is a document issued by a bank that assures landowners a payment up to a specified amount, given that certain conditions have been met. In the case that the project developer fails to remove the system, the landowner can claim the specified amount to cover decommissioning costs. A letter of credit should clearly state the conditions for payment, supporting documentation landowners must provide, and an expiration date. The document must be continuously renewed or replaced to remain effective until obligations under the decommissioning plan are met.[2]

Nonfinancial mechanisms

Local governments can establish nonfinancial decommissioning requirements as part of the law. Provisions for decommissioning large-scale solar panel systems are similar to those regulating telecommunications installations, such as cellular towers and antennas. The following options may be used separately or together.

- **Abandonment and Removal Clause.** Local governments can include in their zoning code an abandonment and removal clause for solar panel systems. These cases effectively become zoning enforcement matters where project owners can be mandated to remove the equipment via the imposition of civil penalties and fines, and/or by imposing a lien on the property to recover the associated costs. To be most effective, these regulations should be very specific about the length of time that constitutes abandonment. Establishing a timeframe for the removal of a solar panel system can be based on system aesthetics, size, location, and complexity. Local governments should include a high degree of specificity when defining "removal" to avoid ambiguity and potential conflicts

[2] See a letter of credit submitted to the Vermont Public Service Board by NextSun Energy, LLC http://psb.vermont.gov/sites/psb/files/docketsandprojects/Solar/Exhibit%20Petitioner%20JL-7%20(Revised%20326.14).pdf

- **Special Permit Application.** A local government may also mandate through its zoning code that a decommissioning plan be submitted by the solar developer as part of a site plan or special permit application. Having such a plan in place allows the local government, in cases of noncompliance, to place a lien on the property to pay for the costs of removal and remediation.
- **Temporary Variance/Special Permit Process.** As an alternative to requiring a financial mechanism as part of a land use approval, local governments could employ a temporary variance/special permit process (effectively a re-licensing system). Under this system, the locality would issue a special permit or variance for the facility for a term of 20 or more years; once expired (and if not renewed), the site would no longer be in compliance with local zoning, and the locality could then use their regular zoning enforcement authority to require the removal of the facility.

What are some examples of abandonment and decommissioning provisions?

The New York State Model Solar Energy Law provides model language for abandonment and decommissioning provisions **www.cuny.edu/about/resources/sustainability/reports/NYS_Model_Solar_Energy_LawToolkit_FINAL_final.pdf**

The following provide further examples that are intended to be illustrative and do not confer an endorsement of content:

- Town of Geneva, N.Y., § 130-4(D): **ecode360.com/28823382**
- Town of Olean, N.Y., § 10.25.5 **www.cityofolean.org/council/minutes/ccmin2015-04-14.pdf**

Is there a checklist for decommissioning plans?

The following items are often addressed in decommissioning plans requirements:[3]

- Defined conditions upon which decommissioning will be initiated (i.e., end of land lease, no operation for 12 months, prior written notice to facility owner, etc.).
- Removal of all nonutility owned equipment, conduit, structures, fencing, roads, and foundations.
- Restoration of property to condition prior to solar development
- The timeframe for completion of decommissioning activities.
- Description of any agreement (e.g., lease) with landowner regarding decommissioning.
- The party responsible for decommissioning.
- Plans for updating the decommissioning plan.
- Before final electrical inspection, provide evidence that the decommissioning plan was recorded with the Register of Deeds.

Additional Resources

Template Solar Energy Development Ordinance for North Carolina (see Appendix G at pg. 21 for Sample Decommissioning Plan). **ncCleanTech.ncsu.edu/wp-content/uploads/Template-Solar-Ordinance_V1.0_12-18-13.pdf**

Land Use Planning for Solar. **training.ny-sun.ny.gov/images/PDFs/Land_Use_Planning_for_Solar_Energy.pdf**

Zoning Guide for Solar. **training.ny-sun.ny.gov/images/PDFs/Zoning_for_Solar_Energy_Resource_Guide.pdf**

Information on First Solar's recycling program for all of their modules **www.firstsolar.com/en/Technologies-and-Capabilities/Recycling-Services**

PV Cycle. Europe's PV recycling program **www.pvcycle.org/**

Solar Energy Industries Association (SEIA) information on solar panel recycling. **www.seia.org/policy/environment/pv-recycling**

Silicon Valley Toxics Coalition: **svtc.org/**

Silicon Valley Toxic Coalition Solar Scorecard **www.solarscorecard.com/2015/2015-SVTC-Solar-Scorecard.pdf**

End-of-life PV: then what? - Recycling solar panels **www.renewableenergyfocus.com/view/3005/end-of-life-pv-then-what-recycling-solar-pv-panels/**

NY-Sun, a dynamic public private partnership, will drive growth in the solar industry and make solar technology more affordable for all New Yorkers. NY-Sun brings together and expands existing programs administered by the New York State Energy Research and Development Authority (NYSERDA), Long Island Power Authority (LIPA), PSEG Long Island, and the New York Power Authority (NYPA), to ensure a coordinated, well-supported solar energy expansion plan and a transition to a sustainable, self-sufficient solar industry.

Exhibit F: Decommissioning Plan

The Devine-Johnson 5.0 MW AC community solar garden is designed to last 35 years. At the end of the project's operation, structures and foundations will be removed and the land restored as detailed below. All equipment will be removed from the site within twelve (12) months of termination of the lease agreement or twelve (12) consecutive months of the cessation of electric generation.

A portion of the Community Solar Garden (CSG) consists of recyclable materials and the scrap value of the system will help offset removal costs. A security will be set aside in the amount of $153,580 available to the City of Belle Plaine if DG Minnesota CSG 4, LLC are unwilling to commence with decommissioning activities within a reasonable period of time.

Decommissioning of the solar PV system shall be implemented in accordance with the Decommission Plan process. The Belle Plaine Planning Department shall receive a copy of the security document. DG Minnesota CSG 4, LLC will be responsible for all of the decommission costs and will list the City of Belle Plaine as having access to the security in the event decommissioning is required. DG Minnesota CSG 4, LLC will maintain a lease with the Property Owner for the life of the solar energy array and until decommissioning is complete.

Installation will be done with minimal permanent alterations to the land. Upon removal, DG Minnesota CSG 4, LLC will restore the project site to pre-construction conditions as is reasonably practical, including removal of structures, foundation, and restoration of soil and vegetation. The system will be dismantled and removed using minimal impact construction equipment and materials will be safely recycled or disposed. During the decommissioning, DG Minnesota CSG 4, LLC will use appropriate temporary construction-related erosion and sediment control best management practices (BMP).

Much of the material in a Community Solar Garden is recyclable; including glass, semiconductor material, steel, aluminum, copper and plastics. The scrap value of the system will offset the removal cost. When the project has reached the end of its operational life, the components and parts will be dismantled and recycled as described below.

Decommissioning requirements:

DG Minnesota CSG 4, LLC shall:

1. Obtain any permits required for the decommissioning, removal, and legal disposal of the system components prior to the commencement of the decommissioning activities
2. Remove all hazardous materials (if any) and transport them to be disposed of by licensed contractors at an appropriate facility in accordance with rules and regulations
3. Work with utility to disconnect PV array from power grid.
4. Remove transformer, inverters switch gear, power poles and fencing.
4. Break up concrete foundations and recycle materials.
5. Remove modules, DC wiring, junction boxes and steel racking.
6. Pull AC wiring from underground conduits.
7. Excavate and remove any conduit buried less than 3' deep.
8. Fill in storm-water ponds.
9. Reclaim gravel from access road.
10. Re-grade area to an approximation of the original contours

11. Reseed and mulch distributed areas using a seed mix pre-approved by the County or allow farm owner to re-seed.
12. Recycle gravel, concrete, rebar, fencing, steel piers, steel racking, solar modules, copper and aluminum wiring, inverters, disconnects, switchgear and transformer.

The project site may be converted to other uses in accordance with applicable land use regulations at the time of decommissioning. There will be very limited grading done to build the project, so only limited grading will be required to restore the land to its original condition. Any soil removed for construction purposes will be relocated on the site or used for landscaping after construction is complete.

Estimated Cost of Decommissioning:

Demo & Restoration Cost:	$ 122,864
Salvage Value:	($ 142,200)
Total Net Cost:	($ 19,336)

Decommissioning Fund:
The purpose of the decommissioning fund is to ensure there is sufficient money available to return the project site to an appropriate condition at the end of the project's useful life, or earlier.

The City will be designated beneficiary of the fund and will be provided a copy of the document establishing the security before construction commences. The decommissioning fund will initially be an irrevocable standby letter of credit, bond or escrow fund.

If DG Minnesota CSG 4, LLC is unable or unwilling to commence decommissioning activities within a reasonable period of time, not to exceed the allotted twelve-month period, the City of Belle Plaine will be granted access to demand payment under the security. Security will be in the amount of $153,580 (125% of decommissioning costs). It is also important to note that the project company's parent is a publically traded company with significant financial resources to ensure the proper decommissioning of the system.

Decommissioning Budget

No	Item	Unit	Est. Qty	Unit Price	Total
1	Fence Removal	/ft	5,483	$ 2.00	$ 10,966
2	Racking Frames	/frame	2,100	$ 4.00	$ 8,400
3	Racking Posts	/post	2,100	$ 5.00	$ 10,500
4	Solar Modules	/module	20,720	$ 3.25	$ 67,340
5	Inverters	/inverter	5	$ 1,000.00	$ 5,000
6	Transformers	/transformer	5	$ 1,000.00	$ 5,000
7	Wire (Copper)	/lb	14,920	$ 0.30	$ 4,476
8	Wire (Aluminum)	/lb	17,440	$ 0.30	$ 5,232
9	Concrete Removal	/sq. ft.	600	$ 4.50	$ 2,700
10	Site Restoration	/acre	26	$ 125.00	$ 3,250

Total $ 122,864

Salvage Value

No	Item	Unit	Est. Qty	Unit Price	Total
1	Fence Removal	/ft	5,483	$ 0.22	$ 1,206
2	Racking Frames	/frame	2,100	$ 0.68	$ 1,428
3	Racking Posts	/post	2,100	$ 0.16	$ 336
4	Solar Modules	/module	20,720	$ 4.00	$ 82,880
5	Inverters	/inverter	5	$ 1,000.00	$ 5,000
6	Transformers	/transformer	5	$ 2,000.00	$ 10,000
7	Wire (Copper)	/lb	14,920	$ 2.00	$ 29,840
8	Wire (Aluminum)	/lb	17,440	$ 0.66	$ 11,510

Total $ 142,200

OST Energy North America Inc
705 S. Main St. Suite 260
Plymouth, MI 48170

March 20, 2017

To Whom It May Concern;

This opinion of probable costs is based on the engineer's experience in the design and construction of energy facilities and is not based on any specific site or conditions. It is intended as a generic document to illustrate the potential costs for plants of this size. A revised estimate can be prepared when an specific site is contemplated. Costs have been split between plant disassembly, site restoration, and salvage which reflect that overall decomissioning process. This opinion assumes a third-party contractor, experienced in the construction and decomissioining of PV facilities will lead the effort. The reported costs include labor, materials, taxes, insurance, transport costs, equipment rental, contractor's overhead, and contractor's profit. Labor costs have been estimated using regional labor rates and labor efficiences from the Bureau of Labor Statistics.

The PV plant will first be disassembled, with all above and below grade components removed. This includes all buried cables, conduits, and foundations. Costs for disssembly are overall less than those for original assembly of the facility. While PV modules will need to be removed by hand to retain their savlage value, the racks, buried cables, and concrete can be removed by machine to increase efficiency.It is assumed that concrete, gravel, and fiber optic cable do not have salvage value and will be disposed off site for $95/ton or $45/cy. Other materials are assumed to have salvage value and can be sold at market prices.

It is expected that the entire site will be re-seeded with native grasses and vegetation. Planting of trees, shrubs, and other woody vegetation or other beautification is not included in the costs. It is assumed that re-grading of the site to remove diversion dikes and retiontion ponds is not required. The earth-moving required to remove these features would likely trigger a SPDES permit, which would in turn require those same features to be installed to control stormwater on the site.

Salvage values have been estimated using publicly available data from http://www.scrapmonster.com. Inverters were priced at the rate for Complete Computers, which is lower than what could be attained if they were disassembled on site. Transformers were priced at 80% of the market rate for Sealed Unit Transformers. PV modules were assumed to have residual value as functioning units. They are priced assuming the power output degrades at 0.4% per yer for 25 years, and 5% are broken during disassembly. The modules were assumed to have a market price of $0.10/W, which is half of the price projection for new modules made by the Department of Energy in year 25.

Joshua Berkow, PE
Principal Power Systems Engineering Consultant

705 S. Main Street. Suite 260
Plymouth, MI 48170
(734) 634-4088

3/20/2017
Date

Exh. SFS-LS-9

South Forty Solar Farm
South Forty Solar, LLC
Plan for Decommissioning Fund

1. Introduction

South Forty Solar, LLC ("SFS" or "Petitioner") submits this plan for the creation of a decommissioning fund in conjunction with its Petition for a section 248 Certificate of Public Good before the Vermont Public Service Board ("Board") regarding the South Forty Solar Farm.

2. Decommissioning Activities

As stated in Petitioner's prefiled testimony, at the time the Project ceases to operate, Petitioner will perform decommissioning which will include off-site removal of the solar panels, support structures, underground electrical lines, inverters, transformers, concrete pads, and fencing/fence posts. Decommissioning will also include restoring existing site conditions by returning soil immediately to areas that have been disturbed to remove underground wires.

3. Cost of Decommissioning

The Estimated Cost of Decommissioning the Project is $116,000, as reflected in the attached document. The Estimated Cost of Decommissioning shall be adjusted annually to account for inflation, based upon the current Consumer Price Index ("CPI") as maintained by the Bureau of Labor Statistics (the Revised Estimated Cost of Decommissioning). Petitioner shall file annual reports with the Board and the Department of Public Service on the status of the Decommissioning Fund after each annual adjustment.

4. Establishment of Decommissioning Fund

The Decommissioning Fund will initially be funded with an irrevocable standby Letter of Credit ("LC"), escrow account, bond, or other appropriate financial security that: (i) is bankruptcy remote; (ii) includes an auto-extension provision (i.e., "evergreen clause"); and (iii) is issued solely for the benefit of the Board. No other entity, including Petitioner, shall have the ability to demand payment under the LC (or other appropriate financial security). A draft Letter of Credit is attached to this Plan. An executed Letter of Credit, or other Board-approved financial security, shall be in place and filed with the Board prior to commencement of construction.

Petitioner shall calculate the annual inflation adjustment, as noted above, to determine the Revised Estimated Cost of Decommissioning. If the Revised Estimated Cost of Decommissioning exceeds the then-current Estimated Cost of Decommissioning, Petitioner shall cause a new or amended LC (or other appropriate financial security) to be issued to reflect the Revised Estimated Cost of Decommissioning. In the event the CPI has a negative value at the time the annual adjustment is calculated, the value of the LC (or other appropriate financial security) shall not be reduced.

At the end of the Project's useful life, and in the event Petitioner does not seek Board approval to repower the Project, Petitioner will decommission the Project as required under the Board's Order and CPG issued in this docket. Upon completion of decommissioning, Petitioner shall seek a certification of completion from the Board. The certification will be provided to the issuing bank with instructions to terminate the LC (or another appropriate financial security).

The Board shall have the right to draw on the LC (or other appropriate financial security) to pay the costs of decommissioning in the event that Petitioner (or its successor) is unable or unwilling to commence decommissioning due to dissolution, bankruptcy, or otherwise. Prior to the Board drawing on the LC (or other appropriate financial security), Petitioner shall have a reasonable period of time to commence decommissioning, not to exceed ninety days following issuance of a Board order requiring decommissioning of the Project.

Decommissioning Cost Estimate
South Forty Solar Farm, 2.5 MW PV — Estimate July 14, 2015

Removal

Remove modules	$17,000
Package & ship modules	$9,000
Disassemble rack	$20,000
Pull posts	$28,000
Package & ship rack & posts	$13,500
Remove & ship inverter sheds	$11,500
Remove electrical equipment & wiring	$4,500
Remove DC conduit & inverter foundation	$5,500
Dispose of material with no salvage value	$3,500
Site restoration – harrow & seed	$3,500
Total Decommission Cost	*$116,000*

Form of Letter of Credit

[NAME OF BANK]
IRREVOCABLE STANDBY LETTER OF CREDIT

Beneficiary
Vermont Public Service Board
112 State Street
Montpelier, VT 05620-2701
Attn: Contract Administration

Effective Date: [_____]

Letter of Credit No.: [_____]

Expiry Date: [_____]

Re: _____ Project
PSB Docket No. _____
CPG Issued on _____

At the request of _____ (the "Applicant" (the "Applicant"), **[NAME OF BANK]** (the "Issuer"), hereby issues this irrevocable Letter of Credit No. [_____] in the favor of the Vermont Public Service Board (the "Beneficiary") available for an aggregate amount up to the maximum amount of $[**Amount**] ([**Amount in words**] United States Dollars), effective as of the date first set forth above and expiring at our office located at (or at any other office which may be designated by us by written notice delivered to you) on the earliest to occur of (i) [**Expiration Date**] (the "Stated Expiration Date") or any automatically extended Stated Expiration Date, (ii) payment by Issuer hereunder of the maximum amount written above, or (iii) surrender of this original Letter of Credit to us for cancellation.

It is a condition of this Letter of Credit that the Stated Expiration Date shall be automatically extended without amendment, for successive periods of one year each from the Stated Expiration Date hereof or any such automatically extended Stated Expiration Date, unless, no less than 60 days before any such Stated Expiration Date, Issuer sends Beneficiary notice stating that this Letter of Credit will not be extended beyond the then current Stated Expiration Date. Any such notice of non-extension shall be in writing, shall be sent by hand, by certified mail (return receipt requested), or by Federal Express or other overnight delivery service, and shall be addressed to Beneficiary at the address set forth above.

Issuer has been requested to issue this Letter of Credit in connection with Condition No. __ of the Certificate of Public Good ("CPG") issued by the Vermont Public Service Board to _____ on _____, in Board Docket No. _____. Said Condition No. __ deals with the establishment of a Decommissioning Fund for _____'s ____ MW _____ electric generation project to be built in _____, Vermont. However, Issuer assumes no obligations under the CPG or responsibility or duties thereunder.

Funds under this Letter of Credit are available to you by making a demand for payment by presentation to us at our offices at _____, Attention: Loan Administration (or at any other office which may be designated by us by written notice delivered to you) of your drawing certificate in the form attached hereto ("Drawing Certificate") and accompanied by the original of this Letter of Credit. A presentation under this Letter of Credit may be made only on a day, and only between the hours of 9:00 AM and 5:00 PM, which such office is open for business (a "Business Day").

If we receive your Drawing Certificate and the original of this Letter of Credit at such office on any Business Day, all in reasonable conformity with the terms and conditions of this Letter of Credit, we will honor the same by making payment in accordance with your payment instructions on the third succeeding Business Day after presentation so long as the amount of the drawing, together with all previous drawings honored pursuant to this Letter of Credit, does not exceed the aggregate amount of this Letter of Credit. Typographical errors other than in amounts will not violate the conformity provision in this paragraph. If a drawing fails to conform to the terms and conditions of this Letter of Credit it shall not (i) preclude the Beneficiary from correcting any such errors and resubmitting the request nor (ii) act as a waiver of any rights the Beneficiary has under this Letter of Credit.

Partial and multiple drawings are permitted. All of the banking charges are for Applicant's account.

This Letter of Credit sets forth in full the terms of our undertaking to you (but not any of your duties, obligations or responsibilities to Issuer hereunder or otherwise). Such undertaking to you shall not in any way be modified, amended or amplified by reference to any document or instrument referred to herein or in which this Letter of Credit is referred to or to which this Letter of Credit relates and any such reference shall not be deemed to incorporate herein by reference any document or instrument.

Except as otherwise expressly stated herein, this Letter of Credit is subject to the International Standby Practices 1998, I.C.C. Publication No. 590 ("ISP98"), excluding, however, Rules 4.09(c) and 5.06(c)(i), and shall be governed by and construed in accordance with the laws of the State of _____. In the event of conflict between the ISP98 and a non-mandatory (variable) provision of such laws, the ISP98 shall govern.

Yours faithfully, **[NAME OF BANK]**

By: _____ By: _____

Name: Name:

Title: Title:

DRAWING CERTIFICATE

NAME OF BANK

Ladies and Gentlemen:

Capitalized terms used herein and not otherwise defined herein shall have the respective meanings given to such terms in the Letter of Credit.

The Beneficiary hereby certifies to the Issuer, with reference to the Issuer's Irrevocable Standby Letter of Credit No. _____ (the "Letter of Credit"); that:

In connection with the Agreement for the **CERTIFICATE OF PUBLIC GOOD ISSUED PURSUANT TO 30 V.S.A. SECTION 248** dated _____ and related documents between the Beneficiary and _____, the Beneficiary is making a demand for payment under the Letter of Credit of the sum of $_____ which amount does not exceed the current Stated Amount of the Letter of Credit; and

[The Beneficiary represents that it has issued an order that decommissioning shall occur and _____ or its successor is unable or unwilling to commence decommissioning activities within a reasonable period of time after the issuance of the order.]

Or

[This Letter of Credit has fewer than thirty (30) days remaining prior to the date of expiration and the Beneficiary has not received a replacement letter of credit to the extent required by the Agreement, and the undersigned hereby confirms that that the amount of this drawing does not exceed the undrawn face amount of the Letter of Credit.]

The amount demanded hereby has been calculated in accordance with the terms of the Agreement.

You are hereby directed to pay the amount so demanded to: **[Insert wire transfer instruction]**

IN WITNESS WHEREOF, the Beneficiary has executed and delivered this Certificate as of the

____day of_____, 201__.

Very truly yours,

_____

Name:

Title:

Norman E. Dupuis, P.E.
41 Millbrook Rd, Nantucket, MA 02554
Registration No: ME 40921

RE: Removal Cost Estimate 4 Oct 2017
For a Proposed 2.7 MW (DC) Solar Farm,
CEC Solar Development, LLC (Chester B)
Located at 215 Black Meadow Road, Chester, NY 10918

To Whom It May Concern:

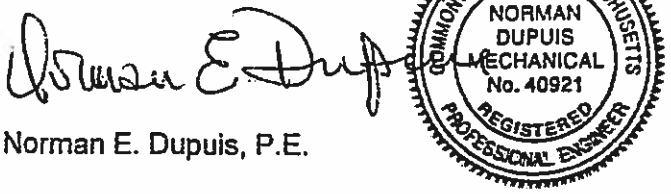
I have been requested by the management of the Clean Energy Collective, Inc, 146 West Boylston Drive, Worcester, MA 01606, to estimate, at today's dollar rates, the overall future cost of removing the proposed 2.7 MW (DC) Solar Farm that the Clean Energy Collective is proposing to install on a site at 215 Black Meadow Road, Chester, NY.

My qualifications for making such an estimate include eleven years of experience in the Solar Power Industry, beginning as a Project Manager in 2006, continuing as Regional Operations Manager, and, presently, as an Independent Solar Consultant. I have been a registered Professional Engineer (Mechanical) in California since 1975, and in Massachusetts since 1998.

I have reviewed the Solar Farm design and the equipment to be provided by the Clean Energy Collective (CEC), and worked with CEC personnel to develop a coordinated plan for removing the Solar Farm at the end of its effective life, when its use will be discontinued, expected to be approximately 20-25 years after installation. This "Decommissioning Plan" is attached hereto.

Our estimate for removing the Solar Farm following the attached Plan in 2017 dollars, is $62,000. Tasks to be carried out are listed in the Plan.

Sincerely,



Norman E. Dupuis, P.E.

Attachment: DECOMMISSIONING PLAN FOR CEC Solar Development, LLC, located at 215 Black Meadow Road, Chester, NY

DECOMMISSIONING PLAN FOR CEC Development, LLC

"CHESTER B"

Located at 215 Black Meadow Road, Chester, NY 10918

Use of the Solar Farm will be discontinued at the end of its effective life, expected to be approximately 20-25 years after installation. At that time the Owner, CEC Development, LLC, will physically remove the Solar Farm from the site. "Physically remove" will include, but not be limited to:

a) Removal of the Solar Collection Panel frames, supporting structures, foundations, electrical equipment and connections, CEC-installed utility poles and overhead wiring, all other equipment, equipment shelters and vaults, security barriers and all appurtenant structures from the Solar Farm site,
b) Proper disposal of all solid or hazardous materials and wastes from the site in accordance with local and State solid waste disposal regulations,
c) Restoration of the location of the Solar Farm site to its natural condition, except that any landscaping consistent with the character of the site and neighborhood, the gravel access drive, and the detention basins may remain.

We estimate the work will take 4-6 weeks to complete. Inverters, Transformers and Switchgear will be removed from their concrete pads. The electrical equipment will be sold back to the manufacturer or to a recycling facility. The project contains copper, aluminum and other metals that will be recycled. Racking materials and fencing will be pulled from the ground and folded for transport. The Owner will be responsible for all decommissioning costs and will obtain all permits or approvals required by the Town prior to commencing decommissioning work. The estimated cost of decommissioning the project is $62,000.00 (2017 dollars, see table below).

Removal Cost Estimate				
Item	Quantity	Rate/ea.	Days	Amount
Laborers	6	$200	25	$30,000
Heavy Equipment + Operator	2	$1,000	15	$30,000
Debris Container/Disposal	20	$850		$17,000
Material Salvage Value (incl hauling)	1			($20,000)
Site Repair (grade/seed)	1			$5,000
Total				$62,000

In order to meet the bonding/security requirements of the pending Introductory Local Law No. ____ of 2017 regulating solar energy systems and equipment, ARTICLE IX, Section 98-40 F (3)(b), the Owner proposes to place 125% of the Removal Cost Estimate ($77,500) into an Escrow Account for the benefit

of the Town. The Owner will review and adjust the Removal Cost Estimate at 5-year intervals in order to address inflation. Upon completion of removal and restoration work in accordance with this Plan, any funds not needed for said work will be returned to CEC.

Decommissioning Plan Date: 4 Oct 2017