EXCERPTS FROM DRAFT GEOTECH REPORT



August 4, 2021

Ms. Gina L. Wolfman Senior Project Developer Greenskies Clean Energy, LLC 127 Washington Avenue West Building – Lower Level North Haven, CT 06473

Re: Geotechnical Engineering Report Goshen Photovoltaic Solar Array Goshen, Connecticut SLR #145.16763.00011.0090

Dear Ms. Wolfman,

SLR International Corporation (SLR) is pleased to submit our geotechnical engineering report for the proposed Goshen Photovoltaic (PV) Solar Array located at 129 Bartholomew Hill Road in Goshen, Connecticut. Refer to Figure 1 – Locus Plan in Appendix 1 for the general location of the project.

This report includes subsurface information and geotechnical design and construction recommendations for the project. Our recommendations are based in part on guidance from the 2018 Connecticut State Building Code, which includes the 2015 International Building Code (IBC) and the 2018 Connecticut Amendments. Design recommendations are based on Allowable Stress Design Methods.

PURPOSE AND SCOPE

SLR observed subsurface explorations and performed a geotechnical engineering evaluation for the proposed PV solar array. Our scope of services included characterizing the subsurface conditions at the site, performing geotechnical engineering analyses, and providing geotechnical design and construction recommendations for the project.

SITE AND PROJECT DESCRIPTION

The project will be located within four open fields at the northern portion of an approximate 69-acre parcel on the north side of Bartholomew Hill Road. The site is surrounded by undeveloped land or open fields to the west, north, and east and Bartholomew Hill Road to the south. Site grades vary from approximately El. 1580 at the north end of the site and slopes downward to the south to approximately El. 1485. August 4, 2021 Ms. Gina L. Wolfman Page 2



We understand the project includes the construction of a 4.0-MW AC PV ground-mounted solar array system. The solar panels are generally lightly loaded and consist of metal frames that elevate the panels above grade and allow for the panels to be positioned at a specified angle and direction. Final sites grades will generally remain unchanged, with minimal tree clearing between the open fields.

REGIONAL GEOLOGY

According to published surficial geology data (1:24,000 scale, Surficial Geologic Map of the Cornwall Quadrangle, Litchfield, Connecticut, Charles R. Warren and Roger B. Colton, 1974), the subsurface material at the site is mapped as till described as "chiefly a nonsorted mixture of sand, silt, clay, pebbles, cobbles, and boulders."

According to published bedrock geology data (1:24,000 scale, Geologic Map of the Cornwall Quadrangle, Connecticut, Robert M. Gates, 1956-1960), the bedrock at the site is mapped as the Waramaug Formation. The Waramaug Formation is described as "rusty weathering quartzo-feldspathic biotite gneiss and sillimanite-garnet-quartzo-feldspathic biotite gneiss."

SUBSURFACE EXPLORATIONS

On June 3, 2021, SLR observed six test pits (TP-1 through TP-6) that were performed in the areas of the proposed solar array by David M. Koch Landscaping, LLC of Middlebury, Connecticut. On June 11, 2021, SLR also observed seven borings (B-1 through B-7) that were performed in the areas of the solar array by SITE, LLC of Beacon Falls, Connecticut. The test pits and borings were performed to explore the subsurface conditions in the areas of the solar array and were located by a handheld Global Positioning System. Their approximate locations are shown on Figures 2 and 3 – Subsurface Exploration Location Plan in Appendix 1.

Borings

Hollow-stem augers were used to advance the borings to depths ranging between 6.7 and 17.0 feet below current sites grades. Representative samples were obtained from the borings by split-barrel sampling procedures in general accordance with American Society for Testing and Materials (ASTM) Specification D-1586. Logs of the borings are included in Appendix 2.

The split-barrel sampling procedure utilizes a standard 2-inch-outside diameter (O.D.) split-barrel sampler that is driven into the bottom of the boring with a 140-pound hammer falling 30 inches. The number of blows required to advance the sampler the middle 12 inches of a normal 24-inch penetration is recorded as the Standard Penetration Resistance Value (N). The blows are indicated on the boring logs at their depth of occurrence and provide an indication of the consistency or relative density of the material.

Test Pits

The test pits were performed using a Caterpillar 304E2 excavator with an approximate bucket capacity of 0.25 cubic yards and an arm reach of approximately 10 feet. The depths of the test pits ranged from approximately 5.0 to 10.0 feet below existing grades. Logs of the test pits are included in Appendix 3.

SUBSURFACE CONDITIONS

The subsurface profile generally consists of topsoil, over subsoil or fill (where encountered), over glacial till, over bedrock to the depths explored. Below are more detailed descriptions of the subsurface materials encountered:

Topsoil was encountered at the surface of each boring and each test pit and is approximately 0.5 to 2.0 feet thick. The topsoil generally consists of very loose to loose, dark brown, fine to coarse sand, some to and silt, trace fine gravel, trace organics.

Subsoil was encountered below the topsoil in all borings and test pits except in Borings B-2 and B-6 and Test Pit TP-1 and is approximately 0.5 to 1.5 feet thick. The subsoil consists of brown, fine to coarse sand, some to and silt, trace fine gravel, trace organics.

<u>Fill</u> was encountered below the topsoil in Boring B-6 and is approximately 2.0 feet thick. The fill consists of loose to medium dense, dark brown, fine to coarse sand, little silt, trace fine gravel.

<u>Glacial Till</u> was encountered in each boring and test pit below the topsoil, subsoil, or fill and is at least 2.5 to 15.0 feet thick. The glacial till generally consists of loose to very dense, gray, fine to coarse sand, trace to and fine to coarse gravel, trace to and silt.

Bedrock was inferred by refusal of the drilling tools in Borings B-1 through B-4 between 6.7 and 14.4 feet below existing grades. In Boring B-1, approximately 2.2 feet of weathered bedrock was encountered above the more competent bedrock that generally consists of very dense, gray, fine to coarse gravel, some fine to coarse sand, trace silt.

<u>Groundwater</u> was encountered in each boring and test pit except in Boring B-1 and Test Pits TP-3 and TP-6 between approximately 3.5 and 6.5 feet below existing grades. Groundwater levels will vary depending on factors such as season, precipitation, construction activity, and other conditions, which may be different from those at the time of these observations.



					В	ORIN	IG LO	G						
PROJECT:			PROPOSED GOSHEN PHOTOVOLTAIC SOLAR ARRAY				BORING NO.: B-4 SHEET:			E T: 1 of 1				
SLR 🖉 🛛			LOCATION:	129 BARTHOLO	OMEW HILL ROA	AD, GOSHEN, CO	ONNECTICUT	CONTRACTOR: S	SITE, LLC					
SLR International Corporation, Inc.			PROJ. NO:	145.16763.000	11			Foreman: J. De	ANGELIS					
99 Realty Drive, Cheshire, CT 06410			CLIENT:	GREENSKIES CLEAN ENERGY, LLC INSPECTOR: R. GOWISNOCK										
203.271.1773 www.slrconsulting.com			DATE:	JUNE 11, 2021 GROUND SURFACE ELEVATION: ±1565.5							-			
QUIPMENT: AUGER		CASING	SAMPLER COREBRL. GROUNDWATER DEPTH (FT.)					TYPE OF RIG:						
YPE HSA		-	SS	-	DATE	TIME		WATER DEPTH	TRACK W/ AUTOMA			MER		
IZE ID (IN.) 2 1/4		-	1 3/8	-	2021-06-11	10:15 AM		±6.0'	RIG MODEL:					
IMR. WT (LB.) -		-	140	-						CME-55 LCX				
IMR. FALL (IN.)		-	30 -											
Depth SAMPLE		RECOVERY	BLOWS	SOIL AND ROCK CLASSIFICATION-DESCRIPTION						PTH (:	STRATUM	Э. Г	mark	
(FT)	NUMBER	(IN)	PER 6"	BURMISTER SYSTEM (SOIL) U.S. CORPS OF ENGINEERS SYSTEM (ROCK)					E DE	DESCRIPTION		Re		
	S-1 S-2		WOH 1	S-1: Very loose Bottom 10": Br	, Top 9": Dark brown, fine to coarse SAND and SIL1, trace fine Gravel, trace Organics. rown, fine to medium SAND and SILT, trace fine Gravel.				1.0'	TOPSOIL	1564 5'			
1		19	2		socion 20 - brown, nile to medium salvo and sici, trace nile dravel.						SUBSOII	100 110		
2			6	S-2. Loose gra	v fine to coarse	SAND some C	Navey Silt trace fine Gravel			2.0'		1563.5'		
2		18	2	5 2. 2003C, gru	5 2. 2000, Bray, file to coarse on to, some clayey sit, trace file OldVel.									
3			3	_										
4			3											
5				S-3: Medium dense, gray, fine to coarse SAND, some Silt, little fine to coarse Gravel.										
			4 5							6.0'	G.W.T. 🔽	1559.5'		
6	S-3	16	5								_			
7			8	-										
8								GLACIAL TILL						
				-										
9														
10			0	6 4: Vory dong										
	6.4	20	13					e GRAVEL, Some	5					
11	3-4	20	20 46											
12			30											
13														
				Bottom of Exploration ±13.6'						13.6'		1551.9'	1	
14														
15				+										
16														
17														
18														
10														
19														
20														
21				1										
				-										
22				1										
emarks	1. Auger refu	sal at ±13.6'			NON-PLAS	TIC (SPT-N)	PLAS	FIC (SPT-N)	SAMPLE TYPF		PROPORTI	ONS		
					0-4 = VERY LOOSE	. ,	0-2 = VERY SOF	т	C = ROCK CORE		trace = <10%			
					4-10 = LOOSE	DENSE	2-4 = SOFT		S = SPLIT SPOON		little = 10% - 20%			
					30-50 = DENSE		8-15 = STIFF		UT = UNDISTURBED THINWALI	<u>.</u>	and = 35% - 50%			
					50+ = VERY DENSE	E	15-30 = VERY ST 30 + = HARD	IFF						

		TEST	PIT LOG					
	\sim		Test Pit No: TP-3					
S	LR	Proposed Goshe	Sheet: 1 of 1					
SLR Internat	tional Corporation, Inc.		MMI File No: 14	MMI File No: 145.16763.00011				
99 Realty Dr <u>203.271.1773</u>	ive, Cheshire, CT 06410	129 Bartholomew F	Checked By: R. Gowisnock					
MMI Rep.: R. Hend	erson	Make: Caterpilla	Ground Elev: ±1564.5'					
Exc. Contractor: Da	wid M. Koch Landscaping, LLC	Model: 304E2			Datum: N/A			
Exc. Operator: D. K	och	Capacity: 0.25 c	Date: June 3, 2021					
Weather: Overcast	, 70's	Reach: ±10.0'	Time Start: 9:45 a.m					
Depth Below Grade (ft)	Strata Change & Water Level	Subsu	Excavation Effort	Boulder Qty/Class	Notes			
1	TOPSOIL	Dark brown, SILT, some fine to med	E	None				
	SUBSOIL	Brown, fine to medium SAND and S	E	None				
2		Gray, fine to coarse SAND, some fin	Μ					
3			М					
4	GLACIAL TILL				М	None		
5					м		1	
6		Bottom						
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
Notes: 1. No groundwater encountered.						Water Symbols		
						For a contract of the second secon		
Test Pit Dim	ensions & Orientation	BOULDER COUNT	PROPORTIO	NS USED	EXCAVATION EFFORT			
ם חי		Boulder Class	< 10%	Irace	E = Easy			
5.0'	N	12 -24 A 24"-36" B	20-35%	Some	M = Moderate D = Difficult			
		>36" C	35-50%	And				

TEST PIT LOG										
	\sim		Test Pit No: TP-4							
S		Proposed Goshe	Sheet: 1 of 1							
SLR Interna	tional Corporation, Inc.				MMI File No: 145.16763.00011					
99 Realty De 203.271.1773	rive, Cheshire, CT 06410 8 <u>www.slrconsulting.com</u>	129 Bartholomew F	Checked By: R. Gowisnock							
MMI Rep.: R. Hend	lerson	Make: Caterpilla	Ground Elev: ±1569.5'							
Exc. Contractor: Da	avid M. Koch Landscaping, LLC	Model: 304E2	Datum: N/A							
Exc. Operator: D. K	loch	Capacity: 0.25 c	Date: June 3, 2021							
Weather: Overcast	, 70's	Reach: ±10.0'	Time Start: 10:00 a.m							
Depth Below Grade (ft)	Strata Change & Water Level	Subsu	Excavation Effort	Boulder Qty/Class	Notes					
1	TOPSOIL	Dark brown, SILT, some fine Sand, li	E	None						
2	SUBSOIL	Brown, fine to medium SAND and S	E	None						
3		Gray, fine to coarse SAND, some Silt	E							
4	GLACIAL TILL 🔻				E	None	1			
5					E					
6		Bottom of Exploration ±5.0'								
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
Notes: 1. Long-term equilibrium groundwater levels measured at approximately 4 feet below existing grades.				<u>\</u>	Water Symbols					
						💙 = Groundwater				
Test Pit Dim	nensions & Orientation	BOULDER COUNT	PROPORTI	ONS USED	EXCAVATION EFFORT					
۹ n'		Boulder Class	< 10%	I race	.	E = Easy				
5.0'	N	12 -24 A 24"-36" B	20-35%	Some	D = Difficult					
		>36" C	35-50%	And						