### COMMONWEALTH OF KENTUCKY

## BEFORE THE KENTUCKY STATE BOARD ON ELECTRIC GENERATION AND TRANSMISSION SITING

T .	41	<b>N</b> #		c
l n	tha	N/I	atter	Λt•
	unc	171	auu	vı.

ELECTRONIC APPLICATION OF GREEN	)	
RIVER SOLAR, LLC FOR A CERTIFICATE TO	)	
CONSTRUCT AN APPROXIMATELY 200	)	
MEGAWATT MERCHANT SOLAR ELECTRIC	)	CASE NO. 2020-00387
GENERATING FACILITY IN BRECKINRIDGE	)	
COUNTY AND MEADE COUNTY, KENTUCKY	)	
PURSUANT TO KRS 278.700 AND 807 KAR	)	
5:110	)	

## RESPONSES TO SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION

TO GREEN RIVER SOLAR, LLC
DATED NOVEMBER 3, 2021
GREEN RIVER SOLAR, LLC
PSC CASE NO. 2020-00387

### SITING BOARD STAFF REQUEST DATED 11/3/2021

Green River Solar, LLC (Green River Solar) hereby submits responses to the Post-Hearing Request for Information of the State Board on Electric Generation and Transmission Siting (Siting Board) in this case dated November 3, 2021. Each response with its associated supportive reference materials is individually bookmarked.

### COMMONWEALTH OF KENTUCKY

### BEFORE THE KENTUCKY STATE BOARD ON ELECTRIC GENERATION AND TRANSMISSION SITING

IN	THE	<b>MAT</b>	TER	OF:
TT 4	****	T 4 T 7 T T	111	$\sim$ 1.

THE ELECTRONIC APPLICATION OF GREEN	)
RIVER SOLAR, LLC FOR A CERTIFICATE TO	)
CONSTRUCT AN APPROXIMATELY 200	)
MEGAWATT MERCHANT SOLAR ELECTRIC	)
GENERATING FACILITY IN BRECKINRIDGE	)
COUNTY AND MEADE COUNTY, KENTUCKY	·)
PURSUANT TO KRS 278.700, ET SEQ. AND	)
807 KAR 5:110	)

CASE NO. 2020-00387

### **VERIFICATION OF** LINA JENSEN

Comes now LINA JENSEN, on behalf of Green River Solar, LLC and, after first being duly sworn, does hereby swear and affirm that the foregoing responses to the Siting Board's Post-Hearing Request for Information and information attached thereto is true and correct to the best of my knowledge and belief, formed after reasonable due diligence and inquiry, as of this 15th day of November, 2021.

> TAMIKO FOSTER MY COMMISSION # GG 305952 **EXPIRES: June 25, 2023** Bonded Thru Notary Public Underwriters

NOTARY PUBLIC

Commission No.:

Commission Expires: 6/25/2023

### GREEN RIVER SOLAR, LLC

### CASE NO. 2020-00387

### RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

**POST-HEARING REQUEST** 

**RESPONSIBLE PARTY:** Lina Jensen

Provide an updated copy of the Site Plan that was presented to the Meade Request 1.

County Planning Commission on October 18, 2021, which encompasses the residence to be

demolished, and the resulting new area of solar panels proposed within the Project.

Response 1.

Please see Attachment 1 for the Site Plan that was presented to the Meade County Board of

Adjustments on October 18. Please note that this Site Plan only contains the portion of the Project

located in Meade County and does not include the Site Plan pages that are in Breckenridge County.

Attachment 4 contains a full updated set of drawings, including these changes and additional

modifications to vegetative buffers.

The Meade County Board of Adjustments approved the Green River Conditional Use Permit on

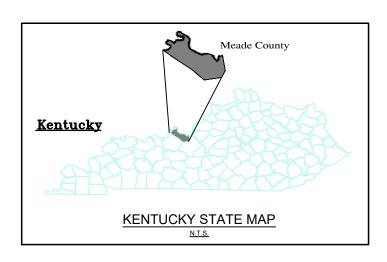
Nov 8. The conditions imposed by the Meade County Board of Adjustments are included in

Attachment 6.

## **CONCEPTUAL SITE PLAN**

# GREEN RIVER SOLAR PROJECT

PREPARED FOR



SITE ADDRESS	TBD
COUNTY PARCEL NUMBER	VARIOUS
GPS COORDINATES	37.908° N, -86.261° W (PROJECT SUBSTATION)
SITE ELEVATION	680 FT A.M.S.L.
UTILITY NAME	TBD
UTILITY ADDRESS	TBD
UTILITY CONTACT INFORMATION	TBD
DEVELOPER NAME	GREEN RIVER SOLAR, LLC
DEVELOPER ADDRESS	700 UNIVERSE BLVD., JUNO BEACH, F
DEVELOPER CONTACT	LINA JENSEN
CIVIL ENGINEER OF RECORD (EOR) NAME	TBD
CIVIL EOR ADDRESS	TBD
CIVIL EOR CONTACT INFORMATION	TBD
APPLICABLE BUILDING PERMIT AUTHORITY	TBD
SYSTEM SIZE (MW)	200 MW TOTAL
SYSTEM DC SIZE (MW)	TBD
TRANSFORMER COUNT	1
EQUIPMENT PAD COUNT	TBD
PROJECT ZONING	AGRICULTURAL
NON PARTICIPATING PARCEL BUFFER	50 FEET
OCCUPIED STRUCTURE BUFFER	250 FEET
ROAD R.O.W. BUFFER	25 FEET
SURFACE WATER BUFFER	25 FEET
WETLAND BUFFER	25 FEET
STREAM BUFFER	25 FEET
PROJECT AREA	1,750 ACRES
ROAD LENGTH	63,200 FEET
LANDSCAPE BUFFER	9,930 FEET

**ALTA SURVEY BY:** 



## **GREEN RIVER SOLAR, LLC** 700 UNIVERSE BLVD **JUNO BEACH, FL 33408**

Contact: Lina Jensen, Project Director NextEra Energy Resources (832) - 613 - 7247

MEADE COUNTY, **KENTUCKY**, 40146

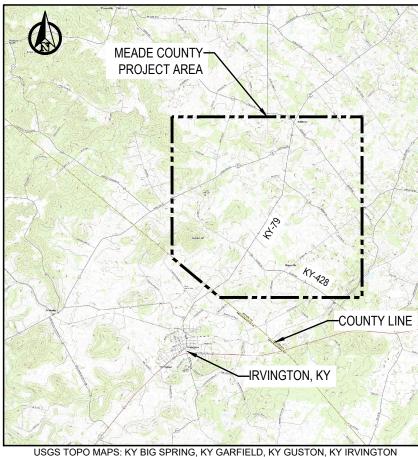
BY



707 East Third Avenue New Smyrna Beach, Florida 32169 Tel: (386) 427-0694 Fax: (386) 427-0889 Agent's E-mail: cfagerstrom@ectinc.com Agent's Tel: (386) 852-0387 http://www.ectinc.com

ECT PROJECT NUMBER 20-0594

**OCTOBER 2021 MEADE COUNTY SITE PLAN REVIEW SET** 



## PROJECT LOCATION MAP

### INDEX OF DRAWINGS

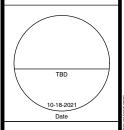
C1.00	COVER PAGE
C1.01	EXISTING CONDITIONS
C1.02	MEADE COUNTY SITE PLAN
C2.01 -	SITE EXHIBITS
C2.08	
C3.01	CONSTRUCTION DETAILS
C3.02	LANDSCAPE ILLUSTRATION
C3.03	AEROCOMPACT® DETAILS

New Smyrna Beach, FL, 32169 Phone: (386) 427-0694 www.ectinc.com

NEXT**ERA** ENERGY 🐼

### **GREEN RIVER SOLAR** MEADE COUNTY, **KENTUCKY**

ECT PROJECT No.:	20-0594
DESIGNED BY:	NextEra Energy, Inc.
DRAWN BY:	MRA
CHECKED BY:	DMW/XG
APPROVED BY:	TBD
CONCEPT PLAN	06-25-2021
KY SITING BOARD	07-09-2021
MEADE CO. PLAN	07-13-2021
MEADE CO. PLAN RESUBMITTAL 1	08-11-2021
KY SITING BOARD RESUBMITTAL	09-22-2021
MEADE CO. PLAN RESUBMITTAL 2	10-18-2021

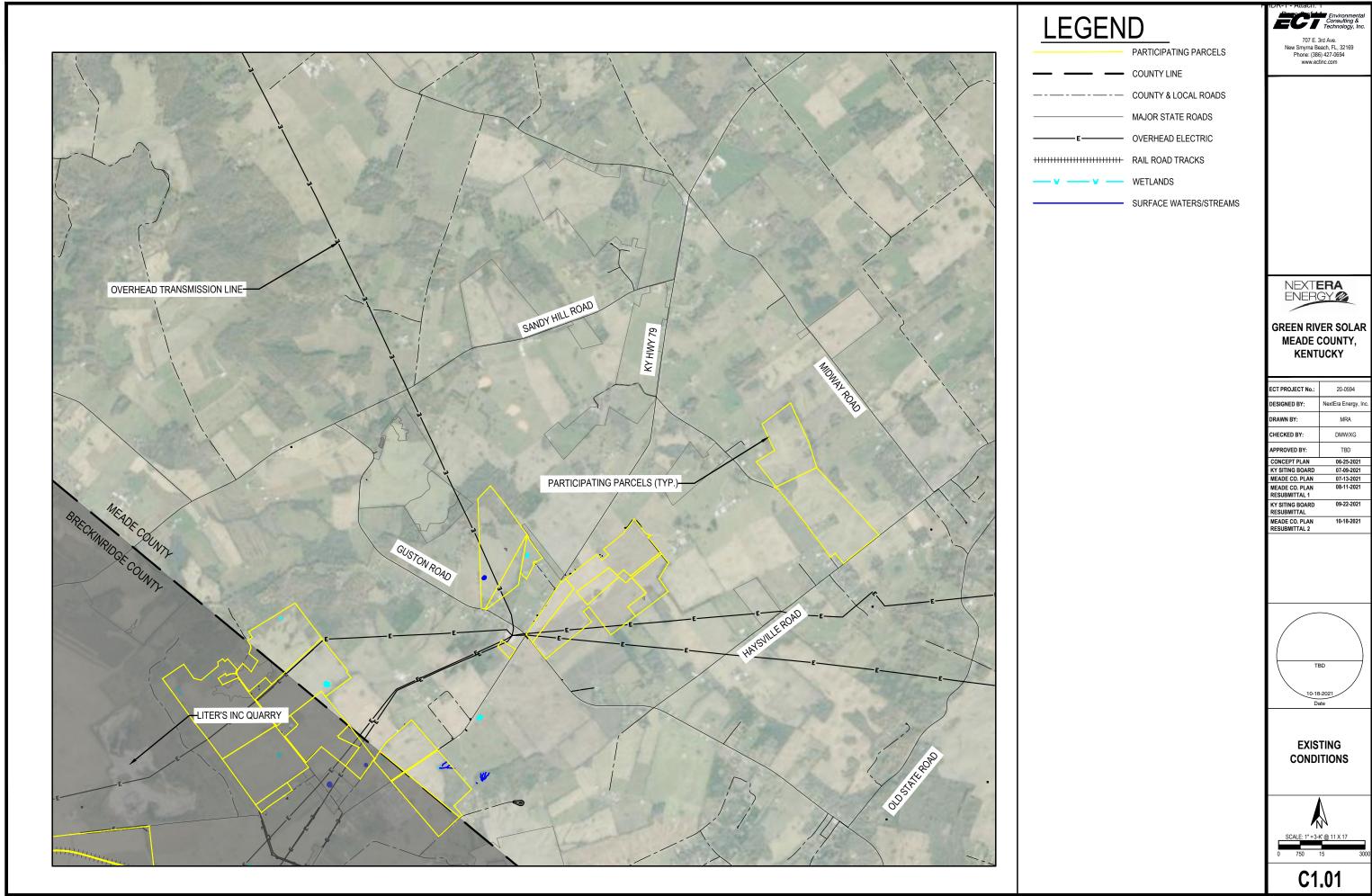


**COVER PAGE** 

C1.00

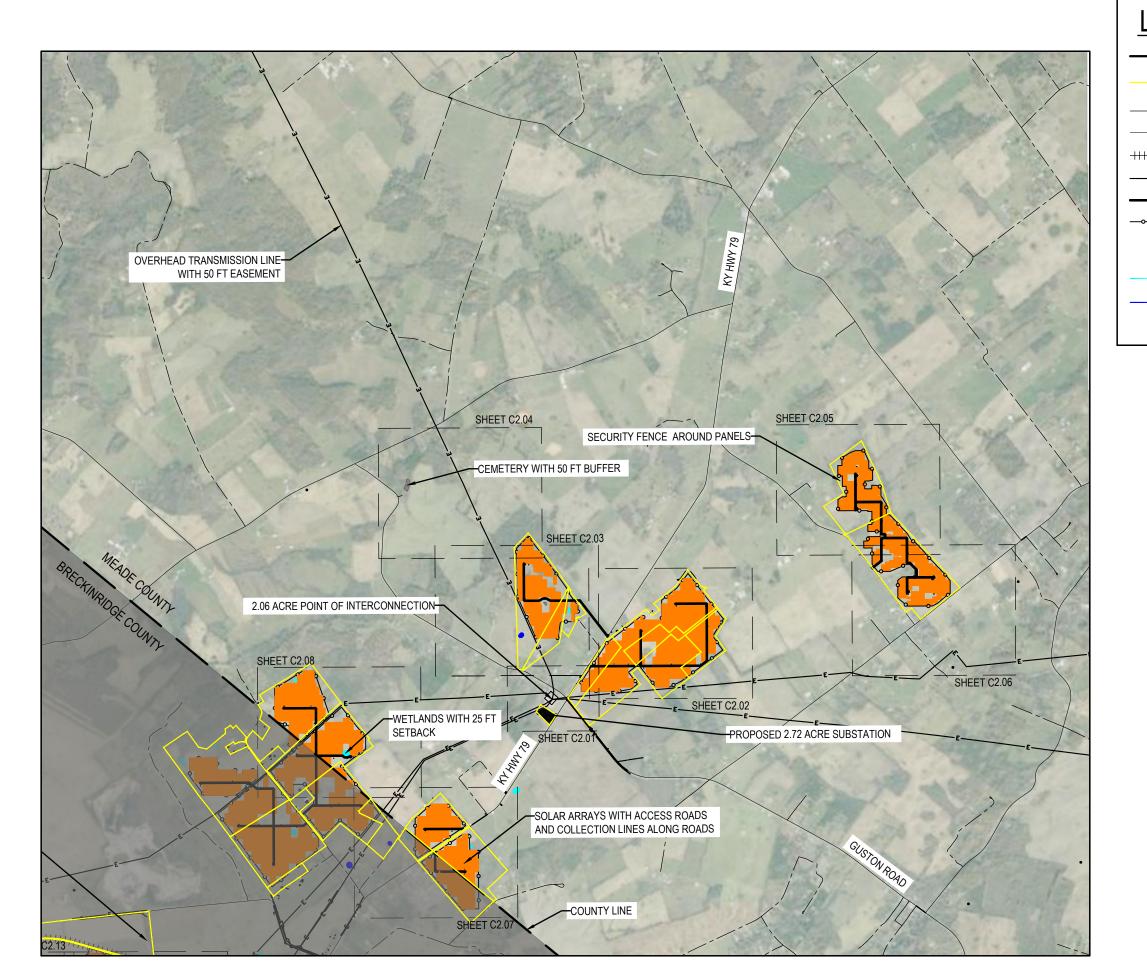
NOT FOR CONSTRUCTION

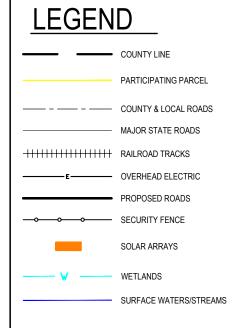
Case No. 2020-00387
Green River Solar, LLC



NOT FOR CONSTRUCTION

Case No. 2020-00387
Green River Solar, LLC



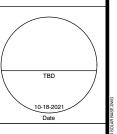




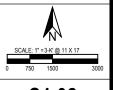


### GREEN RIVER SOLAR MEADE COUNTY, KENTUCKY

ECT PROJECT No.:	20-0594
DESIGNED BY:	NextEra Energy, Inc.
DRAWN BY:	MRA
CHECKED BY:	DMW/XG
APPROVED BY:	TBD
CONCEPT PLAN	06-25-2021
KY SITING BOARD	07-09-2021
MEADE CO. PLAN	07-13-2021
MEADE CO. PLAN RESUBMITTAL 1	08-11-2021
KY SITING BOARD RESUBMITTAL	09-22-2021
MEADE CO. PLAN	10-18-2021



### MEADE COUNTY SITE PLAN

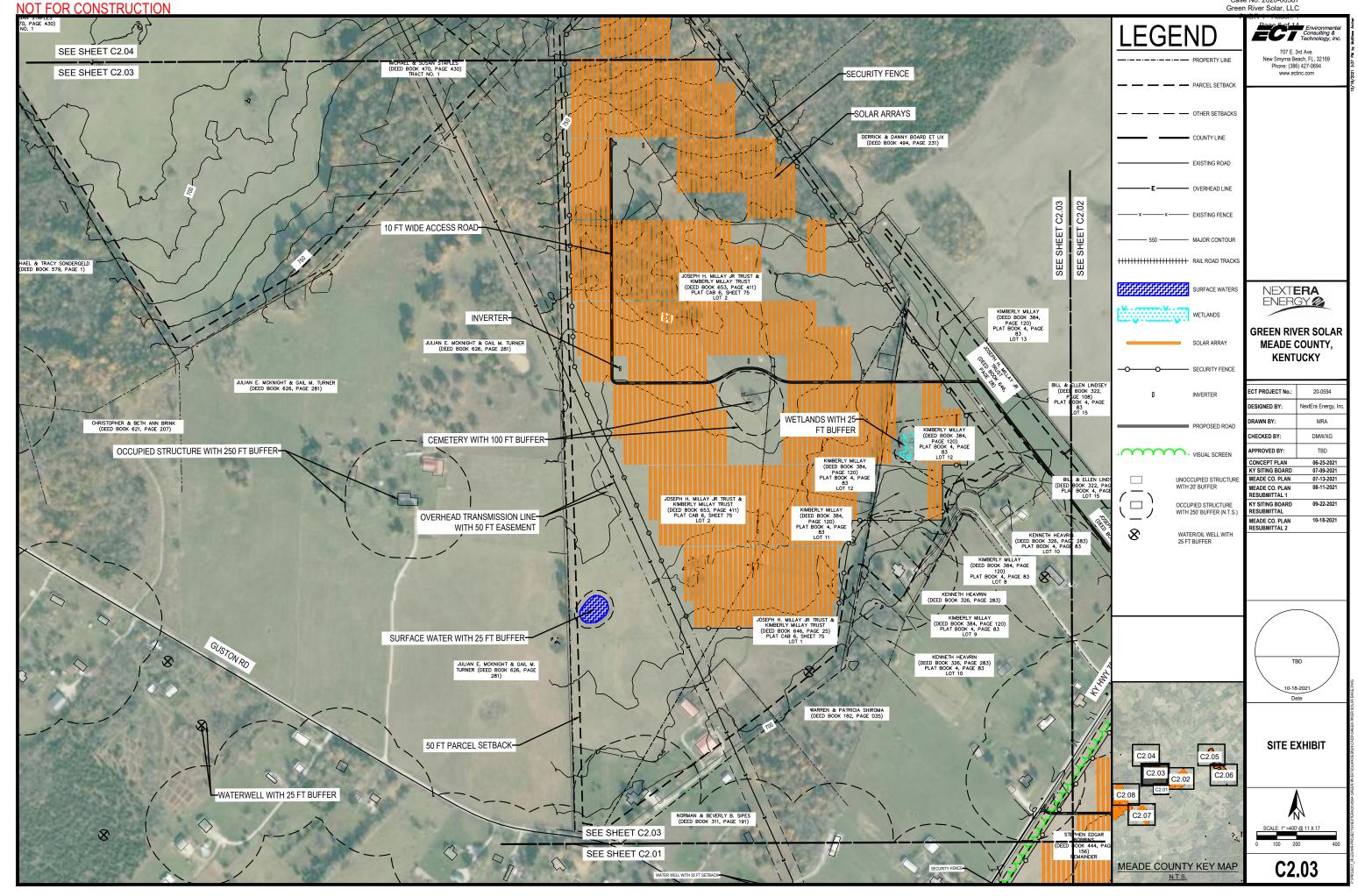


C1.02

JOHN A. FLAHERTY (DEED BOOK 381, PAGE 185)

TOM H. TOBIN
(DEED BOOK 631, PAGE 128)

MEADE COUNTY KEY MAP



Case No. 2020-00387 Green River Solar, LLC NOT FOR CONSTRUCTION **LEGEND** 707 E. 3rd Ave. New Smyrna Beach, FL, 32169 Phone: (386) 427-0694 www.ectinc.com PARCEL SETBACK OTHER SETBACKS EXISTING ROAD OVERHEAD LINE LAWRENCE M. & ANNA M. ZEITZ (DEED BOOK 322, PAGE 226) JOHN & DAWN MACFARLAND (DEED BOOK 460, PAGE 317) OCCUPIED STRUCTURE WITH 250 FT BUFFER NEXT**ERA** ENERGY SURFACE WATERS WETLANDS GREEN RIVER SOLAR **MEADE COUNTY,** SOLAR ARRAY **KENTUCKY** NON-PARTICIPATING PARCEL WITH 50 FT SETBACK CT PROJECT No.: 20-0594 INVERTER NextEra Energy, Ir SIGNED BY: CEMETERY WITH 50 FT BUFFER MRA RAWN BY: PROPOSED ROAD HECKED BY: TBD OVERHEAD TRANSMISSION LINE PROVED BY: MICHAEL & SUSAN STAPLES (DEED BOOK 470, PAGE 430) TRACT NO. 1 VISUAL SCREEN MICHAEL & SUSAN STAPLES (DEED BOOK 475, PAGE 29) WITH 50 FT EASEMENT ONCEPT PLAN 06-25-2021 Y SITING BOARD 07-09-2021 MEADE CO. PLAN UNOCCUPIED STRUCTURE WITH 20' BUFFER MEADE CO. PLAN RESUBMITTAL 1 09-22-2021 Y SITING BOARD OCCUPIED STRUCTURE WITH 250' BUFFER (N.T.S.) 10-18-2021 MEADE CO. PLAN RESUBMITTAL 2 WATER/OIL WELL WITH 25 FT BUFFER EXISTING FENCE LAWRENCE M. & ANNA M. ZEITZ (DEED BOOK 322, PAGE 226) LAWRENCE M. & ANNA M. ZEITZ (DEED BOOK 322, PAGE 226) LAWRENCE M. & ANNA M. ZEITZ (DEED BOOK 322, PAGE 226) SECURITY FENCE-SOLAR PANELS-SITE EXHIBIT C2.05 C2.06 MICHAEL & SUSAN STAPLES (DEED BOOK 470, PAGE 430) TRACT NO. 1 SEE SHEET C2.04 SEE SHEET C2.03 C2.04 MEADE COUNTY KEY MAP

Case No. 2020-00387 Green River Solar, LLC NOT FOR CONSTRUCTION **LEGEND** 707 E. 3rd Ave. New Smyrna Beach, FL, 32169 Phone: (386) 427-0694 www.ectinc.com PARCEL SETBACK OVERHEAD LINE SECURITY FENCE- EXISTING FENCE NEXT**ERA** ENERGY WETLANDS OCCUPIED STRUCTURE
WITH 250 FT BUFFER **GREEN RIVER SOLAR** WATER WELL WITH 25 FT BUFFER **MEADE COUNTY, KENTUCKY** SOLAR PANELS - SECURITY FENCE CT PROJECT No.: 20-0594 INVERTER NextEra Energy, In-SIGNED BY: MRA RAWN BY: PROPOSED ROAD CHECKED BY: PROVED BY: TBD . VISUAL SCREEN 06-25-2021 07-09-2021 -50 FT PARCEL SETBACK ONCEPT PLAN Y SITING BOARD 16' WIDE ACCESS ROAD MEADE CO. PLAN UNOCCUPIED STRUCTURE WITH 20' BUFFER MEADE CO. PLAN RESUBMITTAL 1 09-22-2021 OCCUPIED STRUCTURE WITH 250' BUFFER (N.T.S.) MEADE CO. PLAN RESUBMITTAL 2 10-18-2021 WATER/OIL WELL WITH 25 FT BUFFER INVERTER DOOLEYROAD SITE EXHIBIT X SEE SHEET C2.05 SEE SHEET C2.06

C2.05

MEADE COUNTY KEY MAP

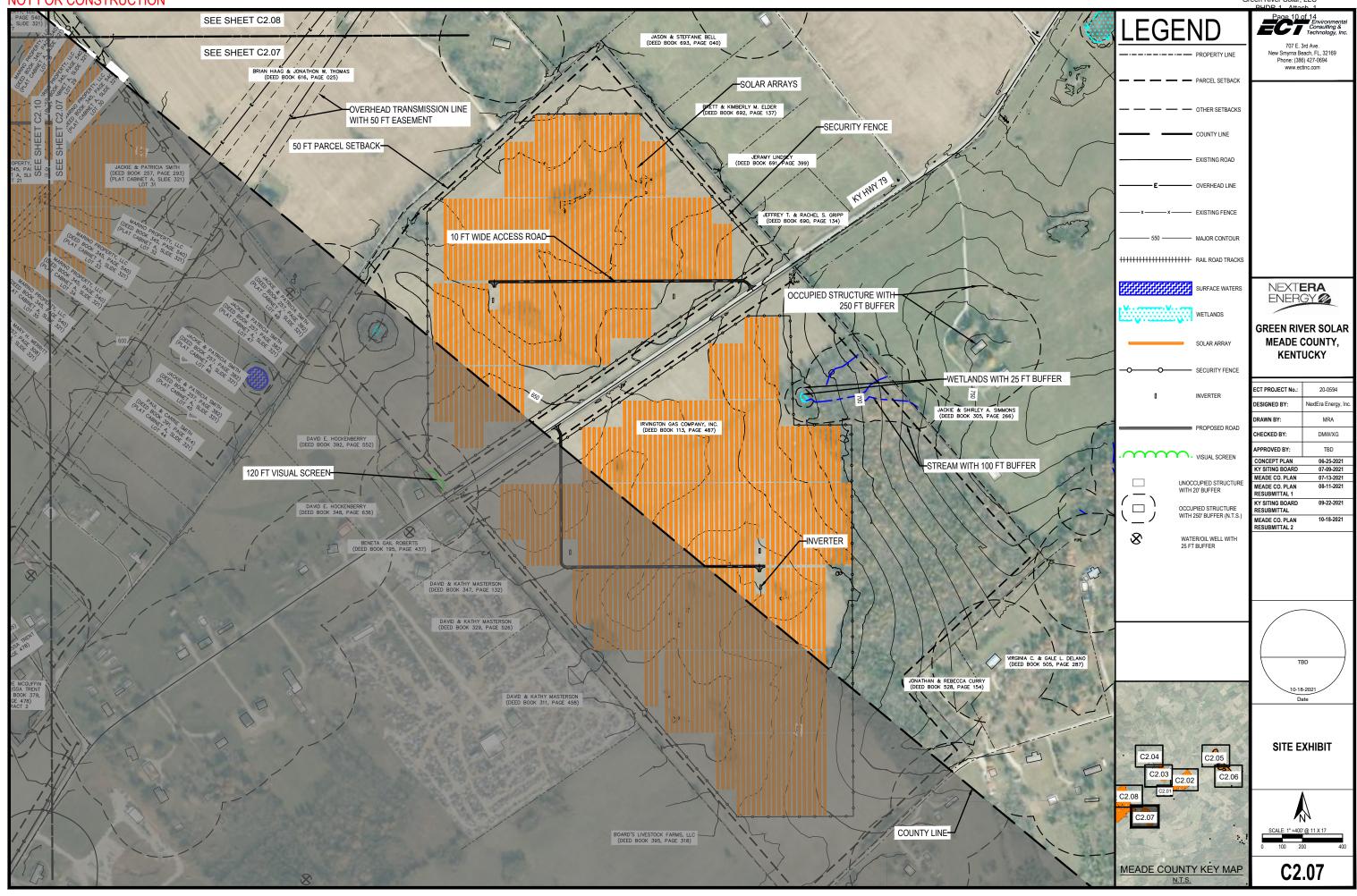
Case No. 2020-00387 Green River Solar, LLC NOT FOR CONSTRUCTION **LEGEND** SEE SHEET C2.05 707 E. 3rd Ave. New Smyrna Beach, FL, 32169 Phone: (386) 427-0694 www.ectinc.com SEE SHEET C2.06 16' WIDE ACCESS ROAD OTHER SETBACKS EXISTING ROAD SOLAR ARRAYS OVERHEAD LINE HHHHHHHHHHHH RAIL ROAD TRACKS 830 FT VISUAL SCREEN NEXT**ERA** ENERGY WATER WELL WITH 25 FT BUFFER WETLANDS **GREEN RIVER SOLAR MEADE COUNTY,** SOLAR ARRAY **KENTUCKY** CT PROJECT No.: 20-0594 INVERTER--50 FT PARCEL SETBACK NextEra Energy, In SIGNED BY: MRA RAWN BY: PROPOSED ROAD HECKED BY: PROVED BY: TBD VISUAL SCREEN 1,690 FT VISUAL SCREEN-06-25-2021 07-09-2021 CONCEPT PLAN Y SITING BOARD SECURITY FENCE MEADE CO. PLAN UNOCCUPIED STRUCTURE WITH 20' BUFFER MEADE CO. PLAN RESUBMITTAL 1 09-22-2021 KY SITING BOARD RESUBMITTAL OCCUPIED STRUCTURE WITH 250 FT BUFFER OCCUPIED STRUCTURE WITH 250' BUFFER (N.T.S.) MEADE CO. PLAN RESUBMITTAL 2 10-18-2021 WATER/OIL WELL WITH 25 FT BUFFER OVERHEAD TRANSMISSION LINE WITH 50 FT EASEMENT-SITE EXHIBIT C2.05 8 C2.06 MEADE COUNTY KEY MAP

NOT FOR CONSTRUCTION

Case No. 2020-00387

Green River Solar, LLC

BUDB 1 Affects 1



Case No. 2020-00387 Green River Solar, LLC NOT FOR CONSTRUCTION **LEGEND** 707 E. 3rd Ave. New Smyrna Beach, FL, 32169 Phone: (386) 427-0694 www.ectinc.com - PARCEL SETBACK RAWLAND E. EVANS SR. & MARY K. WILHAM (DEED BOOK 428, PAGE 080) -50 FT PARCEL SETBACK -590 FT VISUAL SCREEN NEXT**ERA** ENERGY 🐼 SURFACE WATERS ALLEN HICKS (DEED BOOK 677, PAGE 43) WETLANDS **GREEN RIVER SOLAR MEADE COUNTY,** SOLAR ARRAY **KENTUCKY** SECURITY FENCE OVERHEAD TRANSMISSION LINE WIRTH 50 FT EASEMENT CT PROJECT No.: 20-0594 INVERTER -10' WIDE ACCESS ROAD NextEra Energy, Ir SIGNED BY: MRA RAWN BY: PROPOSED ROAD HECKED BY: TBD PROVED BY: VISUAL SCREEN ONCEPT PLAN 06-25-2021 Y SITING BOARD 07-09-2021 MEADE CO. PLAN 07-13-2021 UNOCCUPIED STRUCTURE WITH 20' BUFFER MEADE CO. PLAN RESUBMITTAL 1 09-22-2021 Y SITING BOARD OCCUPIED STRUCTURE WITH 250' BUFFER (N.T.S.) 10-18-2021 MEADE CO. PLAN RESUBMITTAL 2 8 WATER/OIL WELL WITH 25 FT BUFFER -SOLAR PANELS -WETLANDS WITH 25 FT BUFFER TBD BRIAN HAAG & JONATHON W. THOMAS (DEED BOOK 616, PAGE 025) INVERTER 470 FT VISUAL SCREEN SITE EXHIBIT C2.05 C2.06 SEE SHEET C2.08 SEE SHEET C2.08 SEE SHEET C2.10 PAGE 540) SLIDE 321) SEE SHEET C2.07 C2.08 MEADE COUNTY KEY MAP

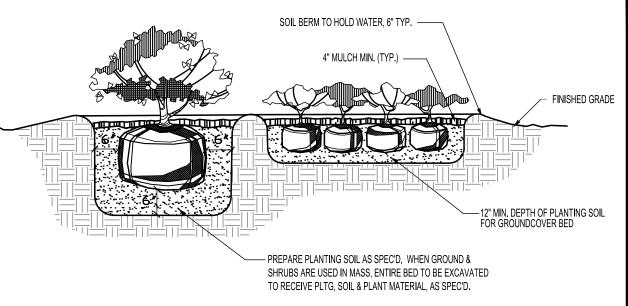
**NOT TO SCALE** 

C3.01

**NOT TO SCALE** 

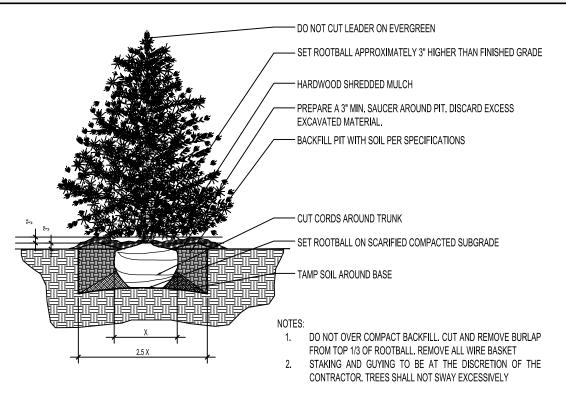
Case No. 2020-00387 Green River Solar, LLC NOT FOR CONSTRUCTION





NOTE: CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING PITS / BEDS PRIOR TO INSTALLATION

## SHRUB AND GROUNDCOVER DETAIL



## **EVERGREEN PLANTING DETAIL**

Table 1. Potential Evergreen and Deciduous Species Utilized by the Proposed Project

Туре	Species	Scientific Name
	White Pine	Pinus strobus
	Virginia Pine	Pinus virginiana
Coniferous Trees and Shrubs	Red Cedar	Juniperus virginiana
	Common Juniper*	Juniperus communis
	Eastern Hemlock	Tsunga canadensis
	Serviceberry	Amelanchier spp.
	Dogwood	Cornus spp.
	Winterberry	llex spp.
Proadlant Small Trace and Shrubs	Chokecherry	Prunus virginiana
Broadleaf Small Trees and Shrubs	Ninebark	Physocarpus opulifolius
	Sumac	Rhus spp.
	Viburnum	Viburnum spp.
	Redbud	Cercis canadensis

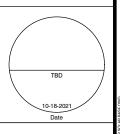
<sup>\*</sup> an upright growing habitat cultivar



NEXT**ERA** ENERGY 🐼

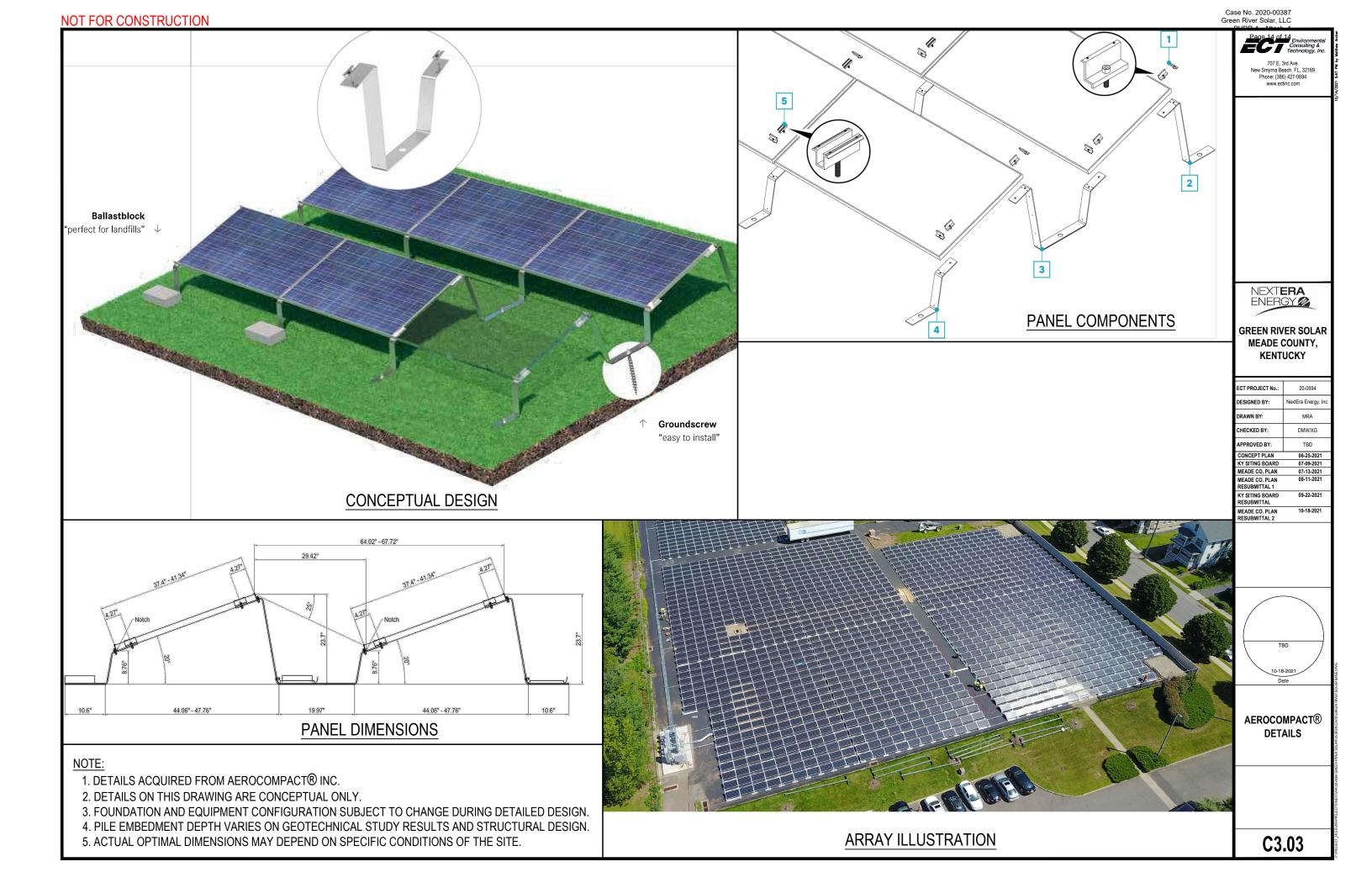
### **GREEN RIVER SOLAR** MEADE COUNTY, **KENTUCKY**

ECT PROJECT No.:	20-0594
DESIGNED BY:	NextEra Energy, Inc.
DRAWN BY:	MRA
CHECKED BY:	DMW/XG
APPROVED BY:	TBD
CONCEPT PLAN	06-25-2021
KY SITING BOARD	07-09-2021
MEADE CO. PLAN	07-13-2021
MEADE CO. PLAN RESUBMITTAL 1	08-11-2021
KY SITING BOARD RESUBMITTAL	09-22-2021
MEADE CO. PLAN RESUBMITTAL 2	10-18-2021



LANDSCAPE ILLUSTRATION

C3.02



### GREEN RIVER SOLAR, LLC

### CASE NO. 2020-00387

### RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

**POST-HEARING REQUEST** 

**RESPONSIBLE PARTY: Lina Jensen** 

Provide any reports prepared by Green River Solar's geotechnical Request 2. consultants identifying, delineating, or categorizing the known sinkholes and depressions present on the proposed Project site.

Response 2.

Please see Attachment 2 for the Karst Feature Survey and Assessment Report prepared by Terracon, geotechnical consultants retained on behalf of Green River Solar.

The conclusions of the Terracon report, as found on page 21 of Attachment 2, recommend avoiding moderate to very high risk karst features.

Project design and layout will be finalized during the detailed design phase. Currently, the Project is evaluating the potential avoidance of high and very high risk karst features.

Please note that due to the size of the file, Attachment 2 is being filed separately and in pieces.

### **GREEN RIVER SOLAR, LLC**

### CASE NO. 2020-00387

### RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

**POST-HEARING REQUEST** 

**RESPONSIBLE PARTY: Lina Jensen** 

Provide any reports or documentation that explains the proposed reverse Request 3.

grade filter method for remediation over low-risk sinkholes.

Response 3.

Please see Attachment 3 for Karst Aquifer Conservation Methods Summary prepared by Terracon,

geotechnical consultants retained on behalf of Green River Solar. This report was prepared in

response to a request for additional detail on options for remediation methods for low to moderate

risk karst features.

The Project has not finalized the specific remediation methods anticipated to be used to remediate

low to moderate risk karst features.



November 15, 2021

NextEra Energy Resources 1105 Navasota Street Suite 201 Austin, TX 78702

Attn: Mr. Matt Towery, P.E.

P: (561) 691-2249

E: matt.towery@nexteraenergy.com

Re: Karst Aquifer Conservation Methods Summary

Green River Solar

Meade and Breckenridge Counties, Kentucky

Terracon Project No. JD215085

Dear Mr. Towery:

As requested, Terracon Consultants, Inc. (Terracon) is submitting this letter summarizing the standard practice methods that will be used to protect the water quality of the karst aquifer by avoidance, buffering and remediation of the karst features at the proposed Green River Solar site located in Meade and Breckenridge Counties, Kentucky.

### 1.0 PROJECT INFORMATION

We understand the project is assessing the feasibility of constructing a solar facility located on a series of parcels in Meade and Breckenridge Counties, Kentucky. The proposed sites encompass approximately 1,945 acres and an additional 1,890 acres under consideration, for a total of 3,835 acres. All of the parcels are mapped as underlain by soluble carbonate bedrock forming a regional karst terrain (i.e. a landscape characterized by the presence of sinkholes, caves, sinking and losing streams, and a highly irregular "pinnacled" overburden/bedrock interface).

### 2.0 PROTECTION OF THE KARST AQUIFER

In areas where the karst terrain is present, both municipalities and private landowners are often completely dependent on the karst aquifer as their source of potable water. This water is provided by wells and springs seated in the phreatic (perennial) karst aquifer. In the past, poor control of stormwater, sewage effluent, and chemical contaminants has rendered the water in the karst aquifer unusable for human or animal consumption, and poses a distinct risk to the environment in general. Thus, methods have been developed over the years to minimize the impact of karst aquifer contamination to human health and the environment. The greatest impact to the aquifer is typically caused by the uncontrolled flow of water into "open throat" sinkholes (often called dolines), where surface water can plunge directly into the epikarst, eventually flowing downward into the vadose zone which ultimately provides recharge to the underlying phreatic aquifer (Figure 1).

Terracon Consultants, Inc. 19955 Highland Vista Drive Ashburn, Virginia 20147 P [703] 726 8030 terracon.com

Environmental

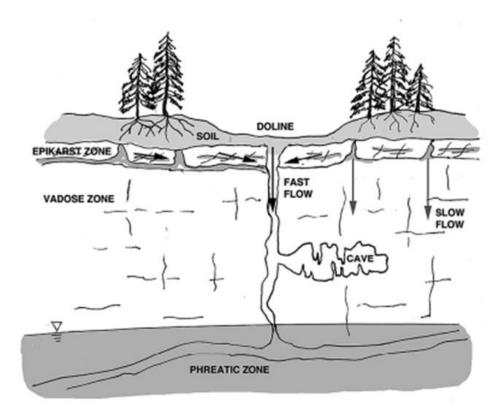
**Facilities** 

Geotechnical

Materials

**Karst Aguifer Conservation Methods Summary** 

Green River Solar ■ Meade and Breckenridge Counties, Kentucky November 15, 2021 ■ Terracon Project No. JD215085



**Figure 1.** In karst terrain, the principle subsurface horizons are the "epikarst" and underlying "karst" strata. The *epi*karst (epi = "above" or "upon the karst") is formally defined as the stratum between the topsoil and the mostly unweathered bedrock lying below, and consists of a heterogeneous combination of subsoil often mixed with rock "rubble", disconnected boulders (sometimes called "float"), and highly weathered and solution modified bedrock. The "karst" strata consist of the vadose zone, and the permanently water-filled phreatic zone. Depending on the seasonal precipitation, the interface between the vadose and phreatic changes as the water table rises and falls.

Because the carbonate bedrock in which karst conduits exist has no inherent filtration properties, any water flowing into it will carry contaminants in an unaltered state directly into the aquifer. These contaminants are usually carried as a residual phase adsorbed to the surface of sediment particles, or as dissolved phase and/or free-phase chemical contaminants. In addition, sewage effluent originating from poorly designed or malfunctioning septic drainfields can also discharge into the epikarst, and ultimately impact the underlying aquifer.

Often, the greatest potential for impact to the karst aquifer is a result of poorly planned or managed sediment and erosion control of sites under development and construction including solar energy "farms", and if not properly managed these effects can even persist for the life of the facility. Thus, specific avoidance, minimization and remediation measures (AMMs) have been developed in recent years to minimize the impacts of construction on the karst aquifer, and safeguard water quality. The AMM standard practices which are recommended for use at the Green River Solar Site are summarized in the following sections.

Case No. 2020-00387 Green River Solar, LLC PHDR-1 - Attach. 3 Page 3 of 14

#### Karst Aguifer Conservation Methods Summary

Green River Solar ■ Meade and Breckenridge Counties, Kentucky November 15, 2021 ■ Terracon Project No. JD215085

### 3.0 AVOIDANCE AND BUFFERING

Referencing the karst survey and assessment report for the Green River Solar Site, the identified karst features (primarily sinkholes) have been risk ranked based on a set of characteristics observed and documented during the field survey. For very high risk features which include sinkholes with open throats, active soil raveling (suggesting continued sinkholes growth and expansion) and a drainage channel, the preferred treatment will be avoidance and buffering. This includes both sinkholes located within the proposed limits of construction disturbance (LOD), and any features which receive drainage from the LOD.

The preferred option is to avoid all karst features, if possible, since every feature brings a variable amount of risk to both the project infrastructure and the karst aquifer. In addition, avoidance preserves the vegetated buffer, especially for features which have reached equilibrium, naturally. For this avoidance scenario, we recommend a minimum buffer of 25 feet which should remain in an undisturbed natural state¹ through all periods of construction and subsequent facility operations. In addition, a 150-foot buffer should be established around each karst feature during construction where vehicles may not be refueled, and stockpiles of equipment or fuel should not be stored. The 150-foot buffer may need to be extended or modified if a significant drainage area has been delineated outside of an open throat feature. This does not mean construction is prohibited within this buffer, only that certain construction related activities, primarily including the storage of fuel and equipment, should not occur within this area.

It should be noted that the 25-foot vegetated buffer follows the USDA-NRCS Conservation Practice Standard "Karst Sinkhole Treatment" Code 527 (Appendix A). In addition, during construction all features should derive additional protection by the installation of appropriate sediment and erosion control structures which should remain in place until the site is fully developed and revegetated.

### 4.0 REMEDIATION

The standard practice for remediating sinkholes which has been used widely since the late 1970s is known as the "reverse grade filter" or "inverse aggregate graded filter". This approach has supplanted the widespread use of grout to fill sinkholes, which was once thought to be the most efficient way to remediate a sinkhole. However, it was discovered that filling an open throat sinkhole with grout often cause the formation of other sinkholes in the surrounding area, as soil

<sup>&</sup>lt;sup>1</sup>An "Undisturbed Natural State" is defined for the purpose of karst conservation as not causing any disturbance to the natural vegetation and soils within the 25-foot buffer of a karst feature. This would include (but not be limited to) activities such as cutting, trimming, stripping and grubbing, grading, use of herbicides and/or insecticides, application of fertilizers or soil amendments, and depositing vegetation cuttings or trash of any kind.

<sup>&</sup>lt;sup>2</sup>Reitz, H.M., and Eskridge, D.S., 1977, Construction methods which recognize the mechanics of sinkhole development, in Dilamarter, R.R., and Csallany, S.C., eds., Hydrologic problems in karst regions: Bowling Green, Western Kentucky University, Department of Geology and Geography, p. 432-438.

Sowers, G.F., 1996, Building on sinkholes: Design and construction of foundations in karst terrain: American Society of Civil Engineers, p. 115.

### **Karst Aquifer Conservation Methods Summary**

Green River Solar ■ Meade and Breckenridge Counties, Kentucky November 15, 2021 ■ Terracon Project No. JD215085

began to ravel down conduits leading to the surface which extended from the now grouted structure. At the Green River site, the reverse graded filter is the recommended approach for the majority of sinkholes.

The reverse graded filter essentially allows the continued flow of water into the subsurface, but limits the water from carrying soil particles with it. It's important to note that most sinkholes form "from below" when a void migrates up through the soil from a cavernous opening in the underlying bedrock. Eventually, the soil arch above the void will fail, forming the sinkholes. If the soils are cohesive (clays) the failure can be rapid, forming a "cover collapse" sinkhole. If the soils are granular (sandy/silty) the collapse will happen more slowly as the sediment ravels into the opening below. In either case, it is the movement of soil, not the dissolution of the underlying limestone, that causes a sinkhole to form. The stripping and grubbing of vegetation from a site can accelerate the formation of sinkholes, as the overlying soil arch strength is reduced due to the lack of roots from the vegetation holding the arch together.

Thus, the reverse graded filter (Figure 2) consists of placing boulders or slabs of rock wider than half the throat diameter to form an arch across the bottom opening.

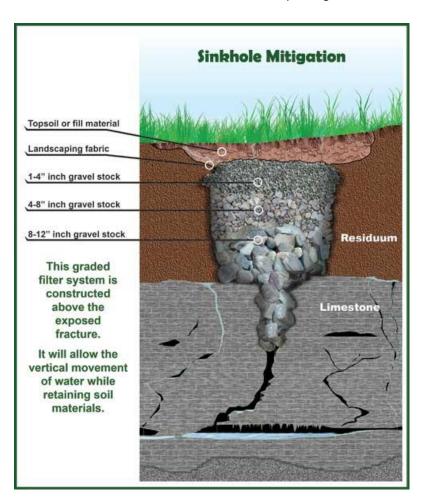


Figure 2. Cross-section of a stylized version of the reverse graded filter. (Courtesy of the Missouri Geological Survey)



**Karst Aguifer Conservation Methods Summary** 

Green River Solar ■ Meade and Breckenridge Counties, Kentucky November 15, 2021 ■ Terracon Project No. JD215085

Successive layers of rock are then placed which are sized finer than the underlying layer, but large enough not to fill the interstices between the rocks in the underlying layer. The uppermost layer is then capped with geotextile fabric, usually a micro-perforated non-woven material. Uncompacted soil lifts are then placed above the fabric. It is often recommended to fill the soil slightly higher than the grade surrounding the excavation, to allow for settling as the soil compacts. The soil should be planted with the same turf used for the solar field.

The goal of the reverse graded filter is to allow surface soils to be retained and prevented from raveling into the subsurface. This will allow the water to flow through the epikarst, into the gravel filter, and downward into the underlying vadose and phreatic zones. Thus, contaminants are effectively mitigated by the action of soil organisms, and not carried down into the underlying aquifer.

For sinkholes that receive active surface drainage (i.e. swallets), have drainage channels, or a large recharge area, specialized types of remediation are often required. Drawing details of the standard reverse graded filter, and some of the alternate remedial methods, are included in Appendix B. For instance, in situations where there is a drainage channel or active flow to a structure (i.e. a sinking stream or swallet), it is best to completely avoid the structure and buffer it. However, the choice of remedial approach is always determined on a case by case basis, with an ultimate goal to protect the integrity of the karst groundwater aquifer.

### 5.0 CLOSURE

The information presented herein has been based on the review of both proprietary and publicly available geologic information. However, it should be noted that karst is a dynamic landform and significant changes can occur over time. Features identified in the data review must be verified and evaluated in the field to be definitively characterized as karst landforms.

Terracon has conducted these services in accordance with generally accepted geologic practices. No warranties, either expressed or implied, are made as to the professional services and recommendations presented herein.

Sincerely,

**Terracon Consultants, Inc.** 

Robert K. Denton Jr., CPG, LPSS Project Geologist

Benjamin W. Taylor, PE, PG Principal, Regional Manager



Karst Aquifer Conservation Methods Summary

Green River Solar • Meade and Breckenridge Counties, Kentucky November 15, 2021 • Terracon Project No. JD215085

Appendices: Appendix A – USDA-NRCS Conservation Practice Standard Code 527

Appendix B – Sinkhole Remediation Drawing Details

Case No. 2020-00387 Green River Solar, LLC PHDR-1 - Attach. 3 Page 7 of 14

# APPENDIX A USDA-NRCS Standard Practice Code 527

### **CONSERVATION PRACTICE STANDARD**

### SINKHOLE AND SINKHOLE AREA TREATMENT

(Acre)

### **CODE 527**

### **DEFINITION**

A method of treating sinkholes and sinkhole areas to reduce contamination of ground water resources, and/or improve farm safety.

### **PURPOSE**

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Improve water quality
- Improve chemical and nutrient management within sinkhole watersheds
- Reduce soil erosion within sinkhole watersheds
- Improve farm safety

### **CONDITIONS WHERE PRACTICE APPLIES**

On any agricultural land surface or existing practice where the soils and geologic conditions have led to the development of sinkholes. Also where contaminated surface water and other material have the opportunity to enter sinkholes and pollute the ground water resource.

#### **CRITERIA**

### **General Criteria Applicable To All Purposes**

The installation and operation of sinkhole treatment(s) will comply with all federal, state, and local laws, rules, and regulations.

Provide for public safety in and around sinkholes.

Trash and other material will be removed from the sinkhole and disposed of in an environmentally sound manner, as directed in conservation practice standard Obstruction Removal (PA-500).

Excess surface water caused by construction activities will be diverted from the sinkhole area.

Nutrient and pest management plans will be developed for the drainage area of the sinkhole controlled by the landowner.

### <u>Additional Criteria Relating for Treatment of</u> Sinkholes

Adequate protection of some sinkhole and sinkhole areas can be achieved by the use of vegetated buffers and livestock exclusion. However, if an open sinkhole is a safety hazard, it should be treated with a rock filter, earth fill, or other methods approved by the State Conservation Engineer.

Sinkholes that open into caves shall not be filled unless bat-friendly openings are provided. Gated openings may be used for safety reasons.

Sinkholes that serve as outlets for karst basins should only be protected by use of filter strips, riparian forest buffers, fencing, and other similar practices.

**Sinkhole Closing.** Standard Drawings NRCS PA-073, PA-074, and PA-075 provide guidance for designing a pervious cover, soil cover, and an impervious cover, respectively, for sinkholes. These drawings may be adequate for many situations, however special conditions may require a site-specific design.

**Vegetative Treatment.** All sinkholes treated with a vegetated treatment shall have a vegetated buffer, minimum of 25 feet wide, measured from the rim of the sinkhole. The buffer area should be extended to control concentrated flow channels entering the sinkhole. The width of the vegetated buffer will

be established and maintained in accordance with the type of buffer chosen. The sinkhole and surrounding buffer shall be fenced.

Livestock will be excluded from the vegetated buffer except where applicable for maintenance purposes.

Nutrients, herbicides, pesticides, and animal waste will not be applied within an established buffer. Only mechanical treatments shall be used for weed control.

Appropriate erosion and sediment control measures will be used to reduce the amount of sediment entering sinkhole openings during the establishment of the vegetated buffer.

## Additional Criteria for Surface Water Control

Changes to the volume of surface water that enters a sinkhole may disturb the underground hydrology. To the extent possible, the surface water flow should be maintained at historic (or predevelopment) volumes.

Perennial flow channels will be stabilized but should not otherwise be altered. If a plug or inverted filter is used for perennial flow channels, the area to be protected should be characterized by a qualified geologist.

Concentrated flow caused by the construction activities will be dispersed with a suitable spreading structure.

## Additional Criteria for the Establishment of Vegetation

On disturbed areas and/or sinkholes (as applicable), determine the appropriate vegetation to be established based on site conditions and planned land use. Follow the conservation practice standards for Conservation Cover (PA-327), Critical Area Planting (PA-342), Riparian Herbaceous Cover (PA-390), Riparian Forest Buffer (PA-391), or Pasture and Hay Planting (PA-512), as appropriate.

When a grassed filter area is required around the sinkhole, follow the Filter Strip Standard and Specification (PA-393).

Do not use plants listed on the Pennsylvania noxious weed list. Schedule construction so that completion occurs during periods suitable for the establishment of vegetation.

### **CONSIDERATIONS**

The practice should work in conjunction with conservation cropping systems, pest and nutrient management, and practices that control sheet, rill and gully erosion.

Current and planned land use should be considered. In particular, structures, septic fields, wells, feedlots, ponds, and animal waste storage systems should not be located over a sinkhole site or within the impact area.

The sinkhole treatment should not result in surface water ponding or high soil moisture conditions over an extended period of time.

The treatment should be planned with consideration given to the following:

- Land use
- Existing and planned land treatment.
- Sinkhole drainage area.
- Dimensions of sinkhole opening.
- Safe outlet for diverted surface water.
- Environmentally safe disposal site for sinkhole "cleanout" material.
- Availability and quantity of inverted filter material.
- Safety of equipment operators and laborers during practice installation.

Caution should be taken when working around or operating equipment near the rims of active unstable sinkholes.

For a sinkhole receiving contaminated overland flow, every effort should be made to first treat the source of contamination.

Although it is important to maintain the hydrology of the karst system, it may be more beneficial to the ground water quality to divert the contaminated water away from the sinkhole. When diversion of contaminated water is impractical, it may be necessary to completely plug a sinkhole with sealing materials rather than treat it with a filter. The contaminated water could then be treated. An example of this would be a sinkhole in a feedlot or other site that is difficult to protect by any other method.

Treatment of one sinkhole may have an effect on other sinkholes or solution features in the vicinity.

The use of a Conservation Easement for the buffer and sinkhole should be considered.

### PLANS AND SPECIFICATIONS

Plans and specifications for Sinkhole and Sinkhole Area Treatment will be in keeping with this standard and will describe the requirements for applying the practice to achieve its intended purpose.

- Plan view showing sinkhole and sinkhole area. Include topographic information and photographs.
- The geologic investigation will include a study on the potential impacts on the karst resource (if needed).
- Delineated drainage area of the sinkhole on a topographic map.
- Planned treatment measures.
- Availability of safe outlet for surface water, if applicable.
- Operation and Maintenance requirements.
- Special safety requirements.
- Environmental Assessment, if applicable.

### **OPERATION AND MAINTENANCE**

An operation and maintenance (O&M) plan shall provide specific instructions for maintaining the sinkhole and sinkhole area treatment, including reference to periodic inspections and the prompt repair and/or replacement of damaged components.

At a minimum, the following items shall be included in the O & M plan, as applicable:

- Inspection of the treatment should be made after periods of heavy runoff, since some material may run further into the sinkhole voids causing a surface depression. In this case, maintenance will include adding soil material to the surface.
- 2. Appurtenances such as filter strips, diversions, structures, and other

- conveyance systems shall be kept free of trash and repaired when needed.
- 3. Mow herbaceous plantings as necessary to promote vigorous growth.
- 4. If fences are installed, they should be maintained to prevent unauthorized entry.
- Maintain all safety practices associated with sinkholes.

### **REFERECES**

Koerner, R.M. Designing with Geosynthetics, Prentice-Hall, Englewood Cliffs, NJ, 1985.

National Crushed Stone Association. Graded Riprap Stone, Quarried Stone for Erosion and Sediment Control. June 1978

USDA-NRCS. Estimating Runoff and Peak Discharges, Engineering Field Handbook, Chapter 2, August 1987.

USDA-NRCS. Geology, National Engineering Handbook, Part 531, Section 8, Chapter 1, 1978.

USDA-NRCS. Geology, National Engineering Handbook, Part 531.21, September 1999.

USDA-NRCS. Field Office Technical Guide (eFOTG), Section IV.

USDA-NRCS. Urban Hydrology for Small Watersheds, Technical Release 55, June 1986.

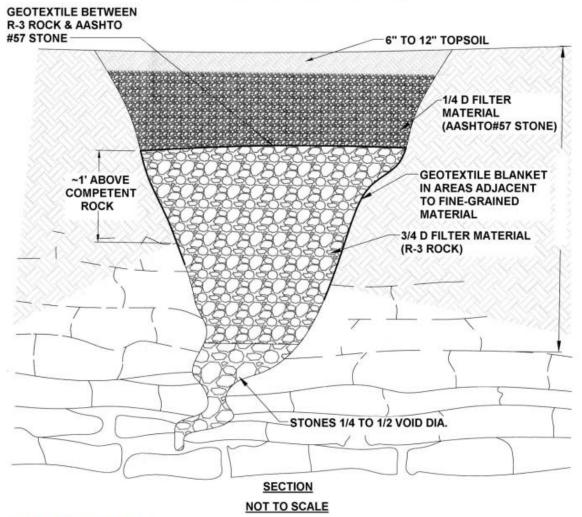
White, W.B. Geomorphology and Hydrology of Karst Terrains, Oxford University Press, Inc., New York, NY. 1988.

PATG Section IV Pennsylvania August 2008

Case No. 2020-00387 Green River Solar, LLC PHDR-1 - Attach. 3 Page 11 of 14

# APPENDIX B Sinkhole Remediation Drawing Details

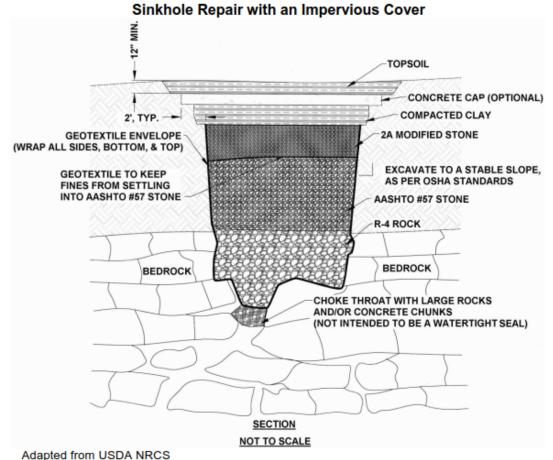
### Sinkhole Repair with a Pervious Cover



Adapted from USDA NRCS

Loose material shall be excavated from the sinkhole and expose solution void(s) if possible. Enlarge sinkhole if necessary to allow for installation of filter materials. OSHA regulations must be followed at all times during excavation.

Stones used for the "bridge" and filters shall have a moderately hard rock strength and be resistant to abrasion and degradation. Shale and similar soft and/or non-durable rock are not acceptable.



Loose material shall be excavated from the sinkhole and expose solution void(s) if possible. Enlarge sinkhole if necessary to allow for installation of filter materials. OSHA regulations must be followed at all times during excavation.

Geotextile shall be non-woven with a burst strength between 100 and 200 psi.

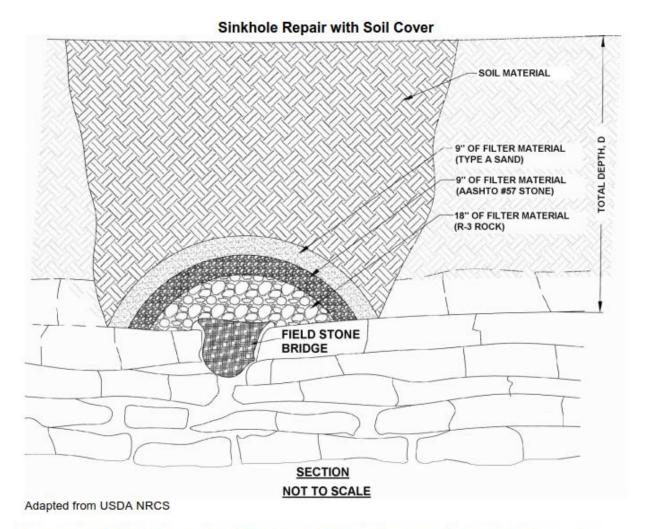
Select field stone(s) about 1.5 times larger than solution void(s) to form "bridge." Place rock(s) so no large openings exist along the sides. Stones used for the "bridge" and filters shall have a moderately hard rock strength and be resistant to abrasion and degradation. Shale and similar soft and/or non-durable rock are not acceptable.

Minimum thickness of R-4 rock is 18." AASHTO #57 stone thickness shall be  $\frac{1}{4}$  to  $\frac{1}{2}$  that of the R-4 rock. Minimum thickness of 2A modified crushed stone shall be 9". AASHTO #57 stone and 2A modified crushed stone shall be compacted after each placement.

Compacted clay seal shall be a minimum of 12" thick. Clay shall be placed in 6" to 9" lifts and thoroughly compacted.

Concrete cap, which is optional, shall be a minimum of 8" thick. Use 4,000 psi concrete with 6" X 6" - 6 gauge welded wire fabric, or # 3 rebar on 18" O.C. both ways.

Topsoil shall be a minimum of 12" thick. Grade for positive drainage away from sinkhole area.



Loose material shall be excavated from the sinkhole and expose solution void(s) if possible. Enlarge sinkhole if necessary to allow for installation of filter materials. OSHA regulations must be followed at all times during excavation.

Select field stone(s) about 1.5 times larger than solution void(s) to form "bridge." Place rock(s) so no large openings exist along the sides. Stones used for the "bridge" and filters shall have a moderately hard rock strength and be resistant to abrasion and degradation. Shale and similar soft and/or non-durable rock are not acceptable.

Minimum thickness of R-3 rock is 18." AASHTO #57 stone thickness shall be a minimum of 9" thick. Minimum thickness of type A sand shall be 9". NOTE: A non-woven geotextile with a burst strength between 100 and 200 psi may be substituted for the AASHTO#57 stone and type A sand.

Soil shall be mineral soil with at least 12 % fines and overfilled by 5% to allow for settlement. Suitable soil from the excavation may be used. Any available topsoil shall be placed on top surface.

### **GREEN RIVER SOLAR, LLC**

### CASE NO. 2020-00387

### RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

**POST-HEARING REQUEST** 

**RESPONSIBLE PARTY: Lina Jensen** 

Request 4. Provide a copy of the Site Plan with updated and detailed proposed vegetative buffers. If any residences with direct view of solar facilities or equipment will have no vegetative buffering, explain why.

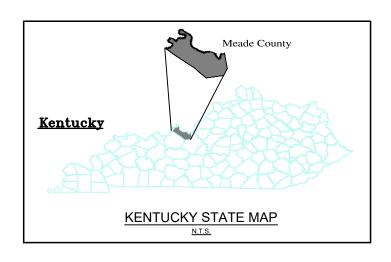
### Response 4.

Please see Attachment 4 for updated Conceptual Site Plan, including updates to proposed vegetative buffers. Vegetative buffers are planned for all residences with direct view of the solar facilities or equipment.

## **CONCEPTUAL SITE PLAN**

# GREEN RIVER SOLAR PROJECT

PREPARED FOR



SITE ADDRESS	TBD
COUNTY PARCEL NUMBER	VARIOUS
GPS COORDINATES	37.908° N, -86.261° W (PROJECT SUBSTATION)
SITE ELEVATION	680 FT A.M.S.L.
UTILITY NAME	TBD
UTILITY ADDRESS	TBD
UTILITY CONTACT INFORMATION	TBD
DEVELOPER NAME	GREEN RIVER SOLAR, LLC
DEVELOPER ADDRESS	700 UNIVERSE BLVD., JUNO BEACH, FI
DEVELOPER CONTACT	LINA JENSEN
CIVIL ENGINEER OF RECORD (EOR) NAME	TBD
CIVIL EOR ADDRESS	TBD
CIVIL EOR CONTACT INFORMATION	TBD
APPLICABLE BUILDING PERMIT AUTHORITY	TBD
SYSTEM SIZE (MW)	200 MW TOTAL
SYSTEM DC SIZE (MW)	TBD
TRANSFORMER COUNT	1
EQUIPMENT PAD COUNT	TBD
PROJECT ZONING	AGRICULTURAL
NON PARTICIPATING PARCEL BUFFER	50 FEET
OCCUPIED STRUCTURE BUFFER	250 FEET
ROAD R.O.W. BUFFER	25 FEET
SURFACE WATER BUFFER	25 FEET
WETLAND BUFFER	25 FEET
STREAM BUFFER	25 FEET
PROJECT AREA	1,750 ACRES
ROAD LENGTH	63,200 FEET
LANDSCAPE BUFFER	35,880 FEET

**ALTA SURVEY BY:** 



## **GREEN RIVER SOLAR, LLC** 700 UNIVERSE BLVD **JUNO BEACH, FL 33408**

Contact: Lina Jensen, Project Director NextEra Energy Resources (832) - 613 - 7247

**MEADE COUNTY, KENTUCKY**, 40146

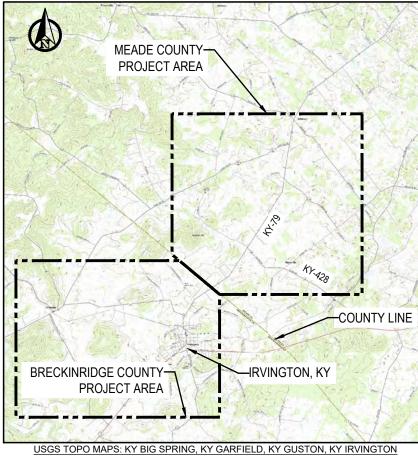
BY



707 East Third Avenue New Smyrna Beach, Florida 32169 Tel: (386) 427-0694 Fax: (386) 427-0889 Agent's E-mail: cfagerstrom@ectinc.com Agent's Tel: (386) 852-0387 http://www.ectinc.com

ECT PROJECT NUMBER 20-0594

**NOVEMBER 2021 KENTUCKY SITING BOARD REVIEW SET** 



## PROJECT LOCATION MAP

### INDEX OF DRAWINGS

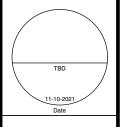
C1.00	COVER PAGE
C1.01	EXISTING CONDITIONS
C1.02	OVERALL SITE PLAN
C2.01 -	SITE EXHIBITS
C2.16	
C3.01	CONSTRUCTION DETAILS
C3.02	LANDSCAPE ILLUSTRATION
C3.03	AEROCOMPACT® DETAILS

New Smyrna Beach, FL, 32169 Phone: (386) 427-0694 www.ectinc.com

NEXT**ERA** ENERGY

### **GREEN RIVER SOLAR** MEADE COUNTY, **KENTUCKY**

ECT PROJECT No.:	20-0594
DESIGNED BY:	NextEra Energy, Inc.
DRAWN BY:	MRA
CHECKED BY:	DMW/XG
APPROVED BY:	TBD
CONCEPT PLAN	06-25-2021
KY SITING BOARD	07-09-2021
MEADE CO. PLAN	07-13-2021
MEADE CO. PLAN RESUBMITTAL 1	08-11-2021
KY SITING BOARD RESUBMITTAL	09-22-2021
MEADE CO. PLAN RESUBMITTAL 2	10-18-2021
KY SITING BOARD RESUBMITTAL	11-10-2021



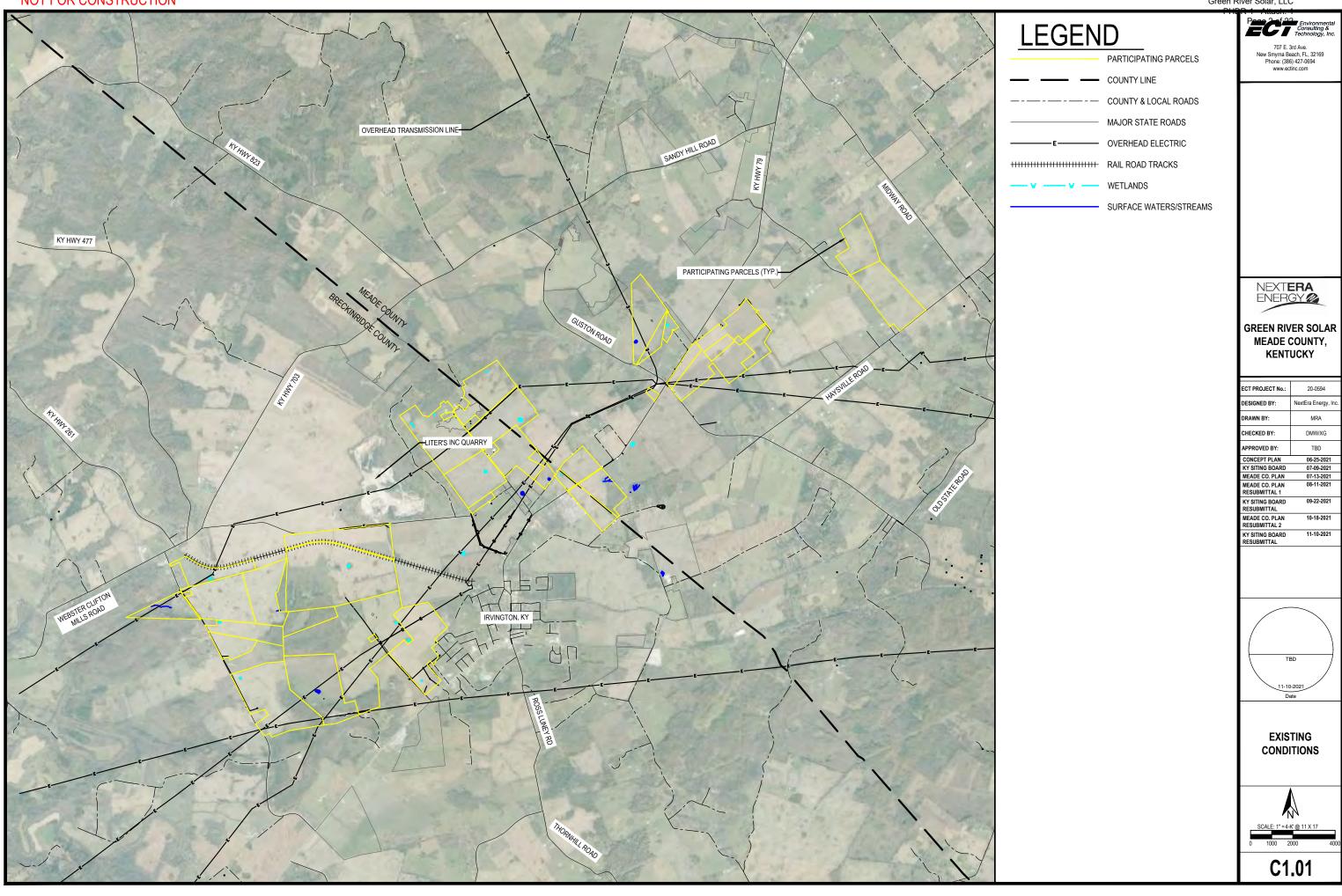
**COVER PAGE** 

C1.00

NOT FOR CONSTRUCTION

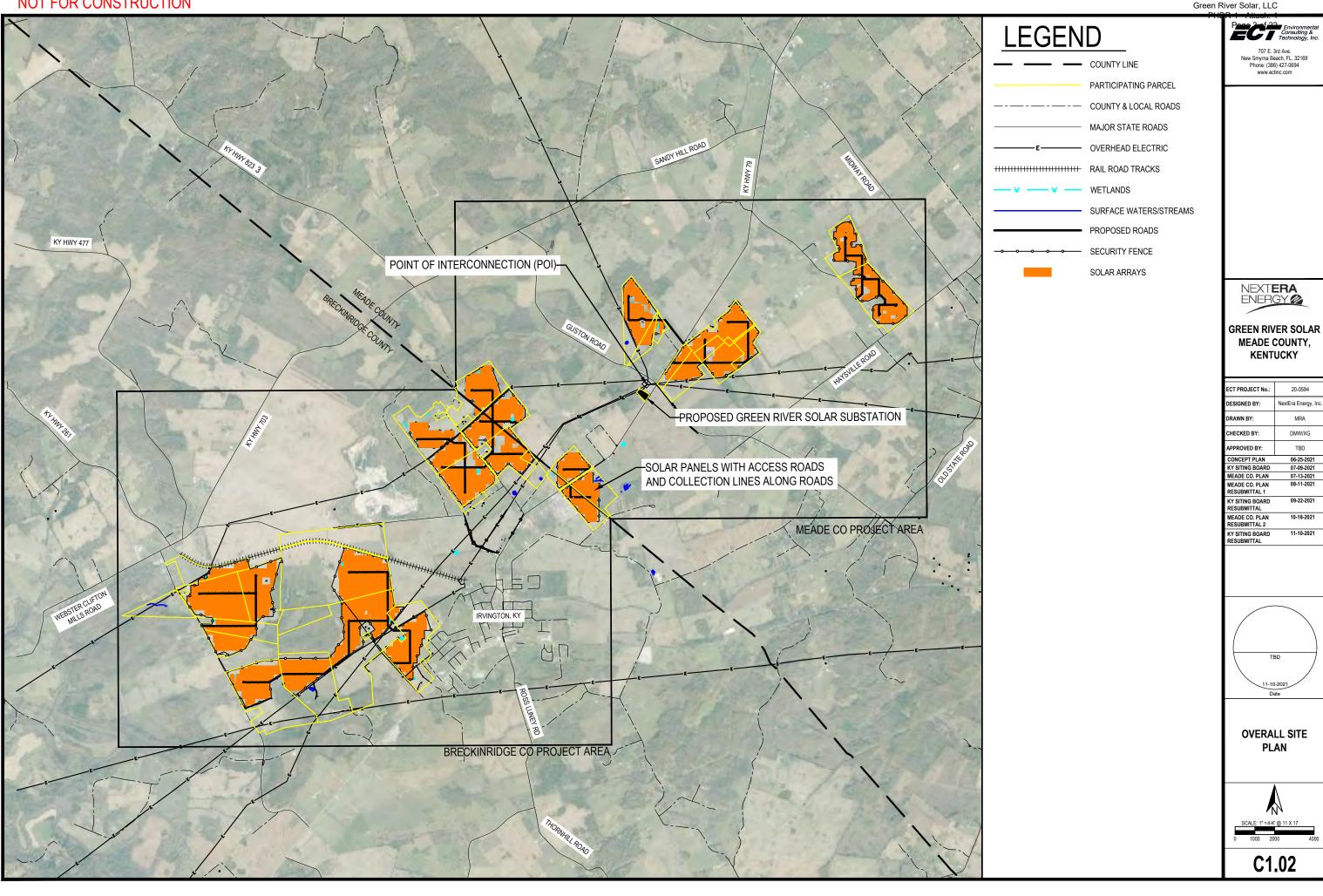
Case No. 2020-00387

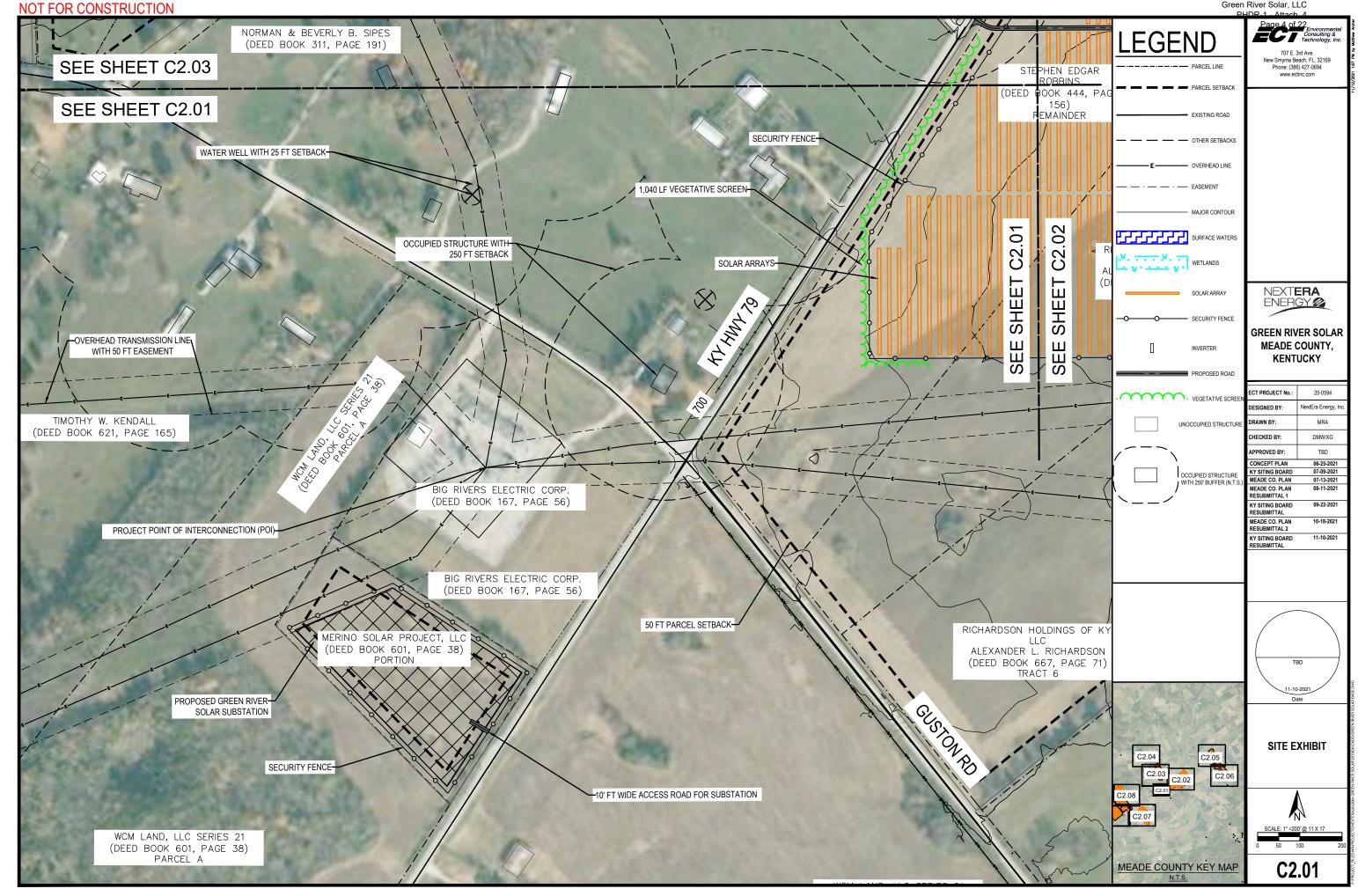
Green River Solar, LLC

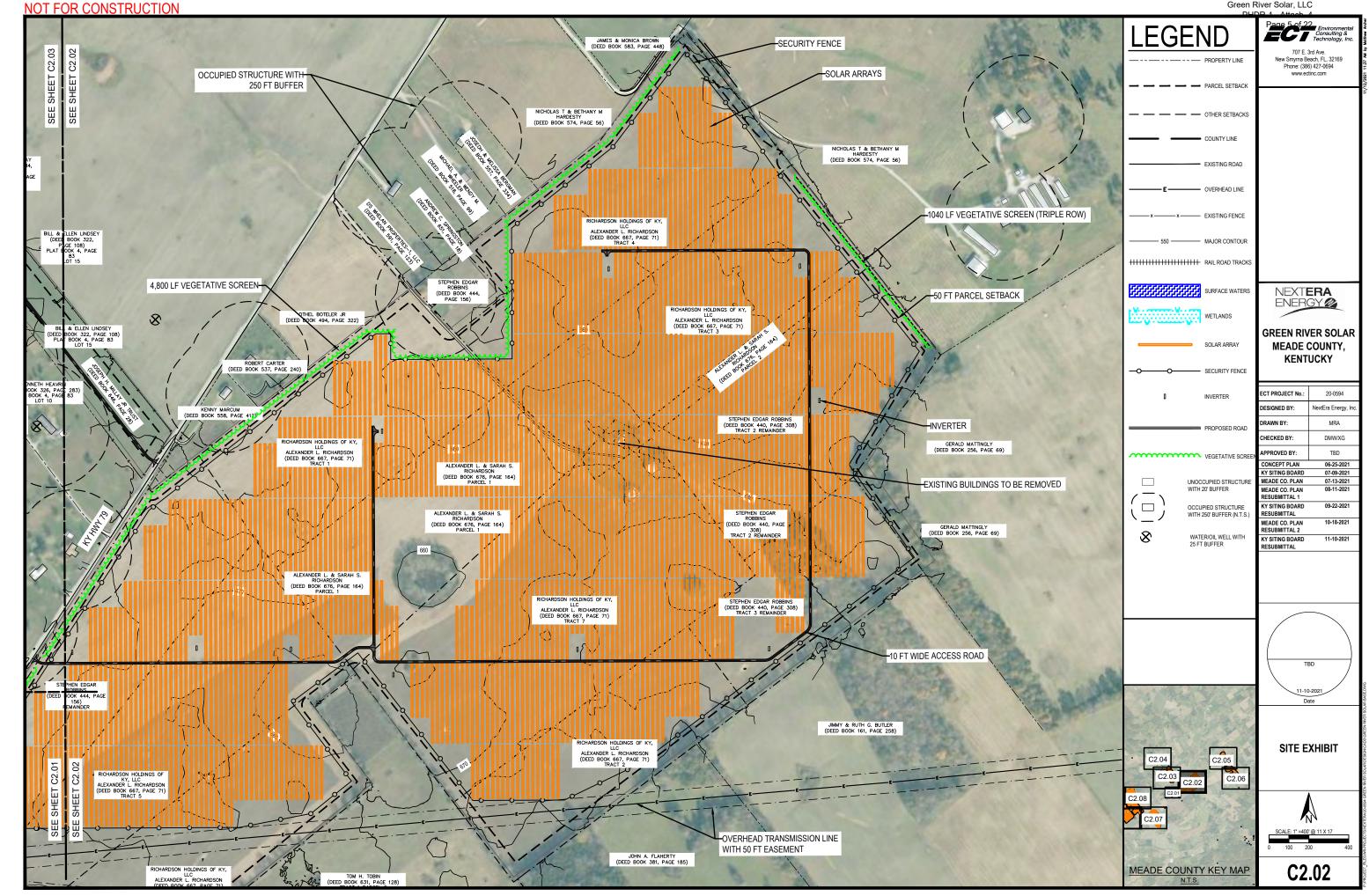


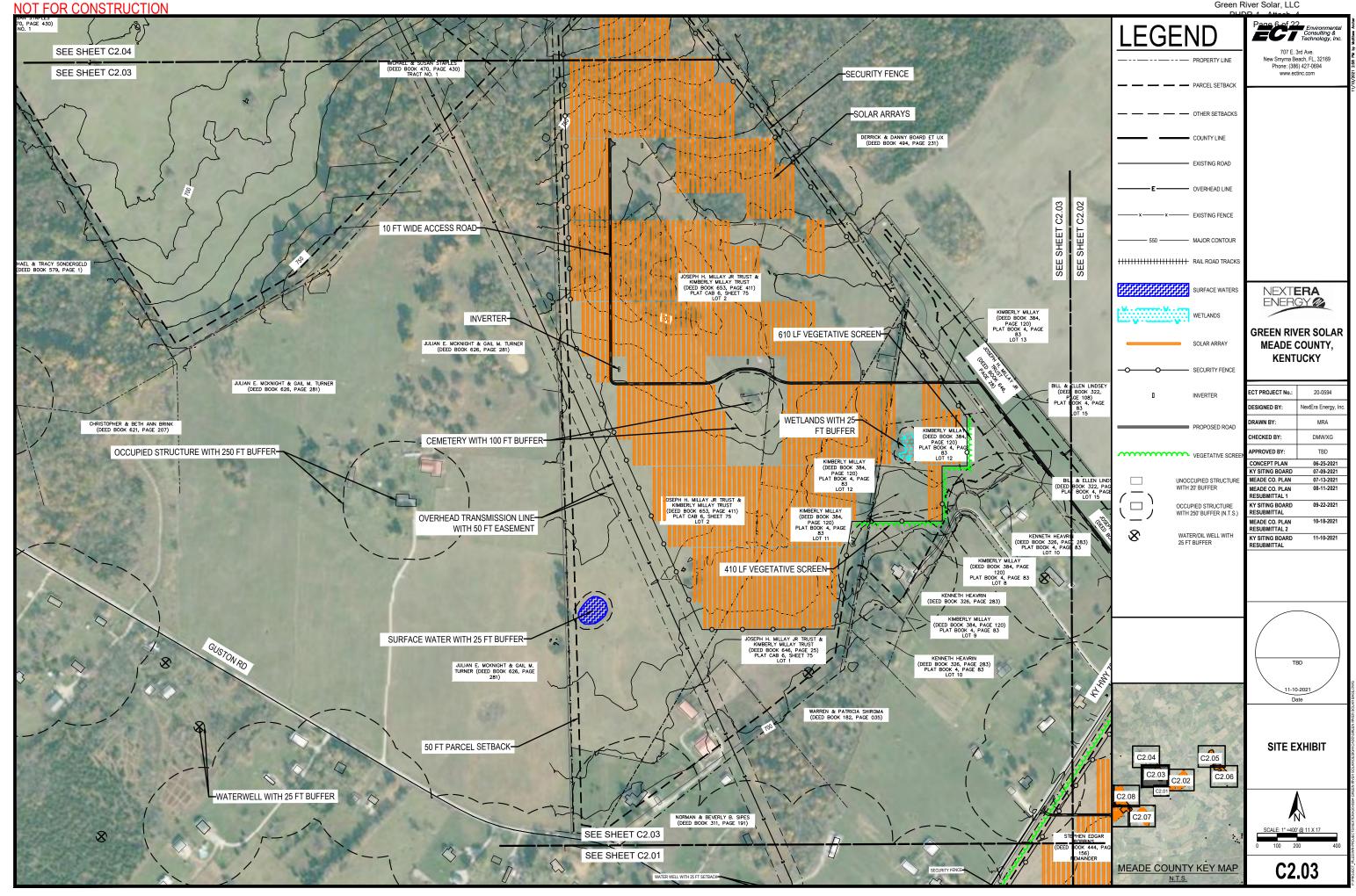
NOT FOR CONSTRUCTION

Case No. 2020-00387
Green River Solar, LLC

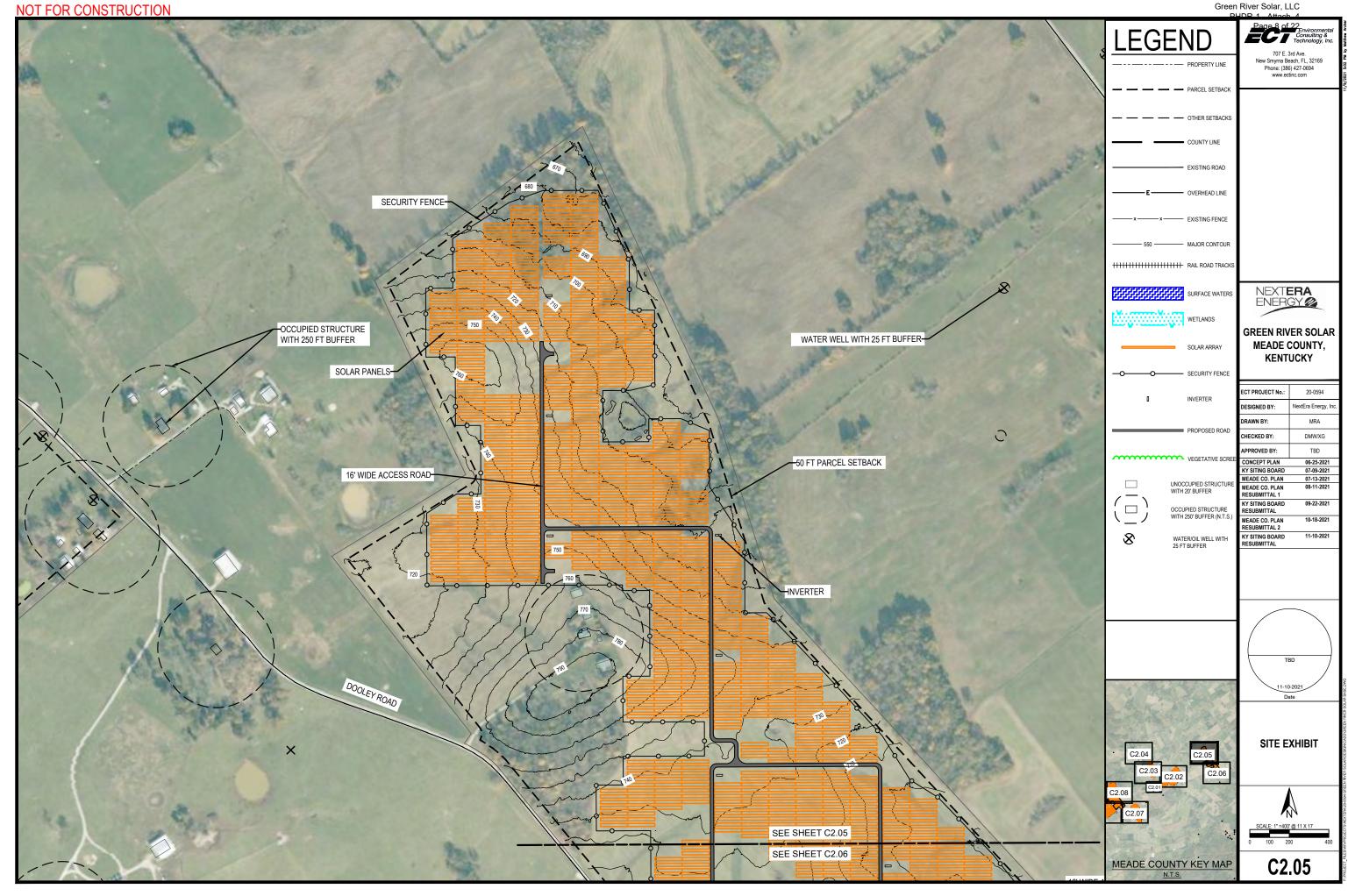


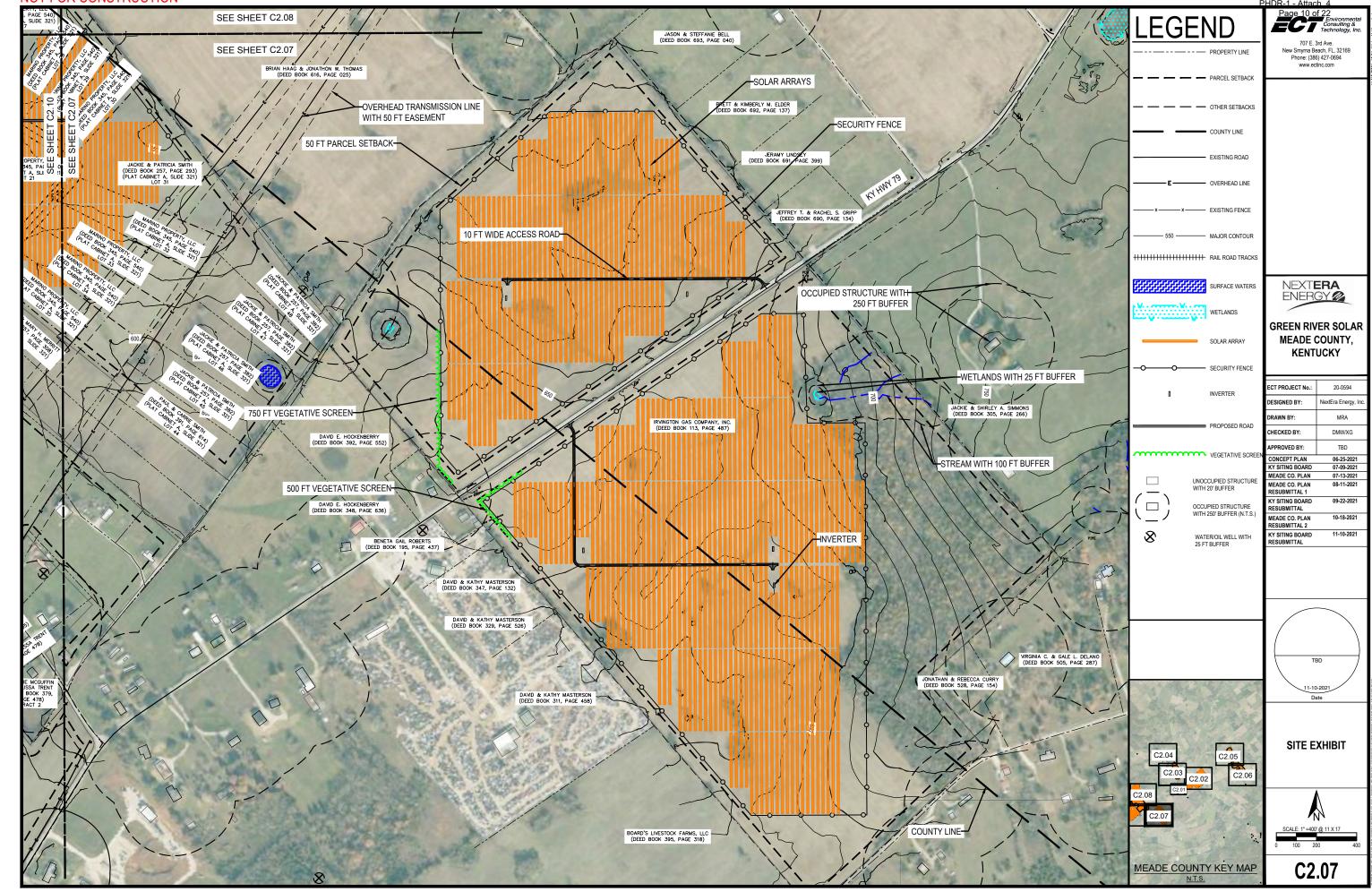




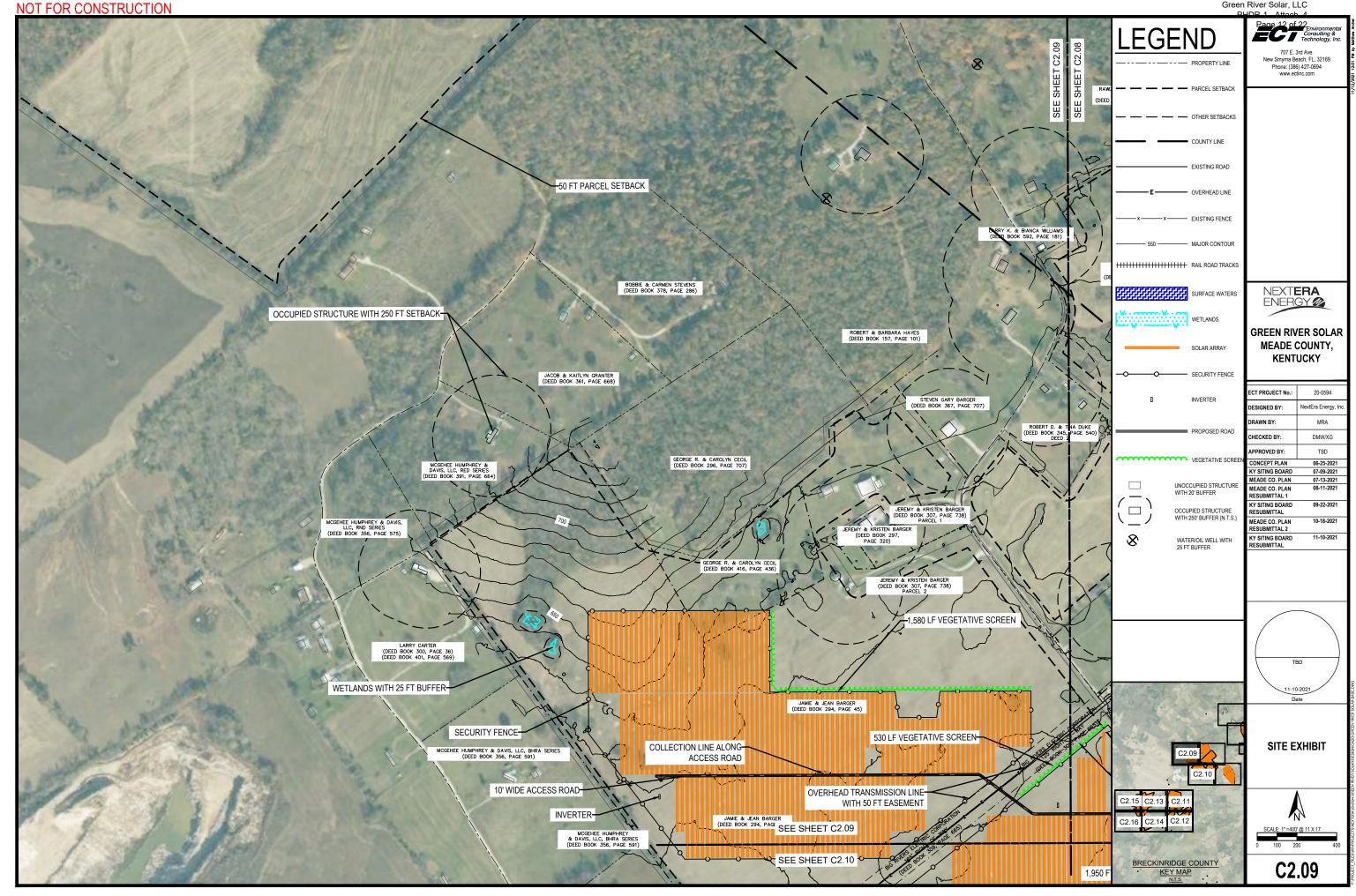


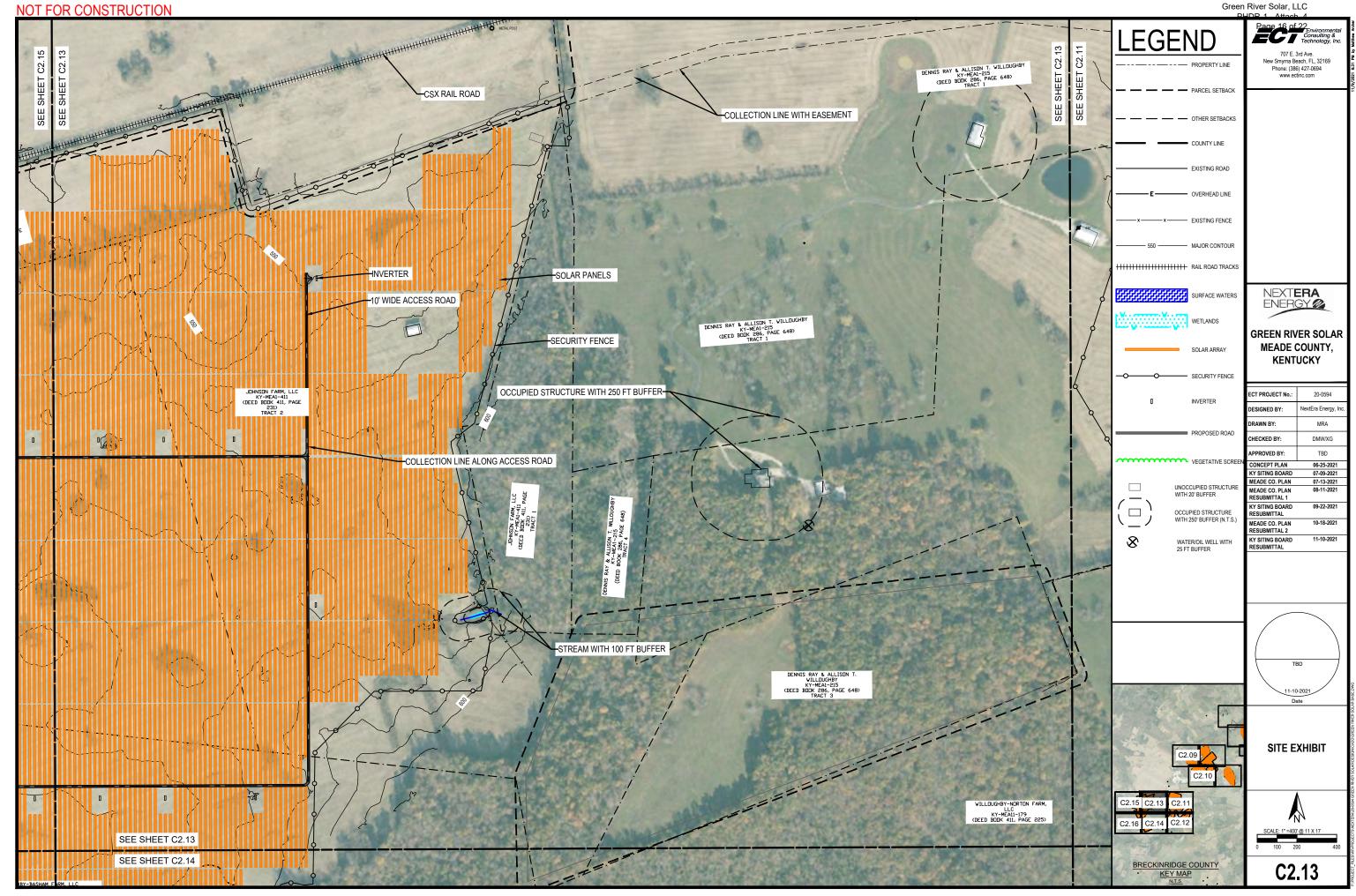
Case No. 2020-00387 Green River Solar, LLC

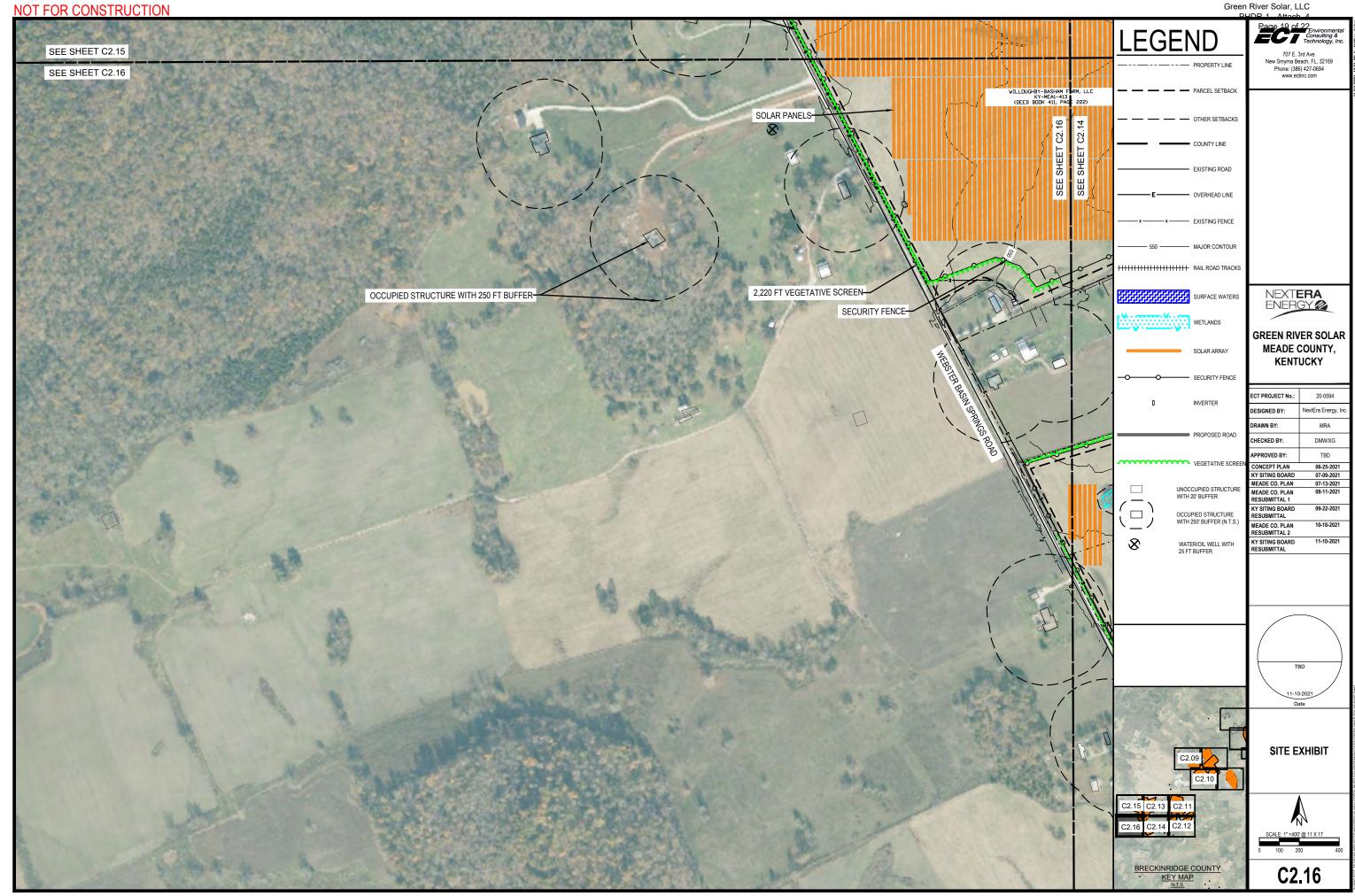




Case No. 2020-00387 Green River Solar, LLC NOT FOR CONSTRUCTION **LEGEND** 707 E. 3rd Ave. New Smyrna Beach, FL, 32169 Phone: (386) 427-0694 www.ectinc.com PARCEL SETBACK RAWLAND E. EVANS SR. & MARY K. WILHAM (DEED BOOK 428, PAGE 080) 50 FT PARCEL SETBACK -590 FT VEGETATIVE SCREEN NEXT**ERA** ENERGY 🐼 SURFACE WATERS ALLEN HICKS (DEED BOOK 677, PAGE 43) WETLANDS **GREEN RIVER SOLAR MEADE COUNTY,** SOLAR ARRAY **KENTUCKY** SECURITY FENCE OVERHEAD TRANSMISSION LINE WIRTH 50 FT EASEMENT CT PROJECT No.: 20-0594 INVERTER -10' WIDE ACCESS ROAD NextEra Energy, Ir SIGNED BY: MRA AWN BY: PROPOSED ROAD HECKED BY: TBD PROVED BY: VEGETATIVE SCRE ONCEPT PLAN 06-25-2021 Y SITING BOARD 07-09-2021 MEADE CO. PLAN 07-13-2021 UNOCCUPIED STRUCTURE WITH 20' BUFFER MEADE CO. PLAN RESUBMITTAL 1 09-22-2021 Y SITING BOARD OCCUPIED STRUCTURE WITH 250' BUFFER (N.T.S.) 10-18-2021 MEADE CO. PLAN 8 KY SITING BOARD RESUBMITTAL 11-10-2021 WATER/OIL WELL WITH 25 FT BUFFER -SOLAR PANELS -WETLANDS WITH 25 FT BUFFER TBD BRIAN HAAG & JONATHON W. THOMAS (DEED BOOK 616, PAGE 025) -INVERTER MARINO PROPERTY, LLC (DEED BOOK 345, PAGE 540) (PLAT CABINET A, SLIDE 321) LOT 24 740 FT VEGETATIVE SCREEN SITE EXHIBIT –1,950 FT VEGETATIVE SCREEN 🔀 C2.05 MARINO PROPERTY, LLC (DEED BOOK 345, PAGE 540) (PLAT CABINET A, SLIDE 321) LOT 25 C2.06 MARINO PROPERTY, LLC (DEED BOOK 345, PAGE 540) (PLAT CABINET A, SLIDE 321) LOT 26 ►530 FT VEGETATIVE SCREEN SEE SHEET C2.08 SEE SHEET C2.08 SEE SHEET C2.10 PAGE 540)
SLIDE 321) SEE SHEET C2.07 C2.08 MEADE COUNTY KEY MAP 1,950 FT VEGETATIVE SCREEN





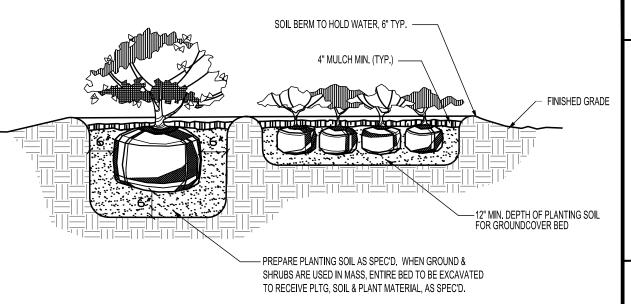


Case No. 2020-00387

NOT FOR CONSTRUCTION

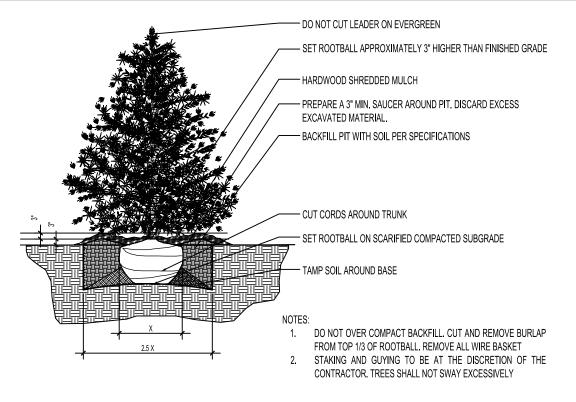
PHDR-1 - Attach 4





NOTE: CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING PITS / BEDS PRIOR TO INSTALLATION

## SHRUB AND GROUNDCOVER DETAIL



**EVERGREEN PLANTING DETAIL** 

## Table 1. Potential Evergreen and Deciduous Species Utilized by the Proposed Project

Туре	Species	Scientific Name
Coniferous Trees and Shrubs	White Pine	Pinus strobus
	Virginia Pine	Pinus virginiana
	Red Cedar	Juniperus virginiana
	Common Juniper*	Juniperus communis
	Eastern Hemlock	Tsunga canadensis
Broadleaf Small Trees and Shrubs	Serviceberry	Amelanchier spp.
	Dogwood	Cornus spp.
	Winterberry	llex spp.
	Chokecherry	Prunus virginiana
	Ninebark	Physocarpus opulifolius
	Sumac	Rhus spp.
	Viburnum	Viburnum spp.
	Redbud	Cercis canadensis

<sup>\*</sup> an upright growing habitat cultivar

Consulting & Technology, Inc.

707 E. 3rd Ave.

New Smyrma Beach, FL, 32169

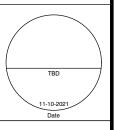
Phone: (386) 427-0694

www.ectinc.com

NEXT**ERA** ENERGY

#### GREEN RIVER SOLAR MEADE COUNTY, KENTUCKY

DESIGNED BY:	NextEra Energy, Inc.
DRAWN BY:	MRA
CHECKED BY:	DMW/XG
APPROVED BY:	TBD
CONCEPT PLAN	06-25-2021
KY SITING BOARD	07-09-2021
MEADE CO. PLAN	07-13-2021
MEADE CO. PLAN RESUBMITTAL 1	08-11-2021
KY SITING BOARD RESUBMITTAL	09-22-2021
MEADE CO. PLAN RESUBMITTAL 2	10-18-2021
KY SITING BOARD RESUBMITTAL	11-10-2021



LANDSCAPE ILLUSTRATION

C3.02

#### CASE NO. 2020-00387

## RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

**POST-HEARING REQUEST** 

**RESPONSIBLE PARTY:** Lina Jensen

Provide any written responses received from Green River Solar's Request 5.

engineering, procurement, and construction contractors concerning noise suppression methods and

the inability to provide reliable cost estimates for the implementation of such methods.

Response 5.

Green River Solar reached out to several EPCs that have built projects in NextEra Energy

Resource's portfolio. None of the EPCs had experience with noise suppression methods during

pile driving. Several EPCs felt that there could be safety concerns utilizing a semi-truck with a

noise wall driving throughout the site. Feedback from the EPCs included a more common method

of working with local residents and establishing a timeline when there will be nuisance noise from

pile driving activities, for example avoiding early morning or evening pile driving, or pile driving

that would interfere with nearby community activities.

These discussions were held verbally, and no written responses were received.

#### CASE NO. 2020-00387

## RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

**POST-HEARING REQUEST** 

**RESPONSIBLE PARTY: Lina Jensen** 

Provide a copy of the conditional use permit obtained from the Meade Request 6.

County Planning Commission.

Response 6.

The Conditional Use Permits from the Meade County Planning Commission have not yet been

issued. Green River Solar has been advised that the Conditional Use Permits should be received

no later than Friday, November 19th. Green River Solar will supplement this response once the

Conditional Use Permits are received.

#### CASE NO. 2020-00387

## RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

**POST-HEARING REQUEST** 

**RESPONSIBLE PARTY: Lina Jensen** 

Request 7. Confirm the leases for the land underlying the Project are with Merino Solar, LLC (Merino Solar) and not with Green River Solar.

#### Response 7.

The Project confirms that the leases for the land underlying the Project are currently with Merino Solar, LLC.

Green River Solar, LLC will cause Merino Solar LLC, its wholly-owned subsidiary, to merge into it, with Green River Solar, LLC the survivor. Under Delaware law, the rights and obligations of Merino Solar LLC will become the rights and obligations of Green River Solar, LLC.

#### CASE NO. 2020-00387

#### RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

POST-HEARING REQUEST

**RESPONSIBLE PARTY: Lina Jensen** 

**Request 8.** Confirm whether Merino Solar will be assigning the landowner agreements for the Project to Green River Solar.

#### Response 8.

Merino Solar, LLC will not be assigning the leases to Green River Solar, LLC.

Green River Solar, LLC will cause Merino Solar LLC, its wholly-owned subsidiary, to merge into it, with Green River Solar, LLC the survivor. Under Delaware law, the rights and obligations of Merino Solar LLC will become the rights and obligations of Green River Solar, LLC.

#### CASE NO. 2020-00387

## RESPONSE TO POST-HEARING INFORMATION REQUEST

SITING BOARD STAFF'S POST-HEARING REQUEST FOR INFORMATION DATED

11/3/2021

**POST-HEARING REQUEST** 

**RESPONSIBLE PARTY:** Lina Jensen

Provide a copy of the decommissioning plan for Meade County and Request 9.

Breckenridge County. Confirm whether Merino Solar or Green River Solar is currently the obligor

pursuant to the decommissioning plan. Confirm whether Green River Solar is financially

committed to fulfilling the decommissioning and bonding obligations set forth in the landowner

agreements and decommissioning plan for the Project. Explain any steps that will be taken to

ensure Green River Solar, as the proposed recipient of the construction certificate, is the entity

responsible for the decommissioning and bonding obligations.

Response 9.

Please see Attachment 9 for a copy of the decommissioning plan for Meade County.

Green River Solar confirms it is the obligor pursuant to the decommissioning plan and is

financially committed to fulfilling the decommissioning and bonding obligations as required by

the Meade County Solar Energy Systems Ordinance.

The decommissioning obligations for the Breckinridge County project area will be undertaken pursuant to the individual land leases.

The Project confirms that the leases for the land underlying the Project are currently with Merino Solar, LLC. However, Green River Solar, LLC will cause Merino Solar LLC, its wholly-owned subsidiary, to merge into it, with Green River Solar, LLC the survivor. Under Delaware law, the rights and obligations of Merino Solar LLC will become the rights and obligations of Green River Solar, LLC.

## DECOMMISSIONING PLAN Green River Solar Project

## **Prepared for:**

## Green River Solar, LLC 700 Universe Boulevard Juno Beach, FL

## **Prepared by:**



3720 Wilder Road, Unit B Bay City, MI 48706

**July 2021** 

## **TABLE OF CONTENTS**

<u>Section</u>		<u>Page</u>
1.0	INTRODUCTION	1
2.0	SOLAR FACILITY COMPONENTS	2
3.0	DECOMMISSIONING TASKS AND SEQUENCE	4
4.0	DECOMMISSIONING COST ESTIMATE SUMMARY	5
5.0	RESTORATION PLAN	6
6.0	TIMELINE AND PARTIES RESPONSIBLE TO COMPLETE DECOMMISSIONING	6
7.0	DECOMMISSIONING PLAN UPDATES	7
8.0	DECOMMISSIONING SECURITY	7
<u>List of T</u>	<u>ables</u>	
Table 1.	Estimated Decommissioning Costs and Salvage Values	



#### 1.0 INTRODUCTION

Green River Solar, LLC (Green River) contracted Environmental Consulting & Technology, Inc. ("ECT") to prepare a Decommissioning Plan ("Plan") for the Green River Solar Project ("Project") in Meade County, Kentucky. This Plan was prepared to document Green River's intent to decommission the Project and to meet the requirements of subsection 4.3.7.3(i) of the Meade County Zoning Ordinance. The Meade County Zoning Ordinance requires that a decommissioning plan be submitted that includes: (a) the defined conditions for when the decommissioning be initiated; (b) removal of all non-utility-owned equipment, conduit structures, fencing, roads, and foundations to a depth of three (3) feet; (c) restoration of the property to substantially similar physical condition that existed immediately prior to construction; (d) the timeframe for completing decommissioning; (e) the party currently responsible for decommissioning, and (f) the plans for updating the decommissioning plan.

Within Meade County, the Project is a proposed 70 megawatt (MW) photovoltaic energy generating facility. The Project is proposed to be located on 574 acres of undeveloped agricultural land that is generally located 4 miles southwest of Brandenburg, 15 miles west of Fort Knox, immediately north of Irvington, and east of Guston and Ekron. The Solar energy system ("SES") would connect to the existing 161 kilovolt (kV) transmission system at the point of interconnection ("POI") substation located at the intersection of Highway 79 and Guston Road.

The Project components consist of photovoltaic ("PV") modules, a fixed-tilt racking system, central electric inverters and transformers, underground electrical collection systems, electrical collector substation, point of interconnection, switchyard, interconnection facilities, a solar meteorological station, supervisory control and data acquisition (SCADA) hardware, control house and associated facilities, private gravel access roads with gated ingress/egress points, and security fencing.

The site restoration will remove all above ground equipment associated with the project, including the electrical substation. All below grade items will be removed to a depth of three (3) feet below grade and solar module support posts will be completely removed. Any electrical casing or conduit below the three-foot depth will remain in place in order to minimize disruption to the land. Gravel access roads will be removed unless the landowner requests that they remain in place. Temporary facilities associated with construction will include a laydown yard that will serve as facilities for construction office trailers and delivery



Case No. 2020-00387 Green River Solar, LLC PHDR-1 - Attach. 9 Page 4 of 9

points for major equipment. Collectively, the facilities listed in this section comprise the "Project Facilities" (See **Figure 1 – Project Map**).

As previously stated, the purpose of this Plan is to outline the procedures to decommission the facility and to restore the properties to be substantially similar to its pre-construction state to the extent practicable upon expiration of the operational life of the Project.

Estimated costs are provided based on the array design and associated facilities proposed to be installed for the Project in Meade County. The Project will post a Surety Bond or other form of Security acceptable to the County for the abandonment of the site and in the event the Commission must remove the facility. The surety bond or other form or security shall be equal to the estimate submitted for the decommissioning of the project. The cost of decommissioning will include a reasonable reduction for the scrap value of the components left on the property. Green River plans to reevaluate these decommissioning costs every 5 years throughout the life of the Project and will adjust the financial security accordingly, consistent with the Section 4.3.7.3.1 (1).

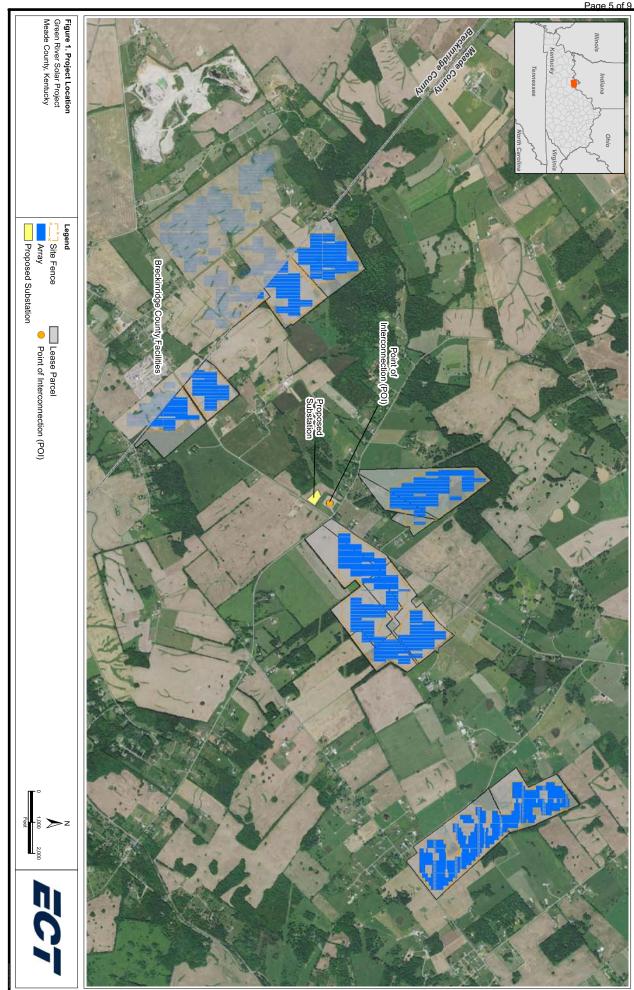
### 2.0 SOLAR FACILITY COMPONENTS

The primary components of the Project include the following solar components and associated infrastructure:

- Monocrystalline photovoltaic modules: 320,000
- Collector substation and associated equipment: 1 transformer, 1 control house with associated data monitoring equipment, SCADA, telecommunications equipment, electrical breakers, miscellaneous steel structures
- Central inverters: 36
- Underground collection system: 109,215feet of AC cable
- Meteorological station: 2
- Private gravel access roads: 45,000 feet
- Security fencing: 76,000 feet

Green River, or its successors and assigns, will be responsible for the decommissioning of the Project. Utility-scale solar facilities have a mechanical life expectancy of thirty (30) years.





## 3.0 DECOMMISSIONING TASKS AND SEQUENCE

Green River acknowledges that all solar components including Project Facilities constructed above ground and any structures below-grade will be removed offsite for disposal except for: (i) access roads or driveways on private property if the property owner requests in writing to Green River for such to remain, (ii) any infrastructure the subsequent landowner at the time of decommissioning may wish to retain as it may be beneficial to post-solar agricultural land use; infrastructure such as, but not limited to, fencing and stormwater basins (iii) switchyard, interconnection facilities and other similar utility facilities not owned by Green River, and (iv) non-recoverable underground cables below a depth of 3 ft.

Green River anticipates decommissioning will occur over a period of 250 days, unless, external circumstances prohibit site work, such as weather delays. All applicable local and state approvals and permits for the removal of the Project facilities will be obtained prior to the start of decommissioning.

The anticipated sequence of decommissioning and removal are described below; however, an overlap of activities is expected.

- 1. De-energize solar arrays and other facilities, if not already de-energized.
- 2. Dismantle panels, racking and frames.
- 3. Remove inverters, transformers and electrical cables and conduits (as recoverable).
- 4. Remove fencing and miscellaneous equipment.
- 5. Remove structural foundations.
- 6. Remove access and internal roads, if not retained by the property owner.
- 7. De-compact soils (if needed), and restore disturbed land to pre-construction conditions to the extent practicable.
- 8. Revegetate any exposed soil that was disturbed during decommissioning.

The restoration efforts will return the land to substantially its original condition to the extent practicable, leaving any desirable infrastructure as requested by the subsequent landowner. A significant amount of earthwork is not likely to be required due to the limited disturbance associated with construction and operations of the Project. Nonetheless, restoration activities may include regrading to restore land contours to the extent practicable, seeding to revegetate disturbed areas, de-compacting of soils determined to be compacted and back-filling with native subsoil or topsoil as needed.



#### 4.0 DECOMMISSIONING COST ESTIMATE SUMMARY

Decommissioning costs detailed in Table 1 include labor and material expenses for removal of solar modules, tracking system, steel posts, transformers and inverters, access roads, perimeter fencing, cabling below-grade and other Project Facilities. The estimates provided in **Table 1** combine both the cost of decommissioning and removal, including site restoration, as well as the salvage value from the recovered materials. Solar components anticipated to have a resale or salvage value that can offset the cost of decommissioning include solar modules, racking systems, steel piles, inverters, and transformers. The materials recovered include the insulated copper wire, bare copper, aluminum and steel that constitute raw materials making up the Project facilities. Reselling these valuable materials is a common practice in demolition and decommissioning of facilities because of the high value of these components.

Materials that have no value at the time of decommissioning will be recycled when possible or hauled offsite to a licensed solid waste disposal facility. As the great majority of the facility will consist of reusable and recyclable items, only a small percentage of the project components and materials will be disposed of in landfills. Materials that cannot be recycled or reused would be disposed of at an appropriate public licensed landfill. Any items or materials that are landfilled will be nontoxic. The costs of removal, transportation and disposal are included in these estimates.

Furthermore, with the growth and development of solar technologies, there are secondary market opportunities to reuse and/or repurpose solar modules. These opportunities are not accounted for in the current estimates.



Table 1. Estimated Decommissioning Costs and Salvage Values

Decommissioning Task Description	Cost/Value
De-energize the facility	\$32,400.00
Dismantle panels and PV frames	\$3,585,745.00
Remove inverters, electrical cables and conduits down to three ft (as recoverable)	\$85,970.00
Remove fencing and miscellaneous equipment / Grading	\$172,500.00
Remove structural foundations and access roads (if not retained by owner)	\$282,250.00
Earthwork and stabilization (decompact, restore, revegetate as needed)	\$274,727.88
Total Decommissioning Cost	\$4,433,592.88
Total Estimated Material Recovery (Salvage) Value	\$1,783,390.00
Total Estimated Decommissioning Costs	\$2,650,202.88

#### 5.0 RESTORATION PLAN

In accordance with Section 4.3.7.3.i(2)(c), as a part of decommissioning, the Restoration Plan would attempt to return the property to its condition prior to the installation of the Level 3 SES to the extent practicable. A more detailed restoration plan will be prepared prior to decommissioning and per existing site conditions at the time.

It is unlikely that a significant amount of earthwork would be required as the construction, operations, and maintenance of the Project calls for limited disturbance. Nevertheless, if necessary, Green River or the assigned responsible party would regrade and contour the area to establish proper stormwater and sediment controls until the area is established.

# 6.0 TIMELINE AND PARTIES RESPONSIBLE TO COMPLETE DECOMMISSIONING

In accordance with Section 4.3.7.3.i(2)(d), decommissioning would begin no later than 12 months (365 days) after the Level 3 SES has ceased to generate electricity. Decommissioning would be completed no later than 12 months (365 days) after commencement of decommissioning, with plans to take approximately 250 days to complete. In accordance with Section 4.3.7.3.i(2)(e), Green River or a designated party as approved by the Meade



County Board of Commissioners will assume responsibility to conduct decommissioning activities within the posted timeframe.

#### 7.0 DECOMMISSIONING PLAN UPDATES

In accordance with Section 4.3.7.3.i(2)(f), Green River will prepare a final Decommissioning Plan once the Project design is finalized. This final Decommissioning Plan will be provided to Meade County at least four (4) weeks prior to the commencement of construction. Green River agrees to update this Decommissioning Plan every five years during the life of the Project.

#### 8.0 DECOMMISSIONING SECURITY

In accordance with Section 4.3.7.3.1 of the Meade County Zoning Ordinance, the Project plans to post a Surety Bond or other form of Security acceptable to the County, for the abandonment of the site and in the event the Commission must remove the facility. The surety bond or other form or security will be equal to the decommissioning estimate submitted with the final decommissioning plan. The cost of decommissioning will include a reasonable reduction for the scrap value of the components left on the property, as shown in the previous section. Green River plans to reevaluate these decommissioning costs every 5 years throughout the life of the Project and will adjust the financial security accordingly, consistently with the Section 4.3.7.3.1 (1).

