

# SITE PLAN REVIEW APPLICATION

## ROCKY MAPLE SOLAR

**Off North Carver Road  
Wareham and Carver, Massachusetts**

*Prepared for:*  
**BE RE, LLC  
PO Box 974  
Edwards, Colorado, 81632**

*Prepared by:*  
 **BEALS + THOMAS**  
BEALS AND THOMAS, INC.  
32 Court Street  
Plymouth, Massachusetts  
02360-3866

*Submitted in Compliance with the Wareham  
Zoning By-laws*

**December 16, 2020**



December 16, 2020

Mr. George Barrett, Chair  
c/o Ken Buckland and Sonia Raposo  
Wareham Planning Board  
54 Marion Road  
Wareham, Massachusetts 02571

Via: FedEx and Email to [sraposo@wareham.ma.us](mailto:sraposo@wareham.ma.us)

Reference: Site Plan Review Application  
Rocky Maple Solar  
Off North Carver Road  
Wareham & Carver, Massachusetts  
B+T Project No. 3203.00

Dear Chairperson Barrett and Members of the Commission:

On behalf of the Applicant, BE RE, LLC, Beals and Thomas, Inc. (B+T) respectfully submits this Site Plan Review Application for the installation of a dual use, large-scale, ground-mounted solar energy facility on the existing agricultural land located off North Carver Road in Wareham and Carver, Massachusetts (the Project). This project has been designed in compliance with the *Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units (ASTGU)* requirements within the Solar Massachusetts Renewable Target (SMART) program regulations (225 CMR 20.00), which allows for and encourages the dual use of agricultural land, (i.e. maintaining the existing operations while also utilizing the land for solar energy generation). **The proposed work lies within actively farmed land, and other existing disturbed areas, such as the associated agricultural access roads.**

The Property is located within the Residential (R-60) District and is allowable with the issuance of a Site Plan Approval by the Wareham Planning Board in accordance with the Table of Principal Use Regulations in Article 3 of the Wareham Zoning By-Laws (the By-Law). The Project is sited appropriately within active agricultural land, complies with applicable zoning criteria, and meets the requirements set forth by the By-Law.

The cranberry industry in Massachusetts is facing a downturn due largely to a significant over supply of farms and fruit. Many farm owners are struggling to survive in the current economy and are realistically facing difficult choices in what the future holds for their land. This issue is so prominent that the 2016 Massachusetts Cranberry Revitalization Task Force was formed to make numerous recommendations about how cranberry farms could potentially be diversified or, in some cases, retired. The SMART program has taken the Task Force's recommendations for adding renewable energy components to farms and developed the dual use program.

---

144 Turnpike Road  
Southborough, MA 01772

Regional Office: Plymouth, MA

T 508.366.0560 | [www.bealsandthomas.com](http://www.bealsandthomas.com) | F 508.366.4391

The intent of this program, developed by the Massachusetts Department of Energy Resources (DOER), Massachusetts Department of Agricultural Resources (MDAR) and Massachusetts Department of Environmental Protection (MassDEP), is to offer an option that maintains the Commonwealth's farms by adding a diversified income stream. As a requirement to qualify for the SMART program, the continued cultivation, harvest, and delivery of cranberry crops is essential. Ongoing agricultural activity requires a dual use solar array that features increased panel height and row spacing to allow for continued mechanical cultivation and irrigation practices. The increased spacing, which requires more acreage for a permissible project, also allows for reduced shading on the crop from the panels above. Dimensional requirements are discussed in detail herein.

Enclosed are three hard copies of the Site Plan Review application package, plus a complete electronic copy on a USB drive. We understand that the Planning Office will coordinate with the Town Clerk to confirm receipt of these materials pursuant to Section 17(b)(i) of Chapter 53 of the Acts of 2020, and will forward one of the hard copies to the Town Engineer.

Enclosed is a check payable to the Town of Wareham in the amount of \$750.00 for the appropriate filing fee as required by the Zoning By-laws. An additional check in the amount of \$99.90 to cover abutter notification expenses has been forwarded to the Town under separate cover. We understand that the Planning Board will be responsible for notification to abutters via Certified Mail. We further understand that the Planning Board will be responsible for publishing the notice of public hearing in the Wareham Week, for which an additional \$80.00 check is included. Lastly, a check in the amount of \$200.00 payable to the Wareham Fire Department is enclosed to facilitate its review.

The following information is included for your review:

- Section 1.0: Site Plan Review Forms
- Section 2.0: Project Narrative
- Section 3.0: Abutter Information
- Section 4.0: Stormwater Management Information
- Section 5.0: Site Photographs
- Section 6.0: Solar Documentation
- Section 7.0: Plans

**Waiver(s) Requested:**

The Applicant respectfully requests the following waivers, if necessary and required:

**Subsection 1532:** "Existing Features" that requires that plans be at a scale of 1" = 20', 40', or 100' where practical and appropriate. Since the site is located on a large property, in order to accurately and legibly depict certain aspects of the project, plans have been submitted at various scales.

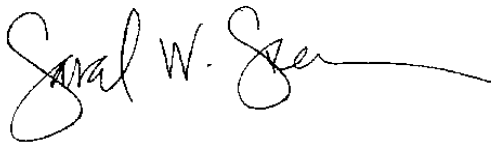
**Section 1532.1** “Plans are to include but not limited to the following...Existing Natural Features”  
2. “Individual trees 18” dbh or over.” Though tree clearing is limited, due to the size of the property and the character of the project, it is infeasible to locate all trees greater than 18 inches.

**Section 591.6** “All large ground-mounted solar energy facilities shall be fenced for security...”. Though the Applicant proposes to fence and gate electrical equipment pads with a 7-foot high security fence, due to the dual use classification of the project including increased height of the arrays and the location of the project on the less accessible active cranberry bogs, we respectfully request a waiver from the typical fencing requirement. Further, fencing the array would create additional constraints to the required agricultural operation onsite.

Should you have any questions regarding this matter or require additional information, please contact us at (508) 366-0560. We thank you for your consideration of this Site Plan Review Application and look forward to meeting with the Planning Board at the hearing on January 11, 2021.

Very truly yours,

BEALS AND THOMAS, INC.



Sarah W. Stearns, PWS  
Associate

Enclosures

cc: BE RE, LLC, Adam Shumaker and Kirsten Eliassen (via Email)  
New England Consulting, Iain Ward (via Email)

CEB/sws/aak/320300PT001

**TABLE OF CONTENTS**

**1.0 SITE PLAN REVIEW APPLICATION FORMS ..... 1-1**

**2.0 PROJECT NARRATIVE ..... 2-1**

2.1 INTRODUCTION ..... 2-1

2.2 EXISTING CONDITIONS ..... 2-2

2.3 PROPOSED CONDITIONS ..... 2-2

    2.3.1 *Description of Work*..... 2-3

2.4 COMPLIANCE WITH LOCAL REQUIREMENTS..... 2-5

    2.4.1 *Section 420: Flood Plain District* ..... 2-5

    2.4.2 *Section 590: Solar Energy Generation Facilities* ..... 2-7

    2.4.3 *Article 15: Site Plan Review* ..... 2-9

2.5 WAIVER REQUEST..... 2-13

**3.0 PARTIES IN INTEREST ..... 3-1**

**4.0 STORMWATER MANAGEMENT INFORMATION ..... 4-1**

**5.0 SITE PHOTOGRAPHS..... 5-1**

**6.0 SOLAR DOCUMENTATION ..... 6-1**

**7.0 PLANS ..... 7-1**

## **Section 1.0**

### **Site Plan Review Application Forms**

---

Application for Site Plan Review

Site Plan Review Checklist

Site Plan Review Application Checklist

Town of Wareham Site Plan Review Form

Planning Board Tax Verification Form

Record of Planning Board Proceedings and Decisions

## APPLICATION FOR SITE PLAN REVIEW

Page 1 Applicant: Name: BE RE, LLC. c/o Adam Schumaker

Mailing address: PO Box 974 Edwards, Colorado 81632

Telephone: 385-315-0024

Project: Street & Number: 0 North Carver Road

Assessor's Map: 104 Lot(s) 1049-A, 1049-B, 1049-D, 1050

Dwelling Units # 0

Parking Spaces # 0

Acres: 110 acres Square Feet Commercial Space: \_\_\_\_\_

Briefly describe project: The Project includes the construction and installation of a dual use, agricultural and ground mounted solar energy system on actively farmed cranberry bogs and blueberry patches.

Date: 8/23/20

Signature of Applicant: 

## SITE PLAN REVIEW CHECKLIST

Plans shall be prepared by a registered architect, landscape architect, or Professional Engineer. 14 complete sets are required with the following information included:

### 1. GENERAL INFORMATION

- \_\_\_\_\_ Developer name, address, telephone number
- \_\_\_\_\_ Property owner name, address, telephone number, legal relationship between developer and property owner
- \_\_\_\_\_ Date of application
- \_\_\_\_\_ Statement briefly describing project (**Refer to the Project Narrative**)
- \_\_\_\_\_ Locus map (1" = 2,000') (**Refer to the Locus Map in the Project Narrative**)
- \_\_\_\_\_ Location of property to surrounding area (this plan shall show at a scale of not less than 1" = 100' the general characteristics of all lands within 200' of the proposed site and shall include structures, parking areas, driveways, pedestrian ways and natural characteristics)
- \_\_\_\_\_ Zoning district (square feet within each district if more than one district)
- \_\_\_\_\_ Total area of project in square feet to include wetland and 100 year flood plain (both in square feet)
- \_\_\_\_\_ All contiguous land owned by the applicant or by the owner of the property. At the discretion of the Planning Board photographs of the site at size 8" x 10"

### 2. EXISTING FEATURES

Plans shall be accurately drawn to a scale of 1" = 20', 1" = 40', or 1" = 100' where practical and appropriate to the size of the proposal and shall show all existing natural, manmade, and legal features of the site. Such plans are to include but not be limited to the following:

- \_\_\_\_\_ Tree line of wooded area
- \_\_\_\_\_ Individual trees 18" dbh or over (**Refer to the Waiver Request in the Project Narrative**)
- \_\_\_\_\_ Bogs or agricultural areas



- \_\_\_\_\_ All wetlands protected under CMR 10.02 (1) (a-d)
- \_\_\_\_\_ Flood plain (100 years) with base flood elevation data
- \_\_\_\_\_ Contour lines (2' intervals)
- \_\_\_\_\_ General soil types

## 2b. EXISTING MANMADE FEATURES

- \_\_\_\_\_ Vehicle accommodation areas
- \_\_\_\_\_ Street, roads, private ways, walkways
- \_\_\_\_\_ Curbs, gutters, curb cuts, drainage grates
- \_\_\_\_\_ Storm drainage facilities, including manholes
- \_\_\_\_\_ Utility lines, including water, sewer, electric, telephone, gas, cable TV
- \_\_\_\_\_ Fire hydrants and location of dumpsters
- \_\_\_\_\_ Building, structures, and signs (free standing), including dimensions of each
- \_\_\_\_\_ Existing light fixtures

## 2C. EXISTING LEGAL FEATURES

- \_\_\_\_\_ Zoning of property (district lines)
- \_\_\_\_\_ Property lines (with dimensions identified)
- \_\_\_\_\_ Street right of way lines
- \_\_\_\_\_ Utility or other easement lines
- \_\_\_\_\_ Monuments

## 3. THE DEVELOPMENT PLAN

The development plan shall show proposed changes in the (a) existing natural features; (b) existing man made features and (c) existing legal features.

The Development Plan shall include:

- \_\_\_\_\_ Square feet in every new lot
- \_\_\_\_\_ Lot dimensions
- \_\_\_\_\_ Location and dimensions of all buildings and free standing signs as well as the distances from all buildings to lot lines, streets, or street right of way
- \_\_\_\_\_ Building elevations (side, front, and back for a typical unit) showing building height and any proposed wall signs
- \_\_\_\_\_ Location, dimensions, and designated use for all recreation areas
- \_\_\_\_\_ Location and dimension of all open space; indicate whether open space is to be dedicated to public use or to remain private
- \_\_\_\_\_ Streets (including street names) which conform to the design standards of the Planning Board's Rules and Regulations Governing the Subdivision of Land
- \_\_\_\_\_ Curbs and gutters, curb cuts, drainage grates
- \_\_\_\_\_ Drainage facilities including manholes, pipes, drainage ditches, and retention ponds
- \_\_\_\_\_ Sidewalks and walkways showing widths and materials
- \_\_\_\_\_ Outdoor illumination with lighting fixture size and type identified
- \_\_\_\_\_ Utilities; water, sewer, electric, telephone, gas, cable TV
- \_\_\_\_\_ Fire hydrant location
- \_\_\_\_\_ Dumpster (trash collection facilities)
- \_\_\_\_\_ New contour lines resulting from earth movement (at 2' intervals) and indications of types of ground cover and other precautions to stabilize slopes
- \_\_\_\_\_ Vehicle parking, loading, and circulation areas showing dimensions
- \_\_\_\_\_ Proposed new plantings by size and location or construction of other devices to comply with screening and shading requirements

#### 4. IMPACT STATEMENT (Refer to the Project Narrative)

In order to evaluate the impact of the proposed development to Town services and the welfare of the community, there shall be submitted an impact statement in two parts.

\_\_\_\_\_ All applicable Town services including but not limited to schools, sewer services, water systems, parks, fire, and police.

\_\_\_\_\_ The roads in the immediate vicinity of the proposed development (including an estimate of both peak and average daily counts)

\_\_\_\_\_ The ecology of the area within the site and any significant off-site impacts

Part Two shall describe what actions have been taken to mitigate the impacts described in Part One

This application constitutes the applicant's willingness to work under the Town of Wareham's Zoning Bylaws. Any errors or omissions from this checklist or the Zoning Bylaw may result in the application not being placed on a Planning Board Agenda or denial of the Site Plan.

## Site Plan Review Application Checklist

**Note to Applicant(s):** The following checklist serves as an instrument to help ensure that all necessary information and materials are submitted with the application for Site Plan Review. Please verify that all related items listed below have been accounted for in your submission. (Refer to Article 15 of the Zoning By-Law of the Town of Wareham, Massachusetts, adopted October 2004).

Name of site: Rocky Maple Solar Date: December 16, 2020

Owner(s): Brett Meredith

Address: PO Box 389 Carver, Massachusetts 02330

Telephone Number: 508-726-4923 Cell Phone: \_\_\_\_\_

Developer(s): BE RE, LLC. c/o Adam Schumaker

Address: PO Box 974 Edwards, Colorado 81632

Telephone Number: 385-315-0024 Cell Phone: \_\_\_\_\_

**Relationship between Developer & Property Owner:** \_\_\_\_\_

Surveyor: Beals and Thomas, Inc.

Engineer: Beals and Thomas, Inc.

Architect: N/A

Landscape Architect: Beals and Thomas, Inc.

ITEM	Complete
Application for Site Plan Review – Special Permit filed with Planning Board (14 copies of application and supplementary materials)	X
Application for Special Permit – Residential Cluster Development filed with Planning Board (11copies of application and supplementary materials)	N/A
Copies filed with Town Clerk	X
Filing Fees	X
GENERAL INFORMATION	
Developer Name, address, telephone number	X
Property Owner Name, address, telephone number	X
Date of Application	X
Statement briefly describing project	X
Locus Map (1" = 2,000')	X
Location of property to surrounding area (scale should be no less than 1" = 100') and general characteristics of all lands within 200' of the proposed site including structures, parking areas, driveways, pedestrian ways, and natural characteristics	X

Zoning district (sq. feet within each district if more than one)	X
Total area of project to include wetland and 100 year floodplain (both in sq. feet)	X
All contiguous land owned by the applicant or by owner of property	X
Photographs of site (8" by 10") – at discretion of Permitting Authority	X
List of abutters, certified by Board of Assessors	X
Number of dwellings which could be constructed by means of a conventional development plan, considering the whole tract, exclusive of water bodies and land prohibited from development by legally enforceable restrictions, easements, or covenants. This includes: <ul style="list-style-type: none"> <li>Any bank, freshwater wetland, coastal wetland, beach, dune, flat, marsh, or swamp bordering the ocean, any estuary, creek, river, stream, pond, or lake</li> <li>Lake under any of the water bodies listed above;</li> <li>Land subject to tidal action</li> <li>Land subject to coastal storm flowage or slopes in excess of fifteen (15) percent are not to be counted in figuring the number of permissible units of conventional development.</li> </ul>	N/A
<b>EXISTING FEATURES</b>	
(Scale 1" = 20', 1" = 40', or 1" = 100' where practical and appropriate to the size of the proposal) Must include a minimum of the following:	
<b>1. Existing Natural Features</b> <ol style="list-style-type: none"> <li>Tree line of natural area;</li> <li>Individual trees 18" dbh or over;</li> <li>Bogs or agricultural areas;</li> <li>All wetlands protected under 310 CMR 10.01 (1) (a-d); floodplain (100 year) with base flood elevation data;</li> <li>Contour lines (2' intervals);</li> <li>General soil types.</li> </ol>	X
<b>2. Existing Man-Made Features</b> <ol style="list-style-type: none"> <li>Vehicle accommodation areas; streets, roads, private ways, walkways;</li> <li>Curbs, gutters, curb cuts, drainage grates;</li> <li>Storm drainage facilities including manholes;</li> <li>Utility lines including water, sewer, electric, telephone, gas, cable TV;</li> <li>Fire hydrants and location of dumpsters;</li> <li>Buildings, structures, and signs (free standing) including dimensions of each;</li> <li>Exterior lighting features.</li> </ol>	X
<b>3. Existing Legal Features</b> <ol style="list-style-type: none"> <li>Zoning of property (district lines);</li> <li>Property lines (with dimensions identified);</li> <li>Street right-of-way lines;</li> <li>Utility or other easement lines;</li> <li>Monuments.</li> </ol>	X

<b>DEVELOPMENT PLAN</b>	
Proposed changes to existing natural features, existing man-made features, and existing legal features including the following;	
• Area of each new lot in square feet;	N/A
• Lot dimensions;	X
• Location and dimensions of all buildings and freestanding signs as well as the distances from all buildings to lot lines, streets, or street;	N/A
• Location, dimension, and designated use for all recreation areas;	N/A
• Location and dimension of all open space (indicate whether such open space is to be dedicated to public use or remain private);	N/A
• Streets (including street names) which conform to the design standards of the Planning Board's Rules and Regulations Governing the Subdivision of Land;	N/A
• Curbs and gutters, curb cuts, drainage grates;	N/A
• Drainage facilities including manholes, pipes, drainage ditches, and retention ponds;	N/A
• Sidewalks and walkways showing widths and materials;	N/A
• Outdoor illumination with lighting fixture size and type identified;	X
• Utilities – Water, sewer, electric, telephone, gas, cable TV;	X
• Fire hydrant locations;	N/A
• Dumpster (trash collection facilities);	N/A
• New contour lines resulting from earth movement (2' intervals) and indications of types of ground cover and other precautions to stabilize slopes;	N/A
• Vehicle parking, loading, and circulation areas showing dimensions and layout of parking spaces, travel lanes, aisles, and driveways;	N/A
• Proposed new plantings by size and location or construction of other devices to comply with screening and shading requirements.	N/A
<b>IMPACT STATEMENT</b>	
<b>Part One:</b> Description of neighborhood and impact of proposed development on all applicable town services including but not limited to schools, sewer service, water system, parks, fire, and police protection;	X
Traffic report of existing and future traffic within and adjacent to proposed development. (Include estimate of both peak and average daily traffic count);	X
Analysis of site in regards to wetlands, coastal wetlands, slopes, soil conditions, 100 year flood plain, and other natural features as Planning Board may request;	X
Environmental Impact Assessment Report relating to proposed plan and copy of environmental impact report if otherwise required in order to illustrate the ecology of the area within the site and any significant off-site impacts;	X
Evaluation of open land proposed within cluster, with respect to size, shape, location, natural resource value, and accessibility by residents of the Town or of the cluster;	X

<b>Part Two:</b> Description of actions that have been taken to mitigate the impacts described in Part One.	N/A
---	-----

**TOWN OF WAREHAM  
ANR/SUBDIVISION/SITE PLAN REVIEW FORM**

Check one:            ANR \_\_\_\_\_ Form B \_\_\_\_\_ Form C \_\_\_\_\_ Site Plan Review  X

Date stamped in \_\_\_\_\_ Date decision in due \_\_\_\_\_

Applicant's name(s) BE RE, LLC.c/o Adam Schumaker

Applicant's address PO Box 974 Edwards, Colorado 81632

Telephone number 385-315-0024

Address of property 0 North Carver Road Wareham and Carver, Massachusetts

Landowner's name Brett Meredith

Owner's address PO Box 359 Carver, Massachusetts 02330

Telephone number 508-726-4923

Contact person Sarah W. Stearns, PWS Telephone 508-366-0560

Map # 104 (Wareham), 128 (Carver) Lot # 1049-A, 1049-B, 1049-D, 1050 (Wareham) Zone R-60  
8-0 (Carver)

Date Approved \_\_\_\_\_ Date Denied \_\_\_\_\_

Comments (state reasons for denial or stipulations of approval)

---

---

---

---

---

---

---

---

---

---

Conditions for: \_\_\_\_\_

---

---

---

---

---

---

---

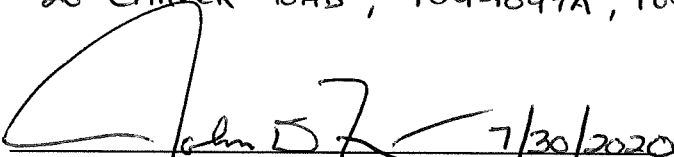
---



**PLANNING BOARD**  
**TAX VERIFICATION FORM**

This verifies that NextSun Energy, LLC. (BE RE, LLC.) (name of applicant) is up-to-date on the taxes for the property(ies) he/she owns in Wareham. If the applicant is not the current owner of the property that the application addresses, the current owner Brett Meredith (name of property owner) is up-to-date on taxes and on all properties he/she owns in the Town of Wareham.

20 CARVER ROAD, 104-1049A, 104-1049B, 104-1049D, 104-1050

  
John Foster, Tax Collector 7/30/2020

**RECORD OF PLANNING BOARD PROCEEDINGS AND DECISIONS**  
**Town of Wareham Planning Board**

Name of Subdivision or Project: Rocky Maple Solar

---

APPLICATION:        FORM A \_\_\_\_\_ FORM B \_\_\_\_\_ FORM C \_\_\_\_\_  
                          SITE PLAN REVIEW X \_\_\_\_\_ OTHER \_\_\_\_\_

DATE SUBMITTED: \_\_\_\_\_

DATE DECISION IS DUE: \_\_\_\_\_

DATE OF PUBLIC HEARING(S): \_\_\_\_\_

DECISION DATE: \_\_\_\_\_

DATE DECISION SENT TO TOWN CLERK: \_\_\_\_\_

DATE APPEALS PERIOD BEGINS \_\_\_\_\_ ENDS \_\_\_\_\_

PLANNING BOARD DECISIONS: (yes or no or abstention) if abstaining, appropriate recusal form should accompany decision.

FORM A:

M. Baptiste \_\_\_\_\_ G. Barrett \_\_\_\_\_ M. Fitzgerald \_\_\_\_\_ B. Reed \_\_\_\_\_

J. Cronan \_\_\_\_\_ A. Slavin \_\_\_\_\_

FORM B:

M. Baptiste \_\_\_\_\_ G. Barrett \_\_\_\_\_ M. Fitzgerald \_\_\_\_\_ B. Reed \_\_\_\_\_

J. Cronan \_\_\_\_\_ A. Slavin \_\_\_\_\_

FORM C:

M. Baptiste \_\_\_\_\_ G. Barrett \_\_\_\_\_ M. Fitzgerald \_\_\_\_\_ B. Reed \_\_\_\_\_

J. Cronan \_\_\_\_\_ A. Slavin \_\_\_\_\_

SITE PLAN:

M. Baptiste \_\_\_\_\_ G. Barrett \_\_\_\_\_ M. Fitzgerald \_\_\_\_\_ B. Reed \_\_\_\_\_

J. Cronan \_\_\_\_\_ A. Slavin \_\_\_\_\_

COMMENTS OR STIPULATIONS ON DECISION: \_\_\_\_\_

---

**Section 2.0**  
**Project Narrative**

---

## 2.0 PROJECT NARRATIVE

### 2.1 Introduction

The Project is located within active agricultural land located off the east side of North Carver Road in Wareham and Carver, Massachusetts. The Project is positioned between two Towns, Wareham and Carver and consist of five parcels including: 104-1049-A, 104-1049-B, 104-1049-D, 104-1050 (Wareham) and 128-8-0 (Carver) commonly owned by Rocky Maple Cranberry Co.



Aerial image of the Property.

The Property is surrounded by land in similar use associated with the agricultural cranberry bogs on the abutting Properties and significant wetland areas. Refer to the enclosed Locus and Aerial exhibits for addition details.

A Site Plan Review Approval for a large-scale ground-mounted solar energy use in the Residential R-60 District is requested pursuant to Article 3. Section 321 in the By-Law for the portion of the Property that is located within the Town of Wareham. A Special Permit with Site Plan Approval will be requested from the Carver Planning Board as well.

The  $\pm 3$  MW AC ( $\pm 7.3$  MW DC) solar array is proposed to be operational as a dual use facility installed on existing agricultural land. Access to the Property, array laydown areas, and supporting utility structures including inverters and battery storage are proposed to be located within upland areas onsite.

## 2.2 Existing Conditions

The Property is approximately 110-acres and consists mainly of active cranberry bogs and associated sand track agricultural roads and other appurtenances such as water control structures, pump houses, storage buildings, etc. Wetland cranberry bogs as well as agricultural reservoirs are present on the Property. The Property is accessed via North Carver Road, through an existing and well-maintained sand track agricultural road network on the northwest side of the Property. Existing utility poles are located along North Carver Road. Refer to the Stormwater Management Report for detailed topographic and soils information.

According to the Massachusetts Historical Commission (MHC) online database, the Massachusetts Cultural Resource Information System (MACRIS), accessed on June 5, 2020 the Property is not a historically mapped area.

The Site is not located within areas identified by the Natural Heritage and Endangered Species Program (NHESP) as Priority Habitats of Rare Species or Estimated Habitats of Rare Wildlife nor does it contain any potential or certified vernal pools.

Notices of Intent (NOI) will be filed with the Wareham and Carver Conservation Commissions for work proposed within jurisdictional wetland resource areas.

## 2.3 Proposed Conditions

The Project includes the construction, installation, and operation of a dual use, large-scale solar array and energy storage facility, including site access and interconnection to the electrical grid. The interconnection point is proposed on North Carver Road. The dual use solar array will occupy approximately 28 acres within active agricultural land located on the parcels in the Town of Wareham. In total, including the area within Carver, the dual use solar array will occupy approximately 33 acres of the 110-acre Property. The system will include appurtenant inverters and battery storage structures, as described in Section 5.0 and depicted on the plans enclosed in Section 6.0. The equipment pads will be raised to avoid impacts to the Zone AE onsite and enclosed by a 7-foot high gated security fence as detailed in the accompanying plan set.

The Project proposes to create an easement that will extend off the existing access that is currently used by the landowner to access the shop located on the west side of the Property. The extension will branch off the south side of the existing access road and jog around the south side of the shop to connect to the existing agricultural roads adjacent to the bogs. The easement access will be used while the Project is under construction as a construction entrance. The easement will also create a secondary emergency access and entrance for occasional maintenance of the array while limiting traffic along the southern side of North Carver Road. The existing access to the site in the southwestern corner of the Property will be used as a secondary access point for bog and array maintenance. Refer to the enclosed Plans for additional information regarding the proposed easement and access locations.

Existing agricultural roads on the Property will be utilized for emergency access where necessary as indicated on the plans. The sand track agricultural roads onsite have been maintained by the landowner for agricultural purposes and are not anticipated to require upgrades for construction or emergency access to the site. As discussed at the Wareham Department Head Pre-filing Meeting, the Project is not anticipated to require road upgrades and does not propose any at this time.

As required by the Wareham Zoning By-Law, where the lot abuts or is located across the street from a residential district or residential development, the front yard, rear yard, and side yard setbacks are 50-feet. The Project is surrounded by the residential district on all sides and therefore, has been designed to comply with these standards.

Dual use solar projects have been incorporated into the Massachusetts Department of Energy Resources (DOER) Solar Massachusetts Renewable Target (SMART) program. The SMART program provides financial incentives to farmers for the development of new solar photovoltaic energy sources in a manner that is compatible with ongoing agricultural practices.

### **2.3.1 Description of Work**

To preserve the ongoing cranberry operation, proposed construction techniques are designed to minimize impacts on the bogs. This includes using driven piles or helical piers to support the array racking system and limited narrow trenching for subsurface conduits that minimizes vegetation disturbance. Geotechnical borings will be conducted to determine the depth of the peat within the bogs and analyze the appropriate racking systems for the bogs. Swamp mats will be utilized during the construction phase while installing the solar array. Disturbed areas of the cranberry bogs will be repaired as necessary following construction and will continue to function as productive cranberry bogs. The appurtenant structures (inverters, converters, batteries, etc.) are proposed on raised concrete pads and enclosed by a security fence as depicted on the plans.

Single axis tracking panels are proposed above the bogs at approximately 10-15 feet high and adequately spaced to allow for continued cultivation of the shade tolerant crop. As part of the requirements for the SMART Program the solar array is only allowed as a secondary use to the agricultural component.

The proposed Project will not result in the development impacts generally associated with typical residential, commercial, or industrial development. The Project will not generate water or sewer demands, increase traffic, greenhouse gas (GHG) emissions or contribute to acid rain or smog. In fact, the Project will create a source of renewable energy without tree clearing.

*Construction Erosion and Sedimentation Control Measures*

Soil erosion is anticipated to be minimal, if any, and sedimentation control barriers will surround the work area where needed during construction. Refer to the enclosed plans for detailed depictions of the proposed erosion and sedimentation controls. Refer to Section 3.0 Post-Development Conditions of the Stormwater Management Report included in Section 4.0 of this Application for information on existing and proposed hydrology and compliance with the MassDEP Stormwater Management Policy Regulations.

*Public Safety*

The Property will continue to be privately owned and inaccessible by the public. Gates currently exist at access points and gated security fences are proposed at each of the proposed equipment pads. The current and proposed dual use agriculture/solar operations will not create an excess of traffic post-construction. The solar array will not generate greenhouse gas emissions or contribute to the other forms of pollutant, rather it will create a source of renewable energy.

*Impacts on Scenic, Natural, and Historic Resources*

The proposed array is a passive use of the land that will generate significant clean energy and has been designed to be in harmony with the ongoing agricultural cultivation and in compliance with the SMART program and local By-Laws. Tree clearing will be limited to the installation of the electrical connection and easement proposed to be located on the west side of the Property. The Project is set back and naturally buffered from public streets and residences and requires minimal site work, tree clearing grading, etc. due to the relatively level and uniform topography and existing agricultural use. Further, the project has been designed in coordination with the landowner, UMASS Cranberry Experiment Station, CCCGA and the project's agricultural consultant to minimize impacts to the farming operations to the extent feasible. As such, the implementation of the array will help sustain farming operations by providing financial support to the landowner. The Property is not considered historical by MACRIS.

*Landscaping*

As noted above, the proposed project site is set back from public streets and residences and surrounded by other agricultural properties or large wetlands systems, such that the Applicant is not proposing additional landscape plantings. Areas on the bogs disturbed during construction will be repaired, as needed.

### *Utilities*

The proposed Project includes electrical connection to the array in coordination with the Eversource utility company. As required, the electrical lines will be sited underground to the maximum extent feasible as depicted on the enclosed Plans. The electrical lines are anticipated to be connected to the existing transformers off North Carver Road. Refer to the enclosed Plans.

### *Financial Assurance for Decommissioning*

The Applicant understands the requirements set forth by the By-Law. Should the installation require decommissioning the physical removal of ground-mounted solar energy structure, equipment, transmission lines, and security fencing will be removed from the site along with any solid or hazardous waste. The site will be stabilized to prevent erosion. Bonds will be provided as deemed necessary by the Board. Refer to the enclosed Decommissioning Estimate in Section 5.0.

### *Impact Assessment*

The proposed Project is located on private property off the east side of North Carver Road and will not require any full-time staffing. The Project is not anticipated to utilize or otherwise place any burden on the Towns services, including but not limited to schools, sewer services, water systems, parks, fire, and police, while providing positive tax benefits likely in lieu of taxes (PILOT) or tax increment financing (TIF) program to be discussed with the Town. The Project is also not anticipated to increase traffic on North Carver Road. Once construction is complete, the site will be accessed by authorized personnel when maintenance is required therefore, existing traffic volumes will not be increased as a result of this Project. Lastly, the Project is proposed to be located within previously disturbed areas, which avoids increasing a disturbance footprint.

## **2.4 Compliance with Local Requirements**

The Applicant proposes this Project in accordance with MGL c. 40A, s. 3: Massachusetts Zoning law, which states that no zoning ordinance or by-law shall prohibit or unreasonably regulate solar energy systems except where necessary to protect public health, safety, or welfare. The Project is sited appropriately within active agricultural lands, adjacent to extensive wooded wetlands and agriculture in Carver and Wareham. It complies with applicable zoning criteria and does not endanger public health, safety, or welfare. The Project further complies with the local Zoning By-Law as follows:

### **2.4.1 Section 420: Flood Plain District**

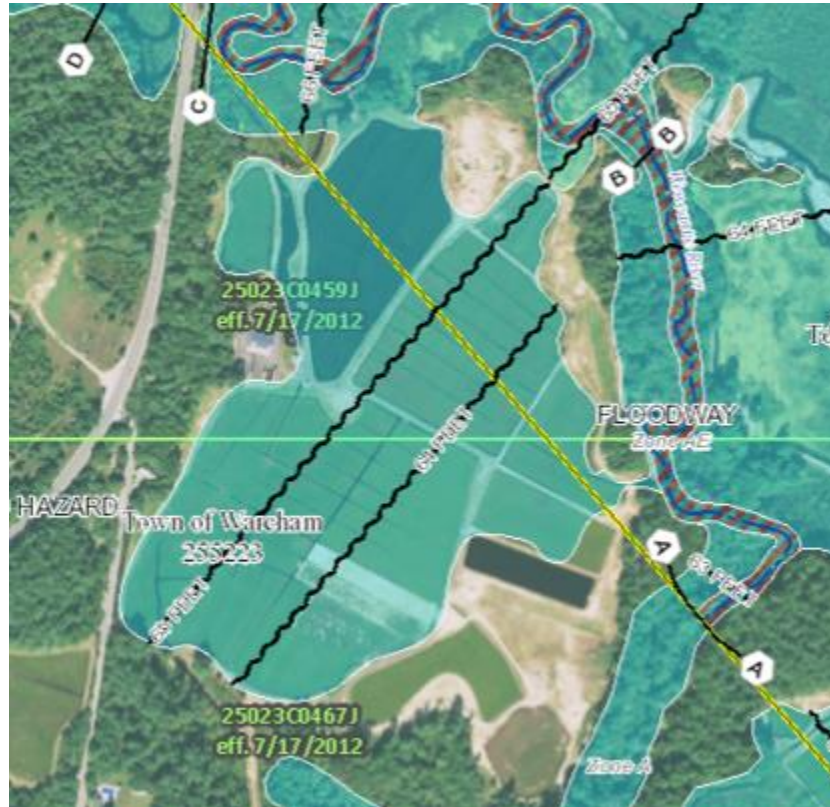
The following is a discussion of the proposed Project and the applicable standards set forth by the Wareham By-Law in Article 4, Section 420, Flood Plain District:

#### **Section 421. Development Regulations**

We have provided below the list of requested information pursuant to Section 421 of the Zoning By-Law:



*421.3 Within Zones A, AE, AO, and VE, no new construction or other land development shall be permitted unless it is demonstrated that the cumulative effect of the proposed development when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the Town.*



*FEMA panels 25023C0467J and 25023C0459J*

The Project is within actively agricultural land, portions of which are mapped as Zone AE as depicted on the FEMA Flood Insurance Rate Map Numbers 25023C0459J and 25023C0467J effective July 17, 2012. The addition of the solar array within the bogs is not proposed to create additional impacts to flood storage capacity within Zone AE greater than that of the agricultural operations that take place onsite. Equipment pads have been designed to be outside of the Flood Plain District where feasible. Additionally, the equipment pads have also been designed to be located on raised concrete sonotubes and will have negligible impacts to the area. Refer to the compensatory flood storage proposed within the Stormwater Management Report in Section 4.0.

## 2.4.2 Section 590: Solar Energy Generation Facilities

Proposed large ground-mounted solar energy facilities are required to undergo Site Plan Review under the authority of the Planning Board pursuant to Section 592.3 of the Zoning By-laws. The Project complies with the applicable requirements of Section 590 as follows:

### Section 593: Application for Site Plan Review

Compliance with Article 15: Site Plan Review of the Zoning By-laws is addressed in Section 2.4.2 herein. We have provided below the list of requested information pursuant to Section 593 of the Zoning By-laws:

*593.1 Landscape plan including sizes, types and numbers of plantings and details. Existing vegetation and other unique land features shall be preserved where feasible.*

Given the location and surrounding naturally wooded buffers, no new screening/landscaping is proposed at this time. The land features (cranberry bogs and blueberries) will be preserved to the maximum extent feasible, as proposed site work is minimal.

*593.2 Plans of the large ground-mounted solar energy facilities signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system and any potential shading from nearby structures.*

Plans stamped by a Massachusetts Professional Engineer depicting the system layout are enclosed in Section 6.0. Potential shading from nearby structures is not depicted as there are no existing structures that would shade the arrays.

*593.3 Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures.*

Given the location and surrounding naturally wooded buffers, no new screening/landscaping is proposed at this time. The land features (cranberry bogs and blueberries) will be preserved to the maximum extent feasible, as proposed site work is minimal. Refer to the project plans in Section 6.0 for further information.

*593.4 A stormwater management plan detailing the existing environmental and hydrological conditions of the site, proposed alterations of the site and all proposed components of the drainage system and any measures for the detention, retention, or infiltration of water, for the protection of water quality and protection from flooding.*

A Stormwater Management Report is enclosed in Section 4.0.

*593.5 A description of the solar energy facility and the technical, economic and other reasons for the proposed location and design shall be prepared and signed by a registered professional engineer.*

As noted throughout this narrative, many growers and the cranberry industry, in general, is facing the need for decision making regarding current and future viability of cranberry bogs in an uncertain market. Incentives offered through dual use agriculture/solar initiatives as part of the SMART Program offer a way for interested and eligible growers to continue to farm their land while adding renewable energy, ultimately providing sustainability and economic diversity.

*593.6 Confirmation prepared and signed by a registered professional engineer that the large ground-mounted solar energy facilities comply with all applicable Federal and State standards.*

The facility will comply with applicable federal and state standards.

*593.7 One- or three-line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and over current devices.*

Refer to the Solar Documentation enclosed in Section 5.0.

*593.8 Documentation of the major system components to be used, including the photovoltaic panels, mounting system, inverters.*

Refer to the enclosed Solar Documentation in Section 5.0.

*593.9 Documentation of the sound generated by equipment used in the production of electrical energy, including any proprietary documentation.*

When measured in close proximity sound levels for the proposed inverters are around 94-decibel and around 74-decibel for both the energy storage equipment and transformer; however, sound levels reduce to ambient within 200 feet. The major equipment has been strategically located throughout the project to reduce audible noise for abutting properties.

*593.10 An operation and maintenance plan (see also section 595 on decommissioning)*

An operation and maintenance plan is included in Section 5.0 Solar Documentation.

*593.11 The Planning Board may require the proponent to pay for professional services to evaluate the proposal.*

The Applicant acknowledges this requirement.

**Section 594: Design Standards**

The proposed large ground-mounted solar energy facility and appurtenant structures will comply as applicable with the standards detailed in Section 594.1, which generally addresses minimum lot size, yard depth, fencing, operation and maintenance plan, and utility company notification (evidence of notification to the utility company is included in Section 5.0 Solar Documentation). The proposed solar panels and associated equipment adhere to the required property line setbacks. Agricultural roads used for site access lie within the 50-foot zoning setback, (e.g. the westerly access road), but these are existing features. Disturbance of the 50-foot zoning setback for site access is allowed under Section 594.3.7. Please note that a waiver from the fencing requirement is requested; refer to Section 2.5 for additional detail.

Section 594.2 does not apply to the Project, as it relates to on-site solar energy facilities as an accessory use.

The Project will comply as applicable with the provisions of 594.3, which generally addresses appurtenant structures, lighting, signage, utility connections, sound, and clear-cutting of trees. Additional discussion is provided elsewhere herein for sound, visual, and tree clearing provisions.

**Section 595: Abandonment or Decommissioning**

The proposed Project will comply with the abandonment and decommissioning requirements as described in Section 595. Decommissioning information and cost estimates are included in Section 5.0 Solar Documentation. This plan also includes information regarding disposal of refuse, in concert with the purposes of Site Plan Review discussed in Section 2.4.2 herein

**2.4.3 Article 15: Site Plan Review**

The Project has been prepared with consideration of the purposes of Site Plan Review outlined in Section 1510 of the By-Law, including: protection against detrimental uses; convenience and safety of vehicular and pedestrian movement; disposal of refuse; protection of environmental features; arrangement of structures; adequacy of vehicular and pedestrian access, drainage, water supply, sewage disposal, lighting, landscaping, wetlands, water courses, buildings and other features that support the neighborhood; and compliance with applicable sections of the Zoning By-Laws. The requirements of Article 15 address conformance with the purposes listed above (with the exception of refuse, which is addressed by the decommissioning plan noted above), and therefore the applicable sections of Article 15 are discussed in additional detail below.

## Section 1530: Information Required

### *Section 1531: General Information, Section 1532: Existing Features, and Section 1533: The Development Plan*

The plans enclosed in Section 6.0 provide the applicable information noted in these sections. Please also refer to the Site Plan Review Checklist enclosed in Section 1.0 for additional detail. Please note that waivers from the plan scale, and certain existing feature requirements are requested; refer to Section 2.5 for additional detail.

### *Section 1534: Impact Statement*

#### *Part 1: Impact of the Proposed Development on...*

#### *All applicable town services including but not limited to schools, sewer service, water systems, parks, fire, and police protection*

The Project is not anticipated to have an adverse impact to municipal services such as schools, sewer service, water systems, parks, or fire/police protection. The Project is a dual use ground-mounted solar energy facility, which will generate clean, renewable energy. The Project will not generate school-age children, does not require connection to water or wastewater systems, and will require minimal, if any, fire and/or police protection. Fire and/or police protection will only be necessary should there be an emergency situation.

#### *The roads in the immediate vicinity of the proposed development*

The Project is not anticipated to have an adverse impact on the roadways in the vicinity of the Property. The Project is not anticipated to generate regular vehicle trips outside of the construction period. The Project will have an emergency/maintenance access roadway connecting to North Carver Road; however, this will only be used for maintenance or emergency situations.

#### *The ecology of the area within the site and any significant off-site impacts*

The Property is not located within areas identified by NHESP as Priority Habitats of Rare Species or Estimated Habitats of Rare Wildlife.

Proposed alterations subject to Conservation Commission jurisdiction includes temporary and permanent impacts to previously altered buffer zones and Bordering Vegetated Wetlands (i.e. wetland cranberry bogs), 200-foot Riverfront Area, and Bordering Land Subject to Flooding and are designed to avoid and minimize impacts to jurisdictional resource areas in accordance with state and local regulations. As such, Notices of Intent will be filed with the Wareham and Carver Conservation Commissions.

The Project is not anticipated to create significant individual or cumulative effects upon the resource area values. Upon completion of installation of the array system, the cranberry bogs will continue to function for commercial cranberry production.

No off-site impacts to the ecology of the area are anticipated from the Project.

*Part 2: Proposed Mitigation*

Mitigation is not proposed, as the overall anticipated impacts of this dual use agriculture/solar renewable energy project are minimal. The Project will provide benefits of its own.

**Section 1540: Evaluation Standards**

Pursuant to Section 1540, an evaluation of the listed objectives is provided for the Planning Board's consideration.

*Section 1541: Natural Features*

The Project will not impair the natural features onsite and is designed to avoid impacts to the environment to the maximum extent feasible. Tree clearing is not required to accommodate the array.

“Reduce the volume of cut and fill”

The proposed volume of cut and fill associated with the solar Project has been reduced to the extent practicable by siting it in an area that will be utilized in association with the existing agricultural operations.

“Reduce the number of removed trees”

Clearing of trees is not proposed at this time.

“Reduce the pollutants reaching the water table”

Vehicular traffic will not be regularly occurring after construction and, therefore, will not increase the potential for pollutants onsite. Sanding and salting of the access roads are not proposed.

The materials within the solar arrays are inert and, therefore, are not potential pollutants. Some inverters and batteries are solid-state with no internal fluids and will be properly housed per electric code standards to avoid potential pollution. The central inverters will contain biodegradable coolant and will be housed with appropriate oil containment measures.

There is no sewage disposal system proposed or required for the Site.

“Reduce the area of wetland vegetation displaced”

As discussed, the resource areas onsite are part of a managed agricultural operation. Wetland vegetation displacement will be minimal, if any, and areas within the commercially cultivated cranberry bogs, should they be impacted during construction, will be replanted, and restored as required for harvest to continue.

“Reduce soil erosion”

Given the level topography of the existing cranberry bog operation and road network, the Applicant anticipates minimal soil erosion as part of the project construction. That said, during construction, the Property will be managed in accordance with the Stormwater Pollution Prevention Plan included in the Stormwater Management Report in Section 4.0. The pile base to support the array structures will be hydraulically advanced into the ground to reduce the excavation and exposure of soil associated with normal construction practices.

In addition, sedimentation controls will be implemented to protect adjacent resource areas and existing infrastructure features during construction. Please refer to the Stormwater Management Report enclosed in Section 4.0 for information regarding the best management practices to be used to control soil erosion and sedimentation required by the National Pollutant Discharge Elimination System (NPDES) construction permitting program.

“Reduce the area of impervious surface”

The amount of impervious surface has been minimized by limiting impervious areas to concrete pads for the required inverters and energy storage equipment.

“Reduce the amount of stormwater runoff from the site”

Refer to Section 4.0 of this Application for a detailed plan to manage stormwater runoff.

*Section 1542: Relation of Buildings to Environment*

This section is not applicable to the Project, as no buildings are proposed.

*Section 1543: Vehicular Circulation*

The Project will not result in an increase in traffic trips to or from the Site outside of the construction period. An estimated 10-20 Workers will be traveling to and from the site during construction. The Project will be accessed from North Carver Road and will not require the construction of any new streets or access ways or the paving of existing ways on private property.

The perimeter emergency access will utilize existing sand track roads, which are currently maintained to meet requirements for heavy equipment associated with the cranberry operation.

*Subsection 1544: Pedestrian Circulation*

This section is not applicable, as the Site is not intended to be accessible to pedestrians or to the general public.

*Section 1545: Parking*

This section is not applicable, as the proposed use does not require parking spaces. There is adequate space provided on the Property for the occasional vehicle to service the facility.

*Section 1546: Landscaping*

This subsection indicates that all site plans are subject to the requirements of the Zoning By-laws. Article 10: "Landscaping", applies to all new non-residential development, pursuant to Section 1020. Pursuant to Section 1030, the Planning Board is responsible for determining acceptable landscaping standards that where not otherwise provided in Article 10.

As stated above, additional plantings are not proposed given the nature of the surrounding vegetated screening and remote setting of the Property.

## 2.5 Waiver Request

Please note that the Applicant respectfully requests the following three waivers:

**Subsection 1532:** "Existing Features" that requires that plans be at a scale of 1" = 20', 40', or 100' where practical and appropriate. Since the site is located on a large property, in order to accurately and legibly depict certain aspects of the project, plans have been submitted at various scales.

**Section 1532.1** "Plans are to include but not limited to the following...Existing Natural Features" 2. "Individual trees 18" dbh or over." Though tree clearing is limited, due to the size of the property and the character of the project, it is infeasible to locate all trees greater than 18 inches.

**Section 591.6** requiring that "All large ground-mounted solar energy facilities shall be fenced for security...". Though the Applicant proposes to fence and gate electrical equipment pads with a 7-foot high security fence, due to the dual use classification of the project including increased height of the arrays and the location of the project on the less accessible active cranberry bogs, we respectfully request a waiver from the typical fencing requirement. Further, fencing the array would create additional constraints to the required agricultural operation onsite.



**Section 3.0**  
**Parties in Interest**

---

List of Abutting Town Planning Boards  
Certified List of Abutters

### **3.0 PARTIES IN INTEREST**

In accordance with the requirements of M.G.L. Chapter 40A, a list of the addresses of Planning Boards in municipalities within the Commonwealth that abut Wareham are as follows:

Bourne Planning Board  
Bourne Town Hall  
24 Perry Avenue - Room 201  
Buzzards Bay, MA 02532-3441

Carver Planning Board  
Carver Town Hall  
108 Main Street  
Carver MA 02330

Marion Planning Board  
2 Spring Street  
Marion Town House  
Marion, MA 02738

Middleborough Planning Board  
Town Hall Annex  
20 Center Street  
Middleborough, MA 02346

Plymouth Planning Board  
26 Court Street  
Plymouth, MA 02360

Rochester Planning Board  
Town Hall Annex  
37 Marion Road  
Rochester, MA 02770

TOWN OF WAREHAM ABUTTERS				
MAP 104 LOT 1049/D				
OWNER BRETT MEREDITH				
<b>MAP &amp; LOT</b>	<b>OWNER</b>	<b>STREET ADDRESS</b>	<b>TOWN</b>	<b>STATE</b> <b>ZIP CODE</b>
103-1038	BARLOW CINDY A	19 EAST BAR LE DOC DR	CORPUS CHRISTI	TX        78414
104-1050/B	SELLON LORING W	15 N CARVER RD	W WAREHAM	MA        02576
CERTIFIED ABUTTERS AS THEY				
APPEAR ON OUR TAX ROLLS				
AS OF 12/31/2019				
ASSESSORS OFFICE				
REQUESTED BY				
CAROLINE E BOOTH				
508 366-0560				
<a href="mailto:CBBOOTH@BEALSANDTHOMAS.COM">CBBOOTH@BEALSANDTHOMAS.COM</a>				



The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.



Printed on 08/04/2020 at 03:03 PM

**MA Places**

- Fire Station
- Post Station
- Town Hall
- Public Library
- School

**Buildings**

- Parcels
- Town Boundary

**MA Highways**

- Interstate
- US Highway
- Numbered Road

**Streets**

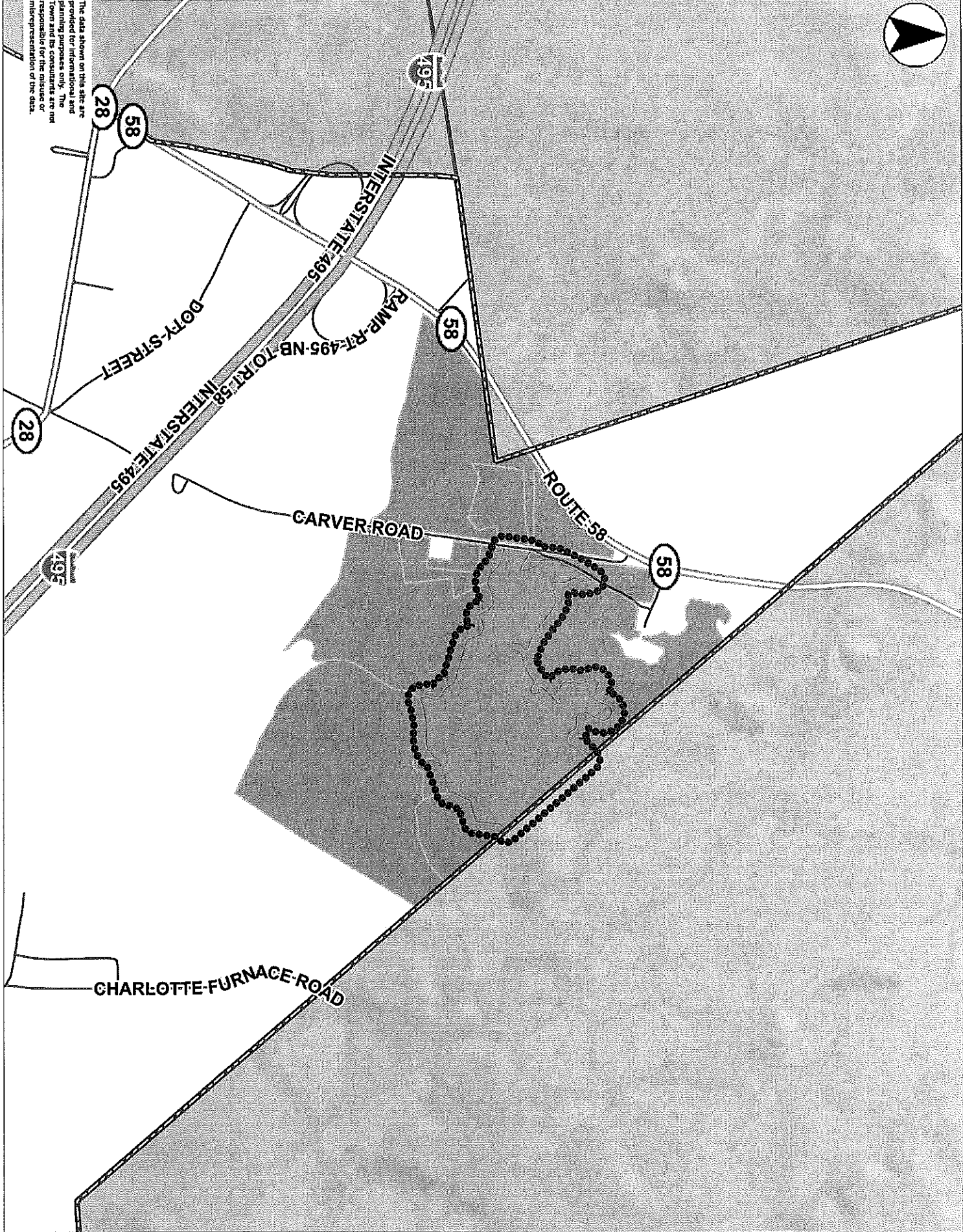
- Bathymetry
- 0-5 ft
- 5-10 ft
- 10-15 ft
- 15-20 ft
- 20-30 ft
- 30-40 ft
- 40-50 ft
- 50-60 ft
- 60-70 ft
- 70+ ft

**Abutting Town Labels**

- Abutting Towns



TOWN OF WAREHAM ABUTTERS						
MAP 104 LOT 1049/A						
OWNER BRETT MEREDITH						
<b>MAP &amp; LOT</b>	<b>OWNER</b>	<b>CO-OWNER</b>	<b>STREET ADDRESS</b>	<b>STOWN</b>	<b>STATE</b>	<b>ZIP CODE</b>
103-1019/A	RINTA PAUL E	RINTA LINDA A	34 N CARVER RD	W WAREHAM	MA	02576
103-1036	SELLON DEBORAH G		15 NORTH CARVER RD	W WAREHAM	MA	02576
104-1048/A	MCCULLEY ROBERT M		349 MAPLE ST	W BARNSTABLE	MA	02668
104-PT/A	SLOCUM-GIBBS CRANBERRY CO		PO BOX 6	S CARVER	MA	02366
CERTIFIED ABUTTERS AS						
THEY APPEAR ON OUR TAX ROLLS						
AS OF 12/31/2019						
ASSESSORS OFFICE						
REQUESTED BY						
CAROLINE E BOOTH						
508 366-0560						
<a href="mailto:CB00TH@BEALSANDTHOMAS.COM">CB00TH@BEALSANDTHOMAS.COM</a>						



The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.



Printed on 08/04/2020 at 10:58 AM

- MA Places
  - Fire Station
  - Police Station
  - Town Hall
  - Public Library
  - School
- Buildings
- Parcels
- Town Boundary
- MA Highways
  - Interstate
  - US Highway
  - Numbered Route
- Streets
- Bathymetry
  - 0-5 ft
  - 5-10 ft
  - 10-15 ft
  - 15-20 ft
  - 20-30 ft
  - 30-40 ft
  - 40-50 ft
  - 50-60 ft
  - 60-70 ft
  - 70+ ft
- Abutting Town Labels
  - Abutting Towns

CURRENT OWNER	TOPO	UTILITIES	STRT/ROAD	LOCATION	CURRENT ASSESSMENT	PREVIOUS ASSESSMENTS (HISTORY)
MEREDITH BRETT W PO BOX 359 CARVER, MA 02330 Additional Owners:					Code 7100 Description 61A LAND Appraised Value 61,300 Assessed Value 278,300	Yr. Code 2020 7100 Yr. Code 2020 7100 Assessed Value 7,600 Assessed Value 8,200
SUPPLEMENTAL DATA					925 WAREHAM, MA	

Other ID:	Total Ac	District	S.C.E.	Plan #	Assoc. Parcels	ASSOC PID#	VISION
	37.81	10					
GIS ID: M 261973 840254							

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	Q/H	W/H	SALE PRICE	V.C.	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
MEREDITH BRETT W	15064/162	05/08/2003	U	V	225,000	1G	2020	7100	7,600	2018	7100	9,500
RINTA PAUL E & LINDA A	11608/230	01/27/1993	U		622,400		2020	7160	8,200	2018	7160	8,300
Total: 15,800												

EXEMPTIONS				OTHER ASSESSMENTS				APPRAISED VALUE SUMMARY					
Year	Type	Description	Amount	Code	Description	Number	Amount	Comm. Int.	Appraised Bldg. Value (Card)	Appraised XF (B) Value (Bldg)	Appraised OB (L) Value (Bldg)	Appraised Land Value (Bldg)	Special Land Value
Total: 15,800													
ASSESSING NEIGHBORHOOD													
NBHD/SUB NBHD Name Street Index Name Tracing Batch													
0055/A													
NOTES													
Total Appraised Parcel Value 339,600													
Valuation Method: C													
Adjustment: 0													
Net Total Appraised Parcel Value 339,600													

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments	Date	Type	IS	ID	Cd	Purpose/Result
BUILDING PERMIT RECORD														
									07/02/2018			KG	04	Measur/Vacant Boarded
VISIT/CHANGE HISTORY														

B Use # Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I Factor	S.A	C. Factor	ST. Idx	Adj.	Notes-Adj	Special Pricing	S Adj Fac	Adj Unit Price	Land Value
1	7100 CRANBERRY MDL-00	1	1			3.02 AC	20,300.00	1.0000	5	1.00	0055	1.00	BOG	61A 2500	1.00		61,300
1	7160 NEC RELATED	1	1			34.79 AC	8,000.00	1.0000	5	1.00	A	1.00	UPLAND	61A 235	1.00		278,300
Total Card Land Units: 37.81 AC Parcel Total Land Area: 37.81 AC Total Land Value: 339,600																	



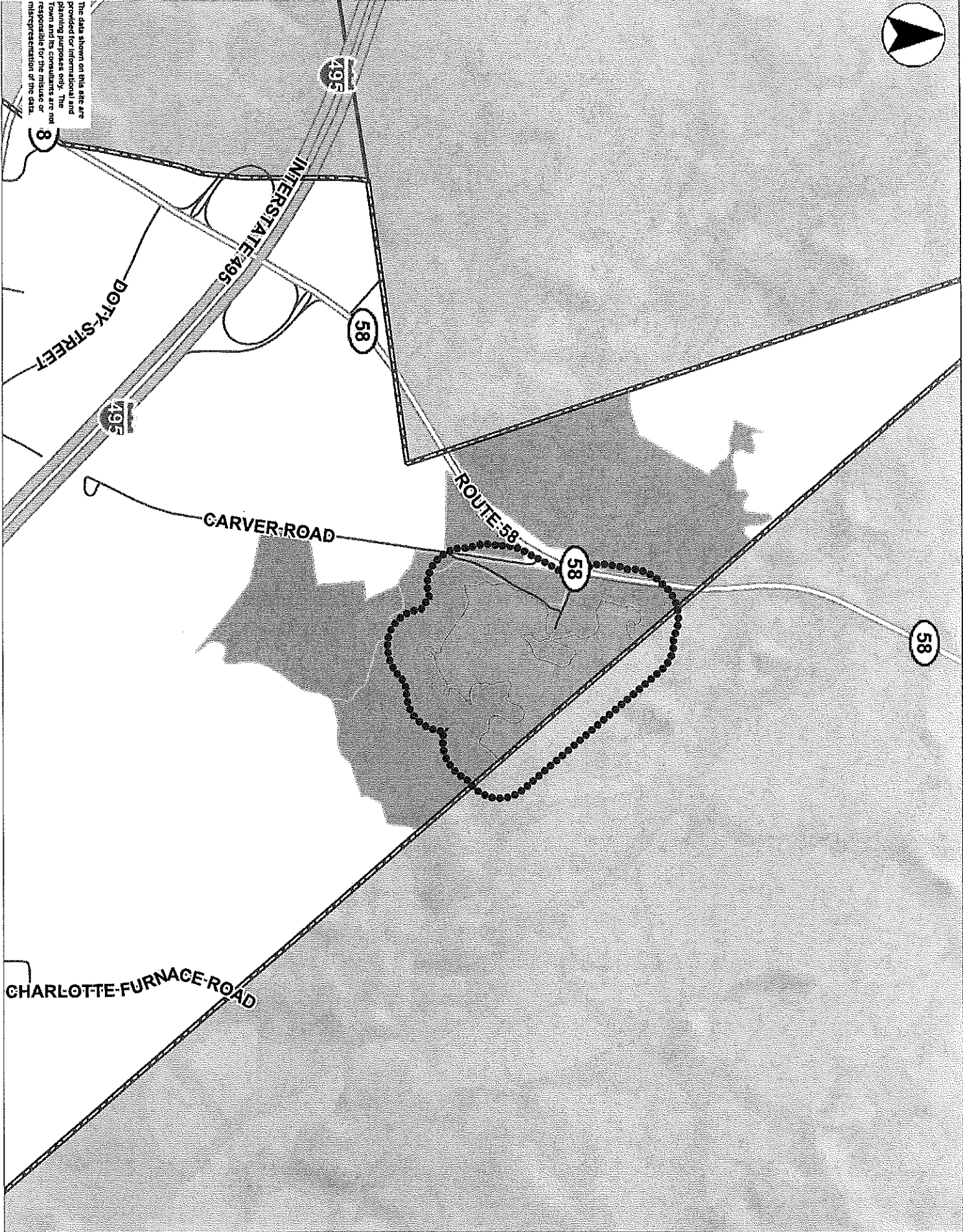




0 1400 2800 ft

Printed on 08/04/2020 at 02:48 PM

The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.



- MA Places
  - Fire Station
  - Police Station
  - Town Hall
  - Public Library
  - School
- Buildings
- Parcels
- Town Boundary
- MA Highways
  - Interstate
  - US Highway
  - Numbered Route
- Streets
- Bathymetry
  - 0-5 ft
  - 5-10 ft
  - 10-15 ft
  - 15-20 ft
  - 20-30 ft
  - 30-40 ft
  - 40-50 ft
  - 50-60 ft
  - 60-70 ft
  - 70+ ft
- Abutting Town Labels
- Abutting Towns

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION	CURRENT ASSESSMENT	PREVIOUS ASSESSMENTS (HISTORY)																																																												
MEREDITH BRETT W PO BOX 359 CARVER, MA 02330 Additional Owners:					<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> <th>Appraised Value</th> <th>Assessed Value</th> <th>Yr.</th> <th>Code</th> <th>Appraised Value</th> <th>Assessed Value</th> <th>Yr.</th> <th>Code</th> <th>Appraised Value</th> <th>Assessed Value</th> </tr> </thead> <tbody> <tr> <td>7100</td> <td>GIA LAND</td> <td>245,800</td> <td>30,300</td> <td>2020</td> <td>7100</td> <td>39,100</td> <td>29,800</td> <td>2018</td> <td>7100</td> <td>38,100</td> <td>29,800</td> </tr> <tr> <td>7100</td> <td>GIA LAND</td> <td>39,100</td> <td>39,100</td> <td>2020</td> <td>7100</td> <td>40,000</td> <td>1,200</td> <td>2018</td> <td>7100</td> <td>29,800</td> <td>1,200</td> </tr> <tr> <td>7160</td> <td>GIA LAND</td> <td>40,000</td> <td></td> <td>2020</td> <td>7160</td> <td></td> <td></td> <td>2018</td> <td>7160</td> <td></td> <td></td> </tr> <tr> <td colspan="2"><b>Total:</b></td> <td><b>324,900</b></td> <td><b>70,600</b></td> <td colspan="2"><b>Total:</b></td> <td><b>70,600</b></td> <td><b>61,300</b></td> <td colspan="2"><b>Total:</b></td> <td><b>69,100</b></td> <td><b>61,300</b></td> </tr> </tbody> </table>	Code	Description	Appraised Value	Assessed Value	Yr.	Code	Appraised Value	Assessed Value	Yr.	Code	Appraised Value	Assessed Value	7100	GIA LAND	245,800	30,300	2020	7100	39,100	29,800	2018	7100	38,100	29,800	7100	GIA LAND	39,100	39,100	2020	7100	40,000	1,200	2018	7100	29,800	1,200	7160	GIA LAND	40,000		2020	7160			2018	7160			<b>Total:</b>		<b>324,900</b>	<b>70,600</b>	<b>Total:</b>		<b>70,600</b>	<b>61,300</b>	<b>Total:</b>		<b>69,100</b>	<b>61,300</b>	925 WAREHAM, MA
Code	Description	Appraised Value	Assessed Value	Yr.	Code	Appraised Value	Assessed Value	Yr.	Code	Appraised Value	Assessed Value																																																							
7100	GIA LAND	245,800	30,300	2020	7100	39,100	29,800	2018	7100	38,100	29,800																																																							
7100	GIA LAND	39,100	39,100	2020	7100	40,000	1,200	2018	7100	29,800	1,200																																																							
7160	GIA LAND	40,000		2020	7160			2018	7160																																																									
<b>Total:</b>		<b>324,900</b>	<b>70,600</b>	<b>Total:</b>		<b>70,600</b>	<b>61,300</b>	<b>Total:</b>		<b>69,100</b>	<b>61,300</b>																																																							

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	W/H	W/I	SALE PRICE	V.C.	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	
MEREDITH BRETT W RINTA PAUL E & LINDA A	25064/162 11608/230	05/08/2003 01/27/1993	U U	I	225,000 627,600	IG	2020	7100	30,300	2019	7100	38,100	
<b>Total:</b>		<b>ASSOC PID#</b>		<b>ASSOC PID#</b>		<b>Total:</b>		<b>70,600</b>		<b>Total:</b>		<b>69,100</b>	

EXEMPTIONS	OTHER ASSESSMENTS	APPRaised VALUE SUMMARY								
Year	Type	Description	Amount	Code	Description	Number	Amount	Comm. Int.	Appraised Bidg. Value (Card)	0
									Appraised XF (B) Value (Blgd)	0
									Appraised OB (L) Value (Blgd)	39,100
									Appraised Land Value (Blgd)	0
									Special Land Value	285,800
									Total Appraised Parcel Value	324,900
									Valuation Method:	C
									Adjustment:	0
									Net Total Appraised Parcel Value	324,900

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments	Date	Type	IS	ID	Cd	Purpose/Result
R18-491	12/06/2017	SOL	Solar Panels	25,694	04/24/2018	100	07/02/2018 04/24/2018	28 SOLAR PANELS				KG SC	01 06	Measured & Notice Building Permit

BUILDING PERMIT RECORD	LANDLINE VALUATION SECTION

B Use Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I	Factor	S.A.	C	ST	Adi.	Notes-Adi	Special Pricing	S Adi	Fac	Adi	Unit Price	Land Value																		
1	CRANBERRY MDL-001	R60	1			12.11 AC	20,300.00	1.0000	5	1.00	0055	1.00	BOGS	61A	2500	1.00			1.00	245,800																		
1	NEC RELATED	R60	1			5.00 AC	8,000.00	1.0000	5	1.00	A	1.00	UPLAND	61A	235	1.00			1.00	40,000																		
<b>Total Card Land Units:</b>																				17.11 AC	<b>Parcel Total Land Area:</b>		17.11 AC	<b>Total Land Value:</b>		285,800												

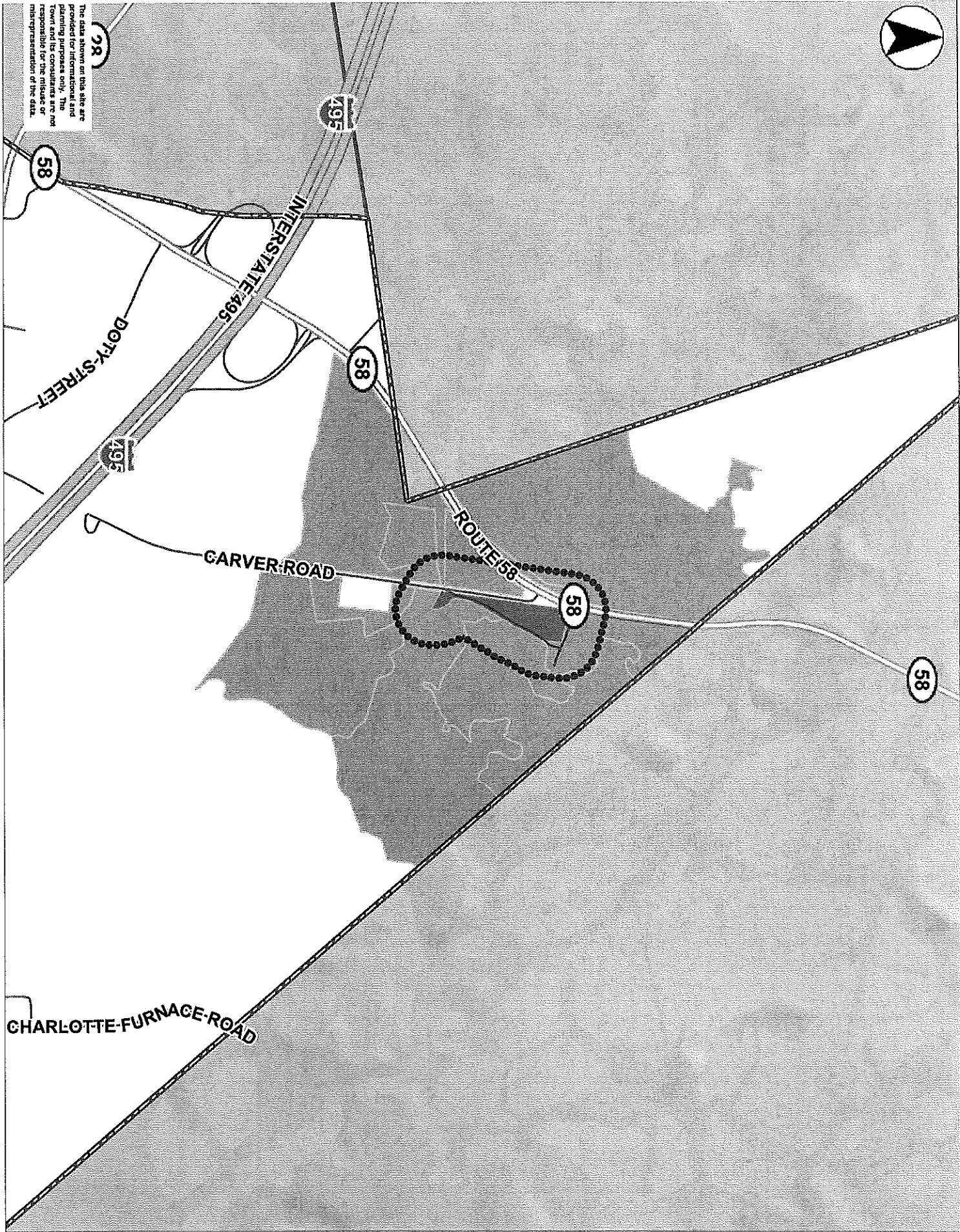
TOWN OF WAREHAM ABUTTERS						
MAP 104 LOT 1050/A						
OWNER BRETT MEREDITH						
<b>MAP &amp; LOT</b>	<b>OWNER</b>	<b>CO-OWNER</b>	<b>STREET ADDRESS</b>	<b>TOWN</b>	<b>STATE</b>	<b>ZIP CODE</b>
103-1019/A	RINTA PAUL E	RINTA LINDA A	34 N CARVER RD	W WAREHAM	MA	02576
103-1038	BARLOW CINDY A		19 EAST BAR LE DOC DR	CORPUS CHRISTI	TX	78414
103-1036	SELLON DEBORAH G		15 NORTH CARVER RD	W WAREHAM	MA	02576
104-1050/B	SELLON LORING W		15 N CARVER RD	W WAREHAM	MA	02576
CERTIFIED ABUTTERS AS						
THEY APPEAR ON OUR TAX ROLLS						
AS OF 12/31/2019						
ASSESSORS OFFICE						
REQUESTED BY						
CAROLINE E BOOTH						
CBOOTH@BEALSANDTHOMAS.COM						



0 1400 2800 ft

Printed on 08/04/2020 at 02:56 PM

The data shown on this site are provided for informational and planning purposes only. This Town and its consultants are not responsible for the misuse or misrepresentation of the data.



- MA District
- Fire Station
- Police Station
- Town Hall
- Public Library
- School
- Buildings
- Parcels
- Town Boundary
- MA Highways
- Interstate
- US Highway
- Numbered Route
- Streets
- Bathymetry
  - 0-5 ft
  - 5-10 ft
  - 10-15 ft
  - 15-20 ft
  - 20-30 ft
  - 30-40 ft
  - 40-50 ft
  - 50-60 ft
  - 60-70 ft
  - 70+ ft
- Abutting Town Labels
- Abutting Towns

<b>CURRENT OWNER</b> MEREDITH BRETT W PO BOX 359 CARVER, MA 02330 Additional Owners:	<b>TOPO</b>	<b>UTILITIES</b>	<b>STRT/ROAD</b>	<b>LOCATION</b>	<b>CURRENT ASSESSMENT</b>	<b>PREVIOUS ASSESSMENTS (HISTORY)</b>	<b>VISION</b>
					61A LAND Code 7200 Appraised Value 27,500 Assessed Value 100	Yr. Code 100 Yr. Code 2019 Yr. Code 7200 Assessed Value 100 Assessed Value 2018 Assessed Value 7200	925 WAREHAM, MA

<b>SUPPLEMENTAL DATA</b>	<b>ASSOC PID#</b>	<b>VISION</b>
Other ID: Total Ac 3.44 District 13 S.C.E. GIS ID: M_261511_840494	Plan # 1 & 31-1994 Assoc. Parcels	

<b>RECORD OF OWNERSHIP</b>	<b>BK-VOL/PAGE</b>	<b>SALE DATE</b>	<b>SALE PRICE</b>	<b>V.C.</b>	<b>Yr. Code</b>	<b>Assessed Value</b>	<b>Yr. Code</b>	<b>Assessed Value</b>	<b>Yr. Code</b>	<b>Assessed Value</b>
MEREDITH BRETT W RINTA PAUL E & LINDA A	25064/173 11608/230	05/08/2003 01/27/1993	175,000 622,400	Q U	2020 7200	100 2019 7200	100 2018 7200	100 2018 7200		100
<b>Total:</b>						27,500		100		100

<b>EXEMPTIONS</b>	<b>OTHER ASSESSMENTS</b>	<b>APPRaised VALUE SUMMARY</b>
Year Type Description Amount Code Description Number Amount Comm. Int.		Appraised Bldg. Value (Card) 0 Appraised XE (B) Value (Bldg) 0 Appraised OB (L) Value (Bldg) 0 Appraised Land Value (Bldg) 0 Special Land Value 27,500 Total Appraised Parcel Value 27,500 Valuation Method: C Adjustment: 0 Net Total Appraised Parcel Value 27,500

<b>ASSESSING NEIGHBORHOOD</b>	<b>NOTES</b>
NBHD/STB 0040/A NBHD Name Street Index Name Tracting Batch	

<b>BUILDING PERMIT RECORD</b>	<b>VISIT/CHANGE HISTORY</b>
Permit ID Issue Date Type Description Amount Insp. Date % Comp. Date Comp. Comments	Date Type IS ID CD Purpose/Result
	07/02/2018 KG 04 Measur/Vacant Boarded
	08/30/2004 SS

<b>LAND LINE VALUATION SECTION</b>	<b>UNIT PRICE</b>	<b>UNIT VALUE</b>
Use Code Description Zone D Front Depth Units Unit Price Factor S.A. Factor C. ST. Adj. Notes-Adj.		
1 7200 NONPRNEC1D R60 1 1 1.00 AC 8,000.00 1.0000 5 1.00 A 1.00		8,000
1 7200 NONPRNEC1D R60 1 1 2.44 AC 8,000.00 1.0000 5 1.00 A 1.00		19,500
<b>Total Card Land Units:</b> 3.44 AC	<b>Parcel Total Land Area:</b> 3.44 AC	<b>Total Land Value:</b> 27,500



**TOWN OF CARVER  
BOARD OF ASSESSORS**

108 Main Street  
Carver, Massachusetts 02330  
Telephone (508) 866-3410  
Fax (508) 866-7401

*Cranberry Land USA*

August 5, 2020

NextSun Energy, LLC c/o Sarah Stearns  
144 Turnpike Road Suite 210  
Southborough, MA 01772  
508-366-0560  
cbooth@bealsandthomas.com

Location of Property: 0 Tremont Street, Map 128, Parcels 7,8

To Whom It May Concern:

I certify that the attached is a list of persons who are owners of abutting property, owners of land directly opposite of any public or private street or way; and abutters and all other land owners within 300 feet of the property line of owner's property, all as they appear on the most recent applicable tax list (M.G.L. c. 40A, Section 11 Zoning Code Chapter 40A Section 139-29B(2)).

Two sets of labels are included for your use.

Yours truly,

A handwritten signature in cursive script, appearing to read "Peter Loughman".

Peter Loughman  
Finance Assistant

Enclosures



# TOWN OF CARVER BOARD OF ASSESSORS

Telephone (508) 866-3410 -- Fax [508] 866-7401

*Cranberry Land USA*

## CERTIFIED ABUTTER'S LIST REQUEST

The Assessor's Office will certify the names and mailing addresses of all abutters. The fee for this service is subject to the Fee Schedule.

The office has **10** days to complete this request.

Applicant: NextSun Energy, LLC c/o Sarah Stearns

Mailing Address: 144 Turnpike Road Suite 210

Southborough, MA 01772

Telephone: 508-366-0560 Email: cbooth@bealsandthomas.com

Location of Property: 0 Tremont Street

Map: 128 Lot: 8,7 Key #

For:  Board of Selectmen

x Conservation Commission (100')

Zoning Board of Appeals

x Planning Board (300')

<u>Map / Lot</u>	<u>Map / Lot</u>	<u>Map / Lot</u>
<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>
<u></u>	<u></u>	<u></u>

Note: Once a certified abutter's list request is complete – the certification is only good for 30 days from the date on the letter.

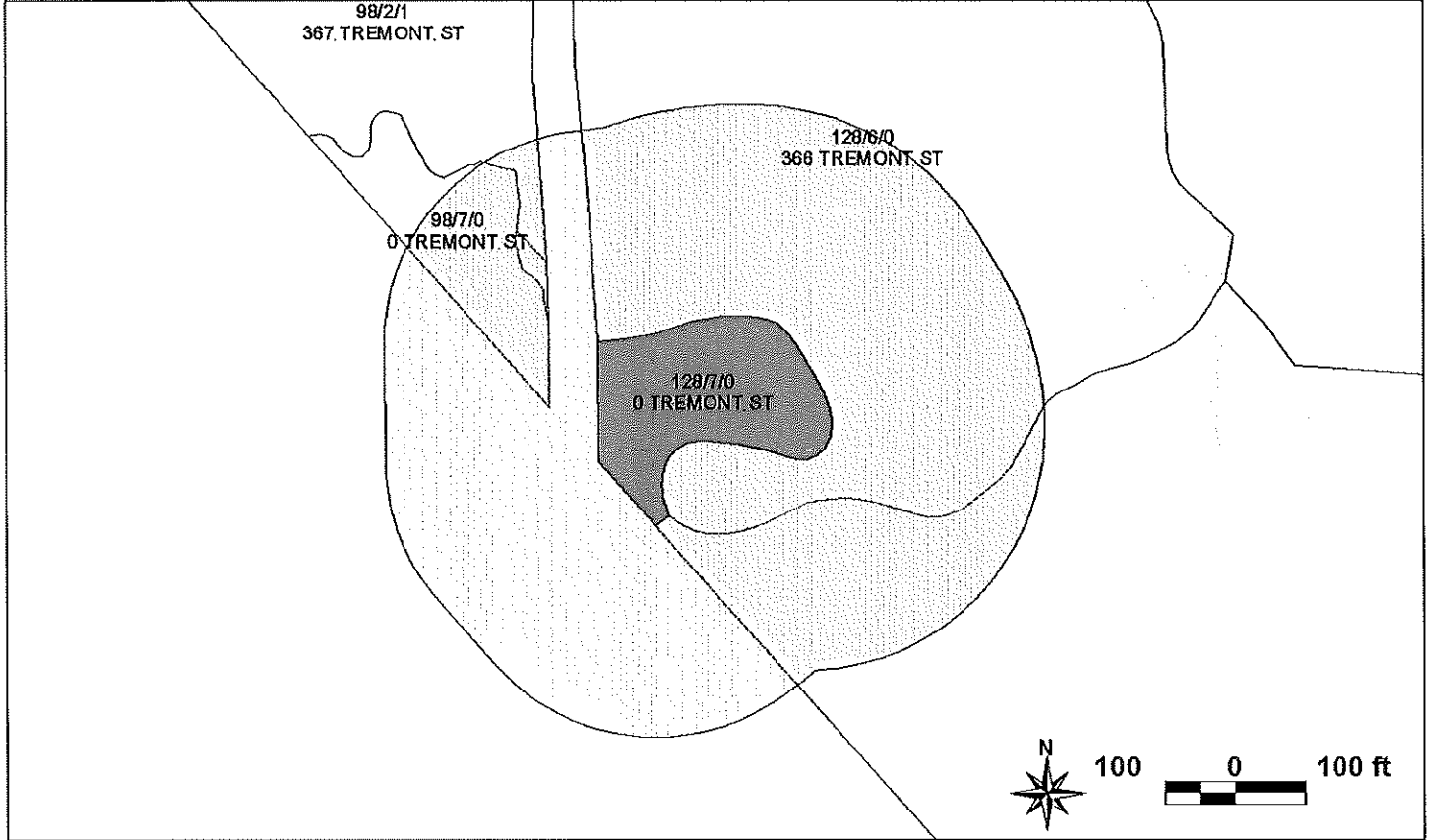
I DO NOT HAVE A MEETING DATE BEFORE THE BOARD CHECKED ABOVE BUT WILL CALL TO ACTIVATE THIS REQUEST ONCE I KNOW THE DATE OF MY HEARING/MEETING.





TOWN OF CARVER, MA  
 BOARD OF ASSESSORS  
 108 MAIN ST, CARVER, MA 02330

Abutters List Within 300 feet of Parcel 128/7/0

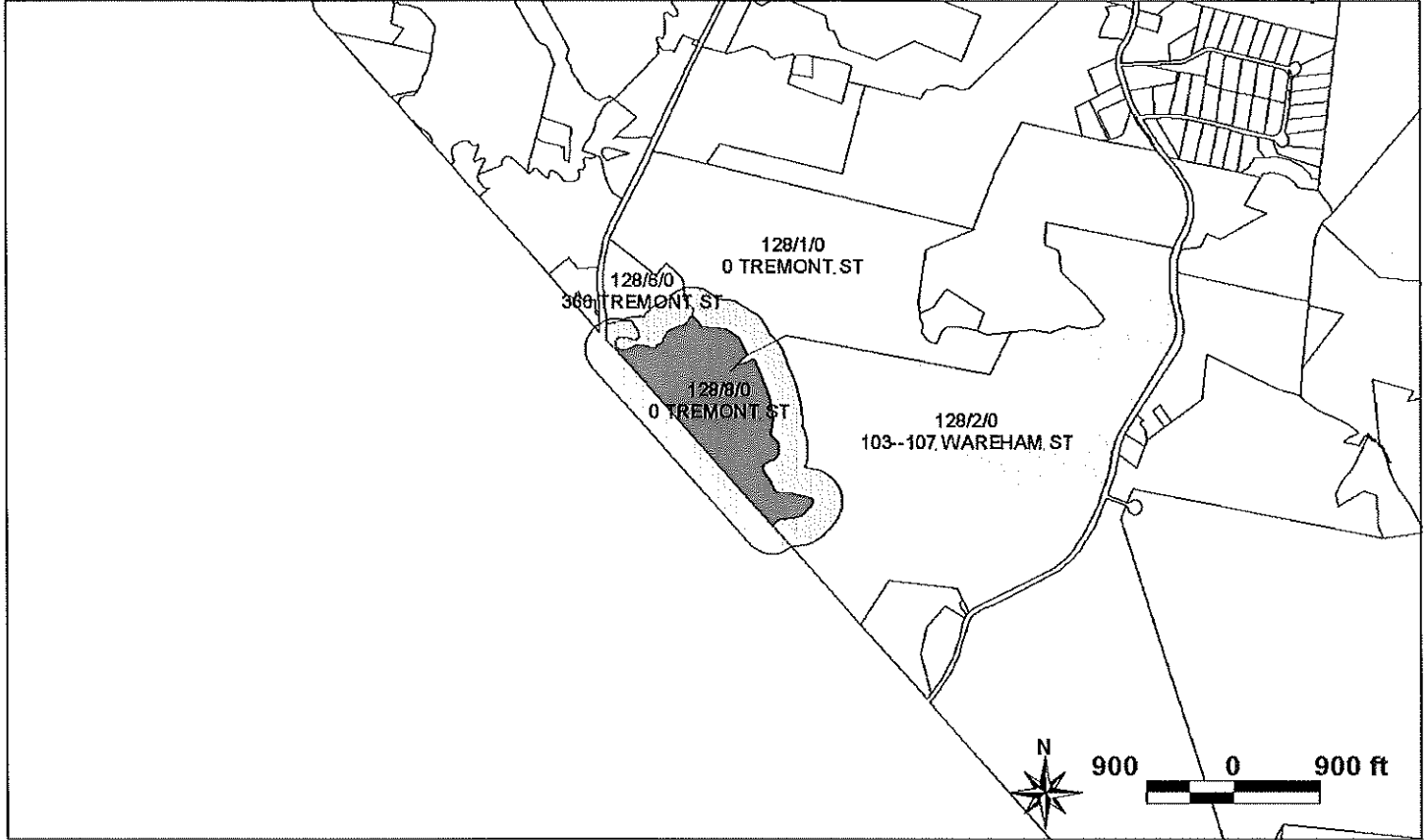


Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
5644	98-2-1-R	JOHNSON NATHAN D PEACOCK JENNIFER L	367 TREMONT ST	367 TREMONT ST	CARVER	MA	02330
4042	98-7-0-R	BARLOW CINDY A	0 TREMONT ST	19 EAST BAR LeDOC DR	CORPUS CHRISTI	TX	78414
4043	98-8-0-E	OWNER UNKNOWN	0 TREMONT ST	TREMONT ST	CARVER	MA	02330
1139	128-6-0-R	KENDRICK CHRISTY G KENDRICK SCOTT	366 TREMONT ST	366 TREMONT ST	CARVER	MA	02330
1140	128-7-0-R	MEREDITH BRETT W	0 TREMONT ST	PO BOX 359	CARVER	MA	02330
1141	128-8-0-R	MEREDITH BRETT W	0 TREMONT ST	PO BOX 359	CARVER	MA	02330



TOWN OF CARVER, MA  
 BOARD OF ASSESSORS  
 108 MAIN ST, CARVER, MA 02330

Abutters List Within 300 feet of Parcel 128/8/0



Key	Parcel ID	Owner	Location	Mailing Street	Mailing City	ST	ZipCd/Country
4042	98-7-0-R	BARLOW CINDY A	0 TREMONT ST	19 EAST BAR LeDOC DR	CORPUS CHRISTI	TX	78414
1133	128-1-0-R	SLOCUM GIBBS CRANBERRY CO	0 TREMONT ST	PO BOX 6	SOUTH CARVER	MA	02366
1137	128-2-0-R	SLOCUM GIBBS CRANBERRY CO	103-107 WAREHAM ST	PO BOX 6	SOUTH CARVER	MA	02366
1139	128-6-0-R	KENDRICK CHRISTY G KENDRICK SCOTT	366 TREMONT ST	366 TREMONT ST	CARVER	MA	02330
1140	128-7-0-R	MEREDITH BRETT W	0 TREMONT ST	PO BOX 359	CARVER	MA	02330
1141	128-8-0-R	MEREDITH BRETT W	0 TREMONT ST	PO BOX 359	CARVER	MA	02330

96-8-0-R

FITCH KENNETH A  
FITCH JOANNE  
20 JABEZ BRIDGE ROAD  
CARVER, MA 02330

98-2-1-R

JOHNSON NATHAN D  
PEACOCK JENNIFER L  
367 TREMONT ST  
CARVER, MA 02330

98-8-0-E

OWNER UNKNOWN  
TREMONT ST  
CARVER, MA 02330

128-1-0-R

SLOCUM GIBBS CRANBERRY CO  
PO BOX 6  
SOUTH CARVER, MA 02366

128-2-0-R

SLOCUM GIBBS CRANBERRY CO  
PO BOX 6  
SOUTH CARVER, MA 02366

128-6-0-R

KENDRICK CHRISTY G  
KENDRICK SCOTT  
366 TREMONT ST  
CARVER, MA 02330

128-7-0-R

MEREDITH BRETT W  
PO BOX 359  
CARVER, MA 02330

128-8-0-R

MEREDITH BRETT W  
PO BOX 359  
CARVER, MA 02330

**Section 4.0**  
**Stormwater Management Information**

---

Checklist for Stormwater Report  
Stormwater Management Report  
*(Under Separate Cover)*

**Section 5.0**  
**Site Photographs**

---

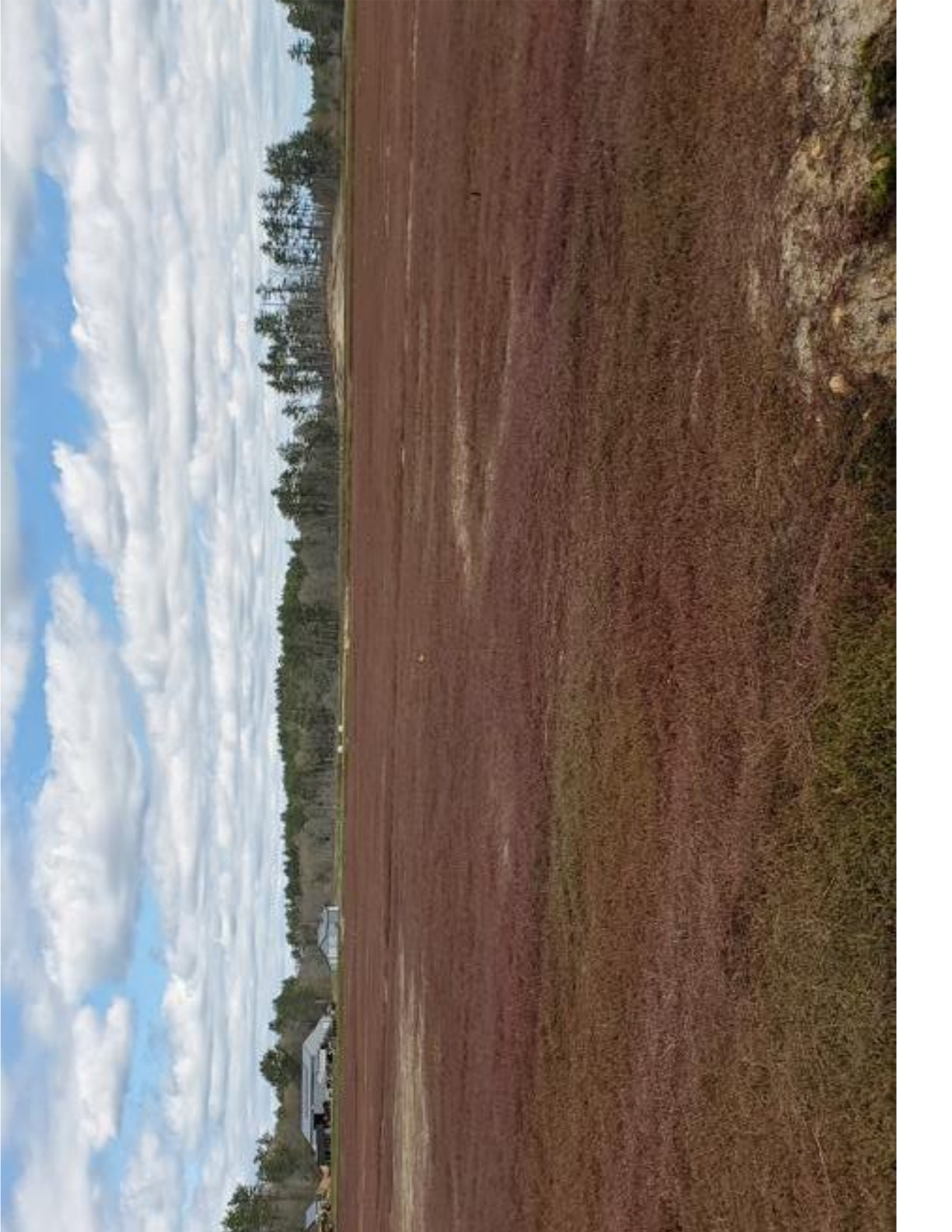














## **Section 6.0**

### **Dual Use Agricultural/Solar Documentation**

---

Operations and Maintenance Plan

Decommissioning Plan

Proof of Notification to Utility Company

Documentation of Major System Components

One-Line Electrical Diagram

SMART Program Guideline: Agricultural Solar Tariff Generation Units (ASTGU)

## OPERATION AND MAINTENCE SERVICES SCOPE OF WORK

<i>Service Description</i>	<i>Frequency / Response Time</i>
<b>INVERTER PREVENTATIVE MAINTENANCE</b>	
1. Per inverter manufacturer's guidelines: inspect and clean interior of inverter, inspect air filter, replace or clean air filter, inspect seals and replace if necessary, complete visual inspection of electrical connections and wiring, complete mechanical inspection of connections and wiring, re-torque electrical connections as needed, IR scan of inverter connections, wiring, and electronics.	1x per year
2. Clean and change inverter air filters per manufacturer's warranty requirements.	1x per year
3. Clean and remove dust from inverter heat sinks per manufacturer's warranty requirements.	1x per year
4. Clean inverter cabinet air vents, per inverter manufacturer's guidelines	1x per year
5. Check torque marks and re-tightening appropriate wiring connections to design specification torque force per manufacturer's guidelines.	1x per year
6. Perform thermal imaging and address connections and hot spots	1x per year
7. Replace AC and DC transient voltage surge suppression systems, per inverter manufacturer's guidelines (if applicable – pricing based on time and material)	Every 5 years
a. Replace blowers, replace seals, per inverter manufacturer's guidelines (pricing based on time and material)	Every 10 years
<b>MAINTENANCE REPORTING</b>	
1. Provide written maintenance report within 15 days of site visit	See below

## OPERATION AND MAINTENCE SERVICES SCOPE OF WORK

2. Include details of preventive maintenance work, such as meter readings, thermal images, and system testing results.	1x per year
3. Include non-conformance reports to identify potential short-term and long-term power production issues.	1x per year
4. Include work orders for non-conformances	1x per year
5. Perform open circuit voltage testing on 10% of the system array.	1x per year
6. Visual inspect modules and combiner boxes.	1x per year
EMERGENCY RESPONSE	
1. Contractor will be available by e-mail and by 24x7x365 Technical Phone Support hotline	Ongoing
2. Dispatch commitment: dispatch resources in response to alarms and alerts/service requests received by Contractor from Owner through Contractor's Technical Phone Support.	See below
EQUIPMENT REPAIR / REPLACEMENT	
1. Panel replacement. In the event that a panel is identified as underperforming or damaged, panel will be removed and replaced with a same or similar panel. This involves simply unscrewing the affected panel from the rack and replacing with a new panel.	As required
2. Inverter repair/replacement. In the event of inverter underperformance, Inverter Manufacturer representatives will be contacted to fix or replace damaged components.	As required
3. Medium Voltage equipment repair/replacement. In the event of failure of or damage to medium voltage equipment, including power poles and medium voltage cabling, facility will be disconnected from power grid and affected equipment will be removed and replaced in the same manner it was installed. The facility will not restart operations until the necessary repairs are complete.	As required

# NextSun Rocky Maple 7.3MWdc Solar PV System Decommissioning Plan

October 21, 2020

Prepared For

**NextSun Energy**  
97 Main St, E206  
Edwards, CO 81632

By



NEO Virtus Engineering, Inc.  
410 Great Road, B-6  
Littleton, MA 01460  
[www.neovirtus.com](http://www.neovirtus.com)  
(978) 952-2444



## **Table of Contents**

<b>1</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>4</b>
<b>2</b>	<b>ARRAY COMPONENT DECOMMISSIONING PROCEDURES.....</b>	<b>4</b>
2.1	PV MODULE REMOVAL AND RECYCLING COMPANIES.....	4
2.2	SINGLE-AXIS TRACKER REMOVAL AND RECYCLING COMPANIES.....	5
2.3	DRIVEN STEEL PILE REMOVAL AND RECYCLING COMPANIES .....	5
2.4	WIRING REMOVAL AND RECYCLING COMPANIES.....	5
2.5	INVERTER REMOVAL AND RECYCLING COMPANIES .....	6
2.6	TRANSFORMER REMOVAL AND RECYCLING COMPANIES .....	6
2.7	ENERGY STORAGE SYSTEM REMOVAL AND RECYCLING COMPANIES .....	7
2.8	UTILITY POLE REMOVAL AND RECYCLING COMPANIES.....	7
2.9	FENCING REMOVAL AND RECYCLING COMPANIES.....	8
2.10	LAND RESTORATION.....	8
<b>3</b>	<b>COST ANALYSIS .....</b>	<b>8</b>
3.1	PHOTOVOLTAIC MODULE AND SINGLE-AXIS TRACKER REMOVAL COST AND RECYCLING BENEFIT .....	8
3.2	DRIVEN STEEL PILE REMOVAL COST AND RECYCLING BENEFIT .....	9
3.3	WIRING REMOVAL COST AND RECYCLING BENEFIT .....	10
3.4	INVERTER AND TRANSFORMER REMOVAL COST .....	11
3.5	ENERGY STORAGE SYSTEM REMOVAL COST AND RECYCLING BENEFIT .....	11
3.6	UTILITY POLE REMOVAL COST.....	11
3.7	FENCING REMOVAL COST AND RECYCLING BENEFIT.....	12
3.8	LAND RESTORATION COST .....	12
3.9	REMOVAL COST AND RECYCLING BENEFIT SUMMARY.....	12
<b>4</b>	<b>CONCLUSION.....</b>	<b>14</b>
<b>5</b>	<b>ATTACHMENTS .....</b>	<b>15</b>
5.1	HYDROSEEDING ESTIMATES .....	15
5.2	SCRAP PRICES .....	16
5.3	POST REMOVAL FOR RACK PILE REMOVAL COMPARISON.....	18
5.4	FENCE REMOVAL.....	19
5.5	CONCRETE PAD REMOVAL.....	20
5.6	TRANSFORMER SALVAGE VALUE.....	21
5.7	FENCE SALVAGE VALUE.....	22
5.8	MODULE AND RACKING REMOVAL ESTIMATE .....	23
5.9	UTILITY POLE REMOVAL ESTIMATE.....	25





## List of Tables

Table 1: Solar Module Recyclers.....	5
Table 2: Steel Recyclers .....	5
Table 3: Wire Recyclers .....	6
Table 4: Electronics recycling company .....	6
Table 5: Transformer recycling companies.....	6
Table 6: Lithium-ion battery recycling company .....	7
Table 7: Utility pole recycling company .....	7
Table 8: Fencing removal company .....	8
Table 9: Removal cost and salvage benefit analysis in 2020 .....	13
Table 10: Removal cost and salvage benefit analysis in 2040.....	13



## **1 Executive Summary**

NEO was contracted by NextSun Energy to document decommissioning procedures and associated cost estimates for a 7.3MWdc solar array off North Carver Rd in Wareham, Massachusetts. NEO utilized existing manufacturer decommissioning documentation whenever possible. Costs were estimated at current 2020 rates, however these rates will likely vary from current estimates at the future time of decommissioning. Cost estimates will be subject to inflation, changes in labor rates, and changes in commodity pricing.

The solar array constructed on North Carver Rd is located within an active cranberry bog and has a footprint of approximately 28 acres of land. The array consists of photovoltaic modules mounted on Array Technologies single axis tracking racking system fixed to the earth using driven steel piles or helical piers. The array ac system consists of four 750kWac inverters.

## **2 Array Component Decommissioning Procedures**

### **2.1 PV module removal and recycling companies**

At the completion of useful PV module lifecycle, many useful materials can be reclaimed from the modules through recycling. While currently there are limited recycling facility options in the US, some do currently exist and their numbers are expected to grow as PV generation facilities end their useful lives in the coming years. Companies currently offering PV recycling services include:



## NEO Virtus Engineering, INC.

Recycle PV	Partner with European PV Cycle to transfer US modules to European recycling facilities
Cleanlites Recycling	Offers recycling of pv modules, pv tracking systems, and energy storage systems
Dynamic Lifecycle Innovations	Offers solutions for solar panel recycling and reuse
Echo Environmental	Offers recycling of excess, used, and liquidation solar equipment including modules and inverters

**Table 1: Solar Module Recyclers**

### 2.2 Single-axis tracker removal and recycling companies

The single-axis tracking system is constructed of steel. Recycling facilities offering services of steel recycling are many. A few local steel recyclers include:

Schnitzer Steel	Attleboro, MA
Mattuchio Scrap Metal	Everett, MA
Miller Recycling Corporation	Mansfield, MA
Windfield Alloy	Lawrence, MA

**Table 2: Steel Recyclers**

### 2.3 Driven steel pile removal and recycling companies

Companies and specialized equipment exist which specialize in removal of steel driven piles. Once removed, the steel piles can be recycled at a local steel recycler.

### 2.4 Wiring removal and recycling companies

Wiring buried in trenches must be pulled out of the ground and overhead wiring taken down. Aluminum and copper can be extracted from used wire and recycled. Some wire recycling companies include:



## NEO Virtus Engineering, INC.

One Way Recycling	Taunton, MA
Atlantic Metal Recycling	Hanson, MA
Sims Metal Management	Providence, RI
State Line Scrap Co Inc	Attleboro, MA

**Table 3: Wire Recyclers**

### 2.5 Inverter removal and recycling companies

The inverter sits on a skid which will facilitate removal. Additionally, there will be no concrete pads requiring removal. The electronics within the inverter will be recyclable at an electronics recycler and the steel enclosure may be recycled at a steel recycler.

Trident Electronics Recycling	Salem, MA
Reliable Asset Recovery	Nashua, NH
Surplus Technology Solutions LLC	Acton, MA
East Coast Electronics Recycling	Shirley, MA

**Table 4: Electronics recycling company**

### 2.6 Transformer removal and recycling companies

The transformer is located on the same skid as the inverter and can be recycled at a transformer recycler:

Transformer Removal Services	Worcester, MA
Clean Harbors	Woburn, MA
Eastern Environmental Technologies	Westport, CT

**Table 5: Transformer recycling companies**



## NEO Virtus Engineering, INC.

### 2.7 Energy storage system removal and recycling

#### companies

The energy storage system consists of lithium ion batteries. Currently, there are few recyclers specializing in the disposal of lithium ion batteries. However, as lithium ion based energy storage continues to grow in the solar and automotive industries, more options for lithium ion recycling are expected to be coming online. Additionally, the US Department of Energy recently announced that it plans to invest \$20.5 million in lithium-ion battery recycling. Some currently existing lithium ion recycling companies include:

Rockaway Recycling	Rockaway, NJ
Battery Resourcers	Worcester, MA
Kinsbursky Brothers Inc	Anaheim, CA
Lithion	Anjou, Quebec, Canada
Li-Cycle	Mississauga, Ontario, Canada

**Table 6: Lithium-ion battery recycling company**

### 2.8 Utility pole removal and recycling companies

Utility poles are often treated with chemicals and have to be disposed of properly. Some companies that list utility pole disposal are:

McConnell Enterprises, Inc	Braintree, MA
Northern Tree Sales & Service	Palmer, MA
National Salvage & Service Corporation	Bloomington, IN
Cox Recovery	Greenville, SC

**Table 7: Utility pole recycling company**



## **2.9 Fencing removal and recycling companies**

Fence companies which specialize in fence installation can also be contracted to remove fences.

Reliable Fence	Woburn, MA
Post and Rail Fence Company	Mansfield, MA
National Fence and Supply	Attleboro, MA
Colonial Fence Company	Norfolk, MA

**Table 8: Fencing removal company**

## **2.10 Land restoration**

Existing cranberry bog roads will be utilized for solar array access roads so these will remain after decommissioning. Cranberry vines which were injured during pile removal or other decommissioning processes will be restored. Existing staff at cranberry bog can be utilized for vine restoration.

# **3 Cost analysis**

## **3.1 Photovoltaic module and single-axis tracker removal cost and recycling benefit**

The number of solar modules is 18,036. NEO obtained a single electrician estimate (see Attachment 5.8) for both pv module and tracker removal of \$421,163.



## **NEO Virtus Engineering, INC.**

Scrap value of recycled pv modules is approximated at \$0.05 per watt. Using a 400 watt module gives a total value of \$360,720.

The tracking system utilizes a circular tube on which the pv modules mount in portrait. This would mean that the total length of the mounting tube will be equal to the total number of modules times each module width. A typical 72 cell module including spacing between modules will occupy approximately 1 meter in width. Therefore, the tracker circular mounting tube would be approximately 18,036 meters in length. Scrap value of recycled steel circular tube can be approximated from total tube length of 18,036 m and tube weight 10lb per meter for total weight of 24,990lb. At current scrap value of \$0.10 per pound, the total scrap value of the tubing would be \$18,036.

### **3.2 Driven steel pile removal cost and recycling benefit**

Steel piles are driven at intervals of every eight modules in width in the array row. Using the approximate number of modules in the array of 18,036 would mean that approximately 2,254 driven steel piles require removal. Mass DOT construction cost estimator website gives an average median value of pile removal of \$26.89 per pile. There are 2,254 piles which gives a removal cost of \$60,610.

Assuming driven steel piers sit 4ft above grade and 6ft below grade, then each has a length of 10ft for a total length for all the piers of 22,540. If each pier weighs 10 lb per foot then the total approximate weight of all the steel piers would be 225,400lb. Using the steel scrap value of \$0.10 per pound, the total approximate scrap value of the driven steel piers would be \$22,540.



### **3.3 Wiring removal cost and recycling benefit**

Total length of above ground low voltage wiring can be approximated to be equal to the total module width which is 18,036m or 59,173ft. Assuming aboveground homerun wiring is #12 copper, and weight of #12 copper is about 20lb per 1000ft, then total weight is 1,183lb. Scrap value of copper is \$2.45 per pound for a total scrap value of \$2,899.

The total length of all medium voltage underground conductors at the site can be approximated from design drawing to be 135ft. Assuming medium voltage underground wiring in trench is #1 aluminum with a weight of 0.1 lb aluminum per ft, then total weight would be about 14lb. Scrap value of aluminum wire is approximately \$0.74 per pound for a total value of \$17.

The total length of all medium voltage aboveground conductors at the site can be approximated from design drawing to be 1593ft. Assuming medium voltage aboveground wiring is #1 aluminum with a weight of 0.1 lb aluminum per ft, then total weight would be about 159lb. Scrap value of aluminum wire is approximately \$0.74 per pound for a total value of \$118.

Cost of removal of above ground LV wiring can be approximated from a labor rate of \$50 per hour and a time of 400ft per hour for a total expense of \$7,397.

Cost of removal of MV underground wiring can be approximated using a combined labor and machine rental rate \$150 per hour at a time of 200ft per hour for a total expense of \$101.





## **NEO Virtus Engineering, INC.**

Cost of removal of MV aboveground wiring can be approximated using a combined labor and machine rental rate \$150 per hour at a time of 200ft per hour for a total expense of \$1195.

### **3.4 Inverter and transformer removal cost**

Inverter and transformer will sit on a skid which can be lifted onto a flatbed truck and transported for recycling. Inverter removal and transport is approximated as \$2,000 per skid. With a total of four skids, the removal cost will be \$8,000.

### **3.5 Energy storage system removal cost and recycling benefit**

Energy storage system is located in a cargo container which can be loaded onto a truck and transported to recycling facility. Estimated costs of transport to facility are \$2,000 per container. With a total of 6 skids, the removal cost will be \$12,000.

Lithium-ion batteries containing cobalt have salvage value at \$1.30 per pound. Assuming a 30MWh energy storage system and using lithium-ion density of 82Wh/lb gives a total weight of 365,854lb for a total salvage value of \$475,610.

### **3.6 Utility pole removal cost**

The design drawing shows a total of 16 utility poles to be located at the site. If the cost of removal, transport, and proper disposal for each pole is \$1,000, then the total cost will be \$16,000.



### **3.7 Fencing removal cost and recycling benefit**

The inverter and battery storage area will be fenced. Total approximate fenced area is 28 acres or 1,219,680 sqft. If we were to assume that the fenced area was square then the fence length would equal four times the square root of the fenced in area which equals 4,418ft. Cost of fence removal is given on Mass DOT website (see Attachment 5.4) as \$10.15 per ft for a total of \$44,838.

Weight of fence per foot can be approximated at 3.15lb per foot at length of 4,348ft gives approximate weight of 13,915lb for a steel scrap value of \$0.10 per pound gives steel scrap value of \$1,392.

### **3.8 Land restoration cost**

Land restoration of cranberry vines is estimated from land area of 28 acres and 1 laborer at \$50 per hour at an approximate time of 0.125 acre/hour which gives a total cost of \$11,200.

### **3.9 Removal cost and recycling benefit summary**

Calculations of removal and salvage in prior sections are summarized in the tables below. An inflation rate of 2.75% was assumed for 2040 estimates. The total benefit of decommissioning the system after all removal costs and salvage values are totaled is \$280,785 in 2020 or \$514,100 in 2040.



## NEO Virtus Engineering, INC.

Item	Total Removal Cost 2020 (\$)	Total salvage value 2020 (\$)	Net cost 2020 (\$)
PV module & Racking	421,163	360,720	-60,443
Steel pile	60,610	22,540	-38,070
Inverter and transformer	8,000	0	-8,000
Energy storage system	12,000	475,610	463,610
Utility pole	16,000	0	-16,000
Above ground LV wire	7,397	2,899	-4,497
Below ground MV wire	101	10	-91
Above ground MV wire	1,195	118	-1,077
Fence	44,838	1,392	-43,447
Land Restoration	11,200	0	-11,200
<b>Total</b>	<b>582,504</b>	<b>863,289</b>	<b>280,785</b>

**Table 9: Removal cost and salvage benefit analysis in 2020**

Item	Total Removal Cost 2040 (\$)	Total salvage value 2040 (\$)	Net cost 2040 (\$)
PV module	724,581	620,593	-103,988
Racking	0	31,030	31,030
Steel pile	104,275	38,778	-65,497
Inverter and transformer	13,763	0	-13,763
Energy storage system	20,645	818,253	797,607
Utility pole	27,527	0	-27,527
Above ground LV wire	12,725	4,988	-7,737
Below ground MV wire	174	17	-157
Above ground MV wire	2,055	203	-1,853
Fence	77,141	2,394	-74,747
Land Restoration	19,269	0	-19,269
<b>Total</b>	<b>1,002,156</b>	<b>1,516,256</b>	<b>514,100</b>

**Table 10: Removal cost and salvage benefit analysis in 2040**



**NEO Virtus Engineering, INC.**

## **4 Conclusion**

All costs and salvage values are approximate. It is currently conceivable that the scrap value of array components at time of decommissioning will partly or even completely offset the cost of system removal.



## 5 Attachments

### 5.1 Hydroseeding Estimates

Price Guide

Quality Hydroseed  
Worcester, MA

[Home](#)

**Our 2019 Hydroseeding Price Guide:**

(Pricing may vary by location, and is subject to change without notice.)

**Hydroseeding minimum charge, Small yard / Spot Treatments \* \$450**

(Includes up to 400 gal. of hydroseed mixture or about 4,000 sq. ft. of coverage. Larger hydroseeding projects are billed by the square foot. Please see our 2015 hydroseed pricing below.)

**Hydroseed Application for New Lawn / Lawn Renovation**

*(cost of hydroseeding per square foot)*

*This is just a "guide", please call (508) 852-2035 for a Free Estimate!*

- 2,000 - 19,000 square feet\* \$0.10 *per square foot*
- 19,001 - 43,560 square feet\* \$0.08 *per square foot*
- Over 1 acre!\* \$0.07 *per square foot*
- Over 5 acres\* \$2,860 *per acre*
- Over 10 acres\* *call*
- Over 20 acres\* *call*
- Over 50 acres\* *call*
- Over 100 acres\* *call*

**Larger projects (over 10 acres), please call for pricing!**

\*All applicable taxes will be added to final invoice and are not reflected in the above referenced prices.



# NEO Virtus Engineering, INC.

## 5.2 Scrap Prices

**Access the Platform**

ScrapMonster has become North America's largest scrap trading platform with 65,000 members and the trusted source for scrap prices, news, and information. Join Today!

First Name  Last Name  Email Address  **REGISTER FREE TODAY!**

Home / Scrap Metal Prices / Steel / Structural Steel Scrap Price

**SCRAP MATERIALS**

- Aluminum Scrap
- Brass/Bronze
- Copper Scrap
- Cupro-Nickel
- Electronics Scrap
- Lead Scrap
- Scrap Gold Prices (Hallmarked)
- Scrap Gold Prices (Non-Hallmarked)
- Stainless Steel
- Steel

**SMI NORTH AMERICA** | SMI CHINA | SMI INDIA | SMI EUROPE

### Structural Steel Scrap Price

ISRI CODE : NA  
Category : Steel

**210.00** \$US/MT -5 -2.33%

24 Jun 2020

LTP	Price Change	Change%	Month High-Low	Year High-Low
210.00 \$US/MT	-5	-2.33%	368.00 - 195.00	255.00 - 190.00

**Access the Platform**

ScrapMonster has become North America's largest scrap trading platform with 65,000 members and the trusted source for scrap prices, news, and information. Join Today!

First Name  Last Name  Email Address  **REGISTER FREE TODAY!**

Home / Scrap Metal Prices / Copper Scrap / #1 Copper Wire and Tubing Scrap Price

**SCRAP MATERIALS**

- Aluminum Scrap
- Brass/Bronze
- Copper Scrap
- Cupro-Nickel
- Electronics Scrap
- Lead Scrap
- Scrap Gold Prices (Hallmarked)
- Scrap Gold Prices (Non-Hallmarked)
- Stainless Steel
- Steel

**SMI NORTH AMERICA** | SMI CHINA | SMI INDIA | SMI EUROPE

### #1 Copper Wire and Tubing Scrap Price

ISRI CODE : CANDY  
Category : Copper Scrap

**2.45** \$US/Lb -0.01 -0.41%

24 Jun 2020

LTP	Price Change	Change%	Month High-Low	Year High-Low
2.45 \$US/Lb	-0.01	-0.41%	3.56 - 1.89	2.97 - 1.87



# NEO Virtus Engineering, INC.

**Access the Platform**

ScrapMonster has become North America's largest scrap trading platform with 65,000 members and the trusted source for scrap prices, news, and information. Join Today!

First Name  Last Name  Email Address  **REGISTER FREE TODAY!**

Home / Scrap Metal Prices / North America / Electronics Scrap / Lithium-Ion Battery Scrap Price

**SCRAP MATERIALS**

- Aluminum Scrap
- Brass/Bronze
- Copper Scrap
- Cupro-Nickel
- Electronics Scrap
- Lead Scrap
- Scrap Gold Prices (Hallmarked)
- Scrap Gold Prices (Non-Hallmarked)
- Stainless Steel
- Steel

**SMI NORTH AMERICA** | SMI USA EAST COAST | SMI USA MIDWEST | SMI USA WEST COAST

## Lithium-Ion Battery Scrap Price

ISRI CODE : NA  
Category : [Electronics Scrap](#)

**▶ 1.30** \$US/Lb 0  
0%

24 Jun 2020

LTP	Price Change	Change%	Month High-Low	Year High-Low
<b>1.30</b> \$US/Lb	<b>0</b>	<b>0%</b>	<b>1.95 - 0.70</b>	<b>1.30 - 1.30</b>

**Access the Platform**

ScrapMonster has become North America's largest scrap trading platform with 65,000 members and the trusted source for scrap prices, news, and information. Join Today!

First Name  Last Name  Email Address  **REGISTER FREE TODAY!**

Home / Scrap Metal Prices / Aluminum Scrap / E.C. Aluminum Wire Scrap Price

**SCRAP MATERIALS**

- Aluminum Scrap
- Brass/Bronze
- Copper Scrap
- Cupro-Nickel
- Electronics Scrap
- Lead Scrap
- Scrap Gold Prices (Hallmarked)
- Scrap Gold Prices (Non-Hallmarked)
- Stainless Steel
- Steel

**SMI NORTH AMERICA** | SMI CHINA | SMI INDIA | SMI EUROPE

## E.C. Aluminum Wire Scrap Price

ISRI CODE : NA  
Category : [Aluminum Scrap](#)

**▼ 0.74** \$US/Lb -0.04  
-5.13%

14 Jul 2020

LTP	Price Change	Change%	Month High-Low	Year High-Low
<b>0.74</b> \$US/Lb	<b>-0.04</b>	<b>-5.13%</b>	<b>0.98 - 0.14</b>	<b>0.82 - 0.64</b>



### 5.3 Post removal for rack pile removal comparison

Massachusetts Department of Transportation - Highway Division

**Construction Project Estimator**

Highway Home   MassDOT Home   Mass.Gov Home   State Agencies   State Online Services

#### Line Item Information

Item No: **632.3**  
 Item Description: **INDIVIDUAL POST REMOVED AND STACKED**  
 Measurement System: **English**  
 Unit: **EA**  
 Unit price statistics computed for Period: **10/2017 - 10/2020**

#### Unit price quantity breakouts

Min Quantity	Max Quantity	District	Unit Price Statistics					
			No. of Projects	No. of Bids	Minimum	Maximum	Mean	Median
<b>10.00 (EA)</b>	<b>10.00 (EA)</b>	All Districts	<u>1</u>	8	\$15.00	\$45.00	\$26.89	\$27.75
		3	<u>1</u>	8	\$15.00	\$45.00	\$26.89	\$27.75





## 5.4 Fence removal

Massachusetts Department of Transportation - Highway Division

**Construction Project Estimator**

[Highway Home](#)  
 [MassDOT Home](#)  
 [Mass.Gov Home](#)  
 [State Agencies](#)  
 [State Online Services](#)

### Line Item Information

Item No: **665.**  
 Item Description: **CHAIN LINK FENCE REMOVED AND STACKED**  
 Measurement System: **English**  
 Unit: **FT**  
 Unit price statistics computed for Period: **10/2019 - 10/2020**

### Unit price quantity breakouts

Min Quantity	Max Quantity	District	Unit Price Statistics					
			No. of Projects	No. of Bids	Minimum	Maximum	Mean	Median
<b>10.00 (FT)</b>	<b>87.50 (FT)</b>	All Districts	<u>1</u>	3	\$12.50	\$37.50	\$24.00	\$25.00
		2	<u>1</u>	3	\$12.50	\$37.50	\$24.00	\$25.00
<b>87.50 (FT)</b>	<b>165.00 (FT)</b>	All Districts	<u>1</u>	5	\$5.00	\$15.00	\$9.40	\$10.00
		4	<u>1</u>	5	\$5.00	\$15.00	\$9.40	\$10.00
<b>552.50 (FT)</b>	<b>630.00 (FT)</b>	All Districts	<u>2</u>	9	\$5.50	\$16.50	\$10.89	\$10.00
		3	<u>2</u>	9	\$5.50	\$16.50	\$10.89	\$10.00

--



# NEO Virtus Engineering, INC.

## 5.5 Concrete pad removal

### Line Item Information

Item No: **127.**  
 Item Description: **CONCRETE EXCAVATION**  
 Measurement System: **English**  
 Unit: **CY**  
 Unit price statistics computed for Period: **10/2019 - 10/2020**

### Unit price quantity breakouts

Min Quantity	Max Quantity	District	No. of Projects	No. of Bids	Unit Price Statistics			
					Minimum	Maximum	Mean	Median
<b>2.00 (CY)</b>	<b>476.75 (CY)</b>	All Districts	<u>8</u>	38	\$100.00	\$300.00	\$178.05	\$177.50
		1	<u>3</u>	12	\$97.50	\$292.50	\$190.42	\$189.00
		2	<u>2</u>	6	\$122.50	\$367.50	\$190.00	\$175.00
		3	<u>1</u>	10	\$90.00	\$270.00	\$135.00	\$127.50
		4	<u>2</u>	8	\$75.00	\$225.00	\$130.96	\$117.49
<b>476.75 (CY)</b>	<b>951.50 (CY)</b>	All Districts	<u>3</u>	9	\$42.50	\$127.50	\$89.89	\$85.00
		3	<u>1</u>	5	\$46.25	\$138.75	\$91.00	\$85.00
		4	<u>1</u>	3	\$53.50	\$160.50	\$93.00	\$107.00
		5	<u>1</u>	2	\$0.01	\$0.02	\$0.01	\$0.01
<b>3325.25 (CY)</b>	<b>3800.00 (CY)</b>	All Districts	<u>1</u>	5	\$37.00	\$111.00	\$69.88	\$74.00
		1	<u>1</u>	5	\$37.00	\$111.00	\$69.88	\$74.00



## NEO Virtus Engineering, INC.

### 5.6 Transformer salvage value



Fri 11/15/2019 5:41 PM

Clayton Saunderson <clayton@maddoxtransformer.com>

Re: Buy back quote

To James Bing

Cc Robert

Hi James,

Thanks for reaching out.

If it were happening today, it could range anywhere from nothing (you paying us to haul it off and scrap), all the way up to \$2K.

I hope that helps, but outside of that, I wouldn't be able to issue a formal quote for 25 years from now.

Best regards,



**Clayton Saunderson**  
Inventory Manager, Maddox Industrial Transformer  
clayton@maddoxtransformer.com  
Direct: 360-450-3641  
[Check out our new factory in WA](#)



# NEO Virtus Engineering, INC.

## 5.7 Fence salvage value

### Galvanized Chain Link Fence Fabric (GBW)

#### 1 inch, 2 inch and 3 1/2 x 5 inch Diamond Chain Link Fence

**Chain link fence wire thickness**  
(The higher the gauge the thinner the wire.)

- 6 Gauge 0.192"
- 9 Gauge 0.148"
- 10 Gauge 0.130"
- 11 Gauge 0.120"
- 11 1/2 Gauge 0.113"



**Chain Link Specifications:**

- 1.2 ounce coating - GBW
- RR-F-191/1D
- ASTM - A-392
- AASHTO - M-181

[On-line Quote - Complete Chain Link Fence System \(click here\)](#)

Chain Link Galvanized 2" Diamond 11 Gauge	Weight (lbs) Per Foot	Price Per Foot Chain Link Only
36 (3' high)	1.36	\$1.60
42 (3 1/2' high)	1.60	\$1.87
48 (4' high)	1.80	\$2.15
60 (5' high)	2.30	\$2.67
72 (6' high)	2.75	\$3.21
84 (7' high)	3.15	\$3.75
96 (8' high)	3.65	\$4.28
120 (10' high)	4.55	\$5.36
144 (12' high)	5.45	\$6.42

Chain Link Galvanized 2" Diamond 9 Gauge	Weight (lbs) Per Foot	Price Per Foot Chain Link Only
36 (3' high)	2.10	\$2.40
42 (3 1/2' high)	2.50	\$2.79
48 (4' high)	2.80	\$3.19
60 (5' high)	3.50	\$3.99
72 (6' high)	4.20	\$5.28
96 (8' high)	5.60	\$6.39
120 (10' high)	7.00	\$7.99
144 (12' high)	8.40	\$9.58



# NEO Virtus Engineering, INC.

## 5.8 Module and Racking removal estimate

10/4/2020 7:21:52 PM

Page 1

ROCKY MAPLE

Totals (Summary) - Bid Summary: Default

<b>Material</b>	
Non-Quoted	\$0.00
Quotes	1,803.60
Sales Tax (0.00%)	0.00
<b>Total Material</b>	<b>\$1,803.60</b>
<b>Labor</b>	
Direct (901.80 hours @ \$44.70)	\$40,312.71
Non-Productive Labor	0.00
<b>Total Labor</b>	<b>\$40,312.71</b>
Direct Job Expenses	\$0.00
Tools and Miscellaneous Materials	0.00
Subcontracts	0.00
<b>Job Subtotal (Prime Cost)</b>	<b>\$42,116.31</b>
Overhead (0.00%)	0.00
Profit (0.00%)	0.00
<b>Job Total</b>	<b>\$42,116.31</b>
<b>Actual Bid Price</b>	<b>\$42,116.31</b>
<b>Material to Direct Labor ratio: 0.04</b>	
Prime Cost per square foot	\$0.00
Job Total per square foot	\$0.00
Actual Bid Price per square ft	\$0.00
Labor cost per square foot	\$0.00
Labor hours per square foot	\$0.00



# NEO Virtus Engineering, INC.

10/7/2020 7:39:18 AM

Page 1

**ROCKY MAPLE**  
Totals (Detailed) - Bid Summary: Default

Job Number	19
Bid Date	10/4/2020
Bid Time	7:17:00 PM
Square Footage	0

**Quoted Material**

1 - Fixtures (Supplier #1)	\$1,803.80
<b>Total</b>	<b>\$1,803.80</b>
<b>Sales Tax (0.00%)</b>	<b>\$0.00</b>
<b>Total Material</b>	<b>\$1,803.80</b>

**Labor Hours**

Division	Total	Factor	Extended
04 Light Fixtures & Lamps	901.80	0.00 %	901.80
<b>Total</b>	<b>901.80</b>		<b>901.80</b>

**Labor Rates**

Category	% of Total	Hours	Base Rate	Burden \$	Burden %	Extended
Journeyman	3.000	27.054	\$85.00	22.75	35.000	\$2,373.99
Helper	91.000	820.638	25.00	15.00	60.000	32,825.52
Foreman	8.000	54.108	70.00	24.50	35.000	5,113.21
<b>Total</b>	<b>100.000</b>	<b>901.800</b>				<b>x \$44.70 (average of labor rate w/burden) = \$40,312.71</b>

**Non-Productive Labor**

Description	Hours	Rate	Factor	Extended
<b>Total</b>				<b>\$0.00</b>
<b>Total Labor</b>				<b>\$40,312.71</b>
<b>Job Subtotal (Prime Cost)</b>				<b>\$42,116.31</b>
<b>Overhead (0.00%)</b>				<b>0.00</b>
<b>Profit (0.00%)</b>				<b>0.00</b>
<b>Job Total</b>				<b>\$42,116.31</b>
<b>Actual Bid Price</b>				<b>\$42,116.31</b>
Material to Direct Labor ratio: 0.04				
Prime Cost per square foot				<b>\$0.00</b>



## NEO Virtus Engineering, INC.

### 5.9 Utility pole removal estimate

**From:** David Wirzbicki <[dwirzbicki@lelwd.com](mailto:dwirzbicki@lelwd.com)>  
**Sent:** Tuesday, November 26, 2019 1:41 PM  
**To:** James Bing <[jbings@neovirtus.com](mailto:jbings@neovirtus.com)>  
**Subject:** RE: Wood Pole Disposal

Jim

We have Northern Tree Service out of Palmer Mass pick up our old poles and the last time it was \$155.00 per ton. I hope this will help you.

Dave

---

**From:** Sylvia Hidden Kirker, McConnell Enterprises Inc. [mailto:[mcc.shk@verizon.net](mailto:mcc.shk@verizon.net)]  
**Sent:** Monday, December 2, 2019 3:04 PM  
**To:** 'James Bing'  
**Cc:** 'Robert'  
**Subject:** RE: Utility pole & concrete slab proposal

Jim,

Here is the current pricing on telephone pole disposal. Not providing pricing on concrete pads at this time. Thank you.

#### **Telephone Pole Disposal 4 ft minus lengths**

The only option offered for telephone pole disposal is for McConnell to provide a container/Dumpster at the site to be loaded by the customer.

Scope of Work: Provide container at site to transport and dispose of telephone poles at a licensed facility. Telephone poles must be cut to 4-foot minus.

Cost: \$320 per ton with an 8-ton minimum = \$2,560 minimum

COD cash or check upon delivery

A disposal weight slip will be provided to the customer.

*Sylvia Hidden Kirker*  
*McConnell Enterprises, Inc.*

©2020 NEO Virtus Engineering, Inc.  
Decommissioning Report

25 of 26

Rocky Maple  
Wareham, MA



## **NEO Virtus Engineering, INC.**

*10 Icehouse Lane, PO Box 187*

*Essex, MA 01929*

*Office: 978-768-6078*

*Cell: 978-758-2951*

*[mcc.shk@verizon.net](mailto:mcc.shk@verizon.net)*

*Providing: Demolition, Environmental Remediation and Scrap Metal Recycling*





**Generating Facility Expedited/Standard Process  
Interconnection Application**

**Contact Information:**

Date Prepared: August 9, 2018

Legal Name and address of Interconnecting Customer

Interconnecting Customer (print): BE RE, LLC Contact Person: Adam Schumaker

Mailing Address: 50 W. Broadway, #700

City: Salt Lake City State: UT Zip Code: 84109

Telephone (Daytime): 385-315-0024 (Evening): 385-315-0024

Facsimile Number: 617-440-7554 E-Mail Address: aschumaker@nextsunenergy.com

Customer name (if Customer is not Interconnecting Customer) \_\_\_\_\_

Customer email: \_\_\_\_\_ Customer telephone: \_\_\_\_\_

Customer Mailing Address:

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Landowner name (if neither Interconnecting Customer nor Customer) Brett Meredith

Landowner email: rockymaplebogs@comcast.net Landowner telephone: 508-726-4923

Landowner Mailing Address: PO Box 359

City: Carver State: MA Zip Code: 02330



Alternative Contact Information

(e.g., system installation contractor or coordinating company, if appropriate):

Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone (Daytime): \_\_\_\_\_ (Evening): \_\_\_\_\_

Facsimile Number: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

Ownership (include % ownership by any electric utility): \_\_\_\_0% owned by electric utility

Site Control? (Y/N) \_Y\_\_

Will Facility be constructed on a single parcel of land? (Y/N) \_N\_\_

Authorized/Proposed generation capacity already exists (check all that apply):

- On Current Account
- On Same Legal Parcel of Land
- In Same Building/Structure

If any apply, include existing generation capacity on design diagrams, and provide

Application Number(s): \_\_\_\_\_

Confidentiality Statement: "I agree to allow information regarding the processing of my application (without my name and address) to be reviewed by the Massachusetts DG Working Group that is exploring ways to further expedite future interconnections." Yes \_X\_ No \_\_\_\_

Group Study Agreement: "I understand and agree if my project becomes part of a Group Study, the Company is authorized to share my contact information and project details with other parties that are also involved in the Group Study."

**Generating Facility Information**

*Please provide all Pre-Application Reports (either mandatory or optional) as attachments. This is mandatory for systems greater than or equal to 500 kW.*

Address of Facility: 20 N. Carver Road

City: Wareham State: MA Zip Code: 02576

Electric Distribution Company: \_\_\_\_\_

Account Number: \_\_\_\_\_

Meter Number: \_\_\_\_\_



System Design Capacity: Nominal 3000 (kW) 3000 (kVA)  
Maximum 3000 (kW) 3000 (kVA)

For Solar PV provide the DC-STC rating: 9000 (kW<sub>DC</sub>)

Type of Generating Unit: Synchronous \_\_\_\_\_ Induction \_\_\_\_\_ Inverter X

Manufacturer: \_\_\_\_\_ Model: \_\_\_\_\_

Prime Mover:  Fuel Cell  Reciprocating Engine  Gas Turbine  Steam Turbine  
 Microturbine  Photovoltaic Other \_\_\_\_\_ Energy storage \_\_\_\_\_

Energy Source:  Solar  Wind  Hydro  Diesel  Natural Gas  Fuel Oil  
Other \_\_\_\_\_ Energy storage \_\_\_\_\_ (Please Specify)

For Solar PV provide the DC-STC rating: 9000 (kW)

IEEE 1547.1 (UL 1741) Listed? Yes X No \_\_\_\_\_

1) Generating Unit Type 1

Manufacturer: POWER ELECTRONICS Model Name and Number: HEMK FS2000K

Quantity: 2

Single    or Three X Phase

AC Rating: Nominal: 2000 (kW) 2000 (kVA) 600 (AC Volts)

Maximum: 2000 (kW) 2000 (kVA) 600 (AC Volts)

2) Generating Unit Type 2 (if applicable)

Manufacturer: \_\_\_\_\_ Model Name and Number: \_\_\_\_\_

Quantity: \_\_\_\_\_

Single    or Three    Phase

AC Rating: Nominal: \_\_\_\_\_ (kW) \_\_\_\_\_ (kVA) \_\_\_\_\_ (AC Volts)

Maximum: \_\_\_\_\_ (kW) \_\_\_\_\_ (kVA) \_\_\_\_\_ (AC Volts)



3) Generating Unit Type 3 (if applicable)

Manufacturer: \_\_\_\_\_ Model Name and Number: \_\_\_\_\_

Quantity: \_\_\_\_\_

Single \_\_\_ or Three \_\_\_ Phase

AC Rating:            Nominal: \_\_\_\_\_ (kW) \_\_\_\_\_ (kVA) \_\_\_\_\_ (AC Volts)

                                 Maximum: \_\_\_\_\_ (kW) \_\_\_\_\_ (kVA) \_\_\_\_\_ (AC Volts)

Need an air quality permit from DEP? Yes \_\_\_ No X Not Sure \_\_\_

                                 If "yes", have you applied for it? Yes \_\_\_ No \_\_\_

Planning to Export Power? Yes X No \_\_\_            A Cogeneration Facility? Yes \_\_\_ No X

Anticipated Export Power Purchaser: Eversource Energy (NSTAR) \_\_\_

Export Form? Simultaneous Purchase/Sale X Net Purchase/Sale \_\_\_ Net Metering \_\_\_

Other (Specify)

\_\_\_\_\_

*If net metering, please refer to Schedule Z of the Standards for Interconnection of Distributed Generation. Please note that if under the public cap, all off-takers must be a Municipality or Other Governmental Entity (as defined in 220 C.M.R. 18.02) and therefore be certified by the DPU.*

Est. Install Date: 9/1/19 Est. In-Service Date: 10/31/19 Agreement Needed By: 12/31/18

\_\_\_\_\_

**Application Process**

I am opting to forego the Expedited Process. Please review this application under the Standard Process.    Yes X No \_\_\_\_\_

I hereby certify that, to the best of my knowledge, all of the information provided in this application is true:

Interconnecting Customer Signature  Title: Manager Date: 8/9/18\_\_\_\_\_

The information provided in this application is complete:  
Company Signature: \_\_\_\_\_ Title: \_\_\_\_\_ Date: \_\_\_\_\_  
\_\_\_\_\_



**Generating Facility Technical Detail**

Information on components of the generating facility that are currently Listed

	Equipment Type	Manufacturer	Model	National Standard
1.	INVERTER	POWER ELECTRONICS	HEMK FS2000K	UL1741SA
2.	MODULE	JINKO	JKM370M-72	IEC61215
3.	DC-DC CONVERTER	POWER ELECTRONICS	FREEMAQ	UL 1741 PENDING,IEEE1547
4.	BATTERY MODULE ESS	SAMSUNG		
5.				
6.				

Total Number of Generating Units in Facility?  
2

Generator Unit Power Factor Rating:  
1

Max Adjustable Leading Power Factor? 0.5      Max Adjustable Lagging Power Factor? 0.5

**Generator Characteristic Data (for all inverter-based machines)**

Max Design Fault Contribution Current? \_\_\_\_\_ Instantaneous \_\_\_\_\_ or RMS? \_\_\_\_\_ <sup>1-CYCLE RMS</sup>

Harmonics Characteristics: 3124.9Arms, 28.2ms total duration time  
<3%

Start-up power requirements:  
\_\_\_\_\_

**Generator Characteristic Data (for all rotating machines)**

Rotating Frequency: \_\_\_\_\_ (rpm)                      Neutral Grounding Resistor (If Applicable): \_\_\_\_\_

**Additional Information for Synchronous Generating Units**

Synchronous Reactance, Xd: \_\_\_\_\_ (PU)                      Transient Reactance, X'd: \_\_\_\_\_ (PU)  
Subtransient Reactance, X'd: \_\_\_\_\_ (PU)                      Neg Sequence Reactance, X2: \_\_\_\_\_ (PU)  
Zero Sequence Reactance, Xo: \_\_\_\_\_ (PU)                      kVA Base: \_\_\_\_\_  
Field Voltage: \_\_\_\_\_ (Volts)                      Field Current: \_\_\_\_\_  
(Amps)

**Additional information for Induction Generating Units**

Rotor Resistance, Rr: \_\_\_\_\_                      Stator Resistance, Rs: \_\_\_\_\_  
Rotor Reactance, Xr: \_\_\_\_\_                      Stator Reactance, Xs: \_\_\_\_\_  
Magnetizing Reactance, Xm: \_\_\_\_\_                      Short Circuit Reactance, Xd'': \_\_\_\_\_  
Exciting Current: \_\_\_\_\_                      Temperature Rise: \_\_\_\_\_  
Frame Size: \_\_\_\_\_  
Total Rotating Inertia, H: \_\_\_\_\_                      Per Unit on kVA Base: \_\_\_\_\_  
Reactive Power Required In Vars (No Load): \_\_\_\_\_                      POLYMER LITHIUM ION  
Reactive Power Required In Vars (Full Load): \_\_\_\_\_

**Additional information for Induction Generating Units that are started by motoring**

Motoring Power: \_\_\_\_\_ (kW)                      Design Letter: \_\_\_\_\_

**Interconnection Equipment Technical Detail**

Date: \_\_\_\_\_

Will a transformer be used between the generator and the point of interconnection?

Yes  No \_\_\_\_\_

Will the transformer be provided by Interconnecting Customer?    Yes  No \_\_\_\_\_

**Transformer Data (if applicable, for Interconnecting Customer-Owned Transformer):**

Nameplate Rating:    2000&1000 \_\_\_\_\_ (kVA)                      Single \_\_\_\_\_ or Three  Phase

Transformer Impedance:    5.75 \_\_\_\_\_ (%) on a                      2000&1000 kVA Base

If Three Phase:    22800

Transformer Primary: \_\_\_\_\_ (Volts) \_\_\_\_\_ Delta \_\_\_\_\_ Wye  WyeGrounded \_\_\_\_\_ Other

Transformer Secondary: \_\_\_\_\_ (Volts) \_\_\_\_\_ Delta  Wye \_\_\_\_\_ WyeGrounded \_\_\_\_\_ Other



**Transformer Fuse Data (if applicable, for Interconnecting Customer-Owned Fuse):**  
(Attach copy of fuse manufacturer’s Minimum Melt & Total Clearing Time-Current Curves)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Size: \_\_\_\_\_ Speed: \_\_\_\_\_

**Interconnecting Circuit Breaker (if applicable):**

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Load Rating: \_\_\_\_\_ (Amps)  
Interrupting Rating: \_\_\_\_\_ (Amps) Trip Speed: \_\_\_\_\_ (Cycles)

**Interconnection Protective Relays (if applicable):**  
(If microprocessor-controlled)

List of Functions and Adjustable Setpoints for the protective equipment or software:

	Setpoint Function	Minimum	Maximum
1.	SEE 1-LINE	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

(If discrete components)

(Enclose copy of any proposed Time-Overcurrent Coordination Curves)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting:  
\_\_\_\_\_

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting:  
\_\_\_\_\_

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting:  
\_\_\_\_\_

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting:  
\_\_\_\_\_

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting:  
\_\_\_\_\_



Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Style/Catalog No.: \_\_\_\_\_ Proposed Setting:  
\_\_\_\_\_

**Current Transformer Data (if applicable):**

(Enclose copy of Manufacturer's Excitation & Ratio Correction Curves)

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection:  
\_\_\_\_\_

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection:  
\_\_\_\_\_

**Potential Transformer Data (if applicable):**

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection:  
\_\_\_\_\_

Manufacturer: \_\_\_\_\_ Type: \_\_\_\_\_ Accuracy Class: \_\_\_\_\_ Proposed Ratio Connection:  
\_\_\_\_\_



**General Technical Detail**

Date: \_\_\_\_\_

Enclose 3 copies, or send 1 electronic copy, of site electrical One-Line Diagram showing the configuration of all generating facility equipment, current and potential circuits, and protection and control schemes with a Massachusetts registered professional engineer (PE) stamp. Enclose 3 copies, or send 1 electronic copy, of any applicable site documentation that indicates the precise physical location of the proposed generating facility (e.g., USGS topographic map or other diagram or documentation).

Proposed Location of Protective Interface Equipment on Property:  
(Include Address if Different from Application Address)

---

---

Enclose copy of any applicable site documentation that describes and details the operation of the protection and control schemes.

Enclose copies of applicable schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable).

When mailing application fee checks, please enclose a copy of this signed interconnection application form with the payment. Please enclose any other information pertinent to this Facility.



ATTACHMENT 2

Certificate of Completion for Expedited/Standard Process Interconnections

**Installation Information:**

Check if owner-installed

Interconnecting Customer Name (print): \_\_\_\_\_

Contact Person: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone (Daytime): \_\_\_\_\_ (Evening): \_\_\_\_\_

Facsimile Number: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

Address of Facility (if different from above):  
\_\_\_\_\_

Electrical Contractor's Name (if appropriate): \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Telephone (Daytime): \_\_\_\_\_ (Evening): \_\_\_\_\_

Facsimile Number: \_\_\_\_\_ E-Mail Address: \_\_\_\_\_

License number: \_\_\_\_\_

Date of approval to install Facility granted by the Company: \_\_\_\_\_

Application ID number: \_\_\_\_\_

**Inspection:**

The system has been installed and inspected in compliance with the local Building/Electrical Code of

\_\_\_\_\_  
(City/County)

Signed (Local Electrical Wiring Inspector, or attach signed electrical inspection):

\_\_\_\_\_  
Name (printed): \_\_\_\_\_

Date: \_\_\_\_\_

License # \_\_\_\_\_



As a condition of interconnection you are required to send/fax a copy of this form along with a copy of the signed electrical permit to (insert Company's name below):

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Mail 1: \_\_\_\_\_

Mail 2: \_\_\_\_\_

City, State ZIP: \_\_\_\_\_

Fax No.: \_\_\_\_\_



# BiHiKu

SUPER HIGH POWER BIFACIAL POLY PERC MODULE

390 W ~ 410 W

UP TO 30% MORE POWER FROM THE BACK SIDE

CS3W-390 | 395 | 400 | 405 | 410PB-AG



FRONT

BACK

### MORE POWER



Up to 30% more power from the back side



24 % more front side power than conventional modules



Low NMOT:  $41 \pm 3 \text{ }^\circ\text{C}$   
Low temperature coefficient (Pmax):  $-0.37 \text{ } \%/ \text{ }^\circ\text{C}$



Better shading tolerance

### MORE RELIABLE



Lower internal current, lower hot spot temperature



Minimizes micro-cracks and snail trails



Heavy snow load up to 5400 Pa, wind load up to 2400 Pa \*



Fire Class A and Type 3 / Type 13

\*For detail information, please refer to Installation Manual.



linear power output warranty\*



product warranty on materials and workmanship\*

\*According to the applicable Canadian Solar Limited Warranty Statement.

### MANAGEMENT SYSTEM CERTIFICATES\*

ISO 9001:2015 / Quality management system  
ISO 14001:2015 / Standards for environmental management system  
OHSAS 18001:2007 / International standards for occupational health & safety

### PRODUCT CERTIFICATES\*

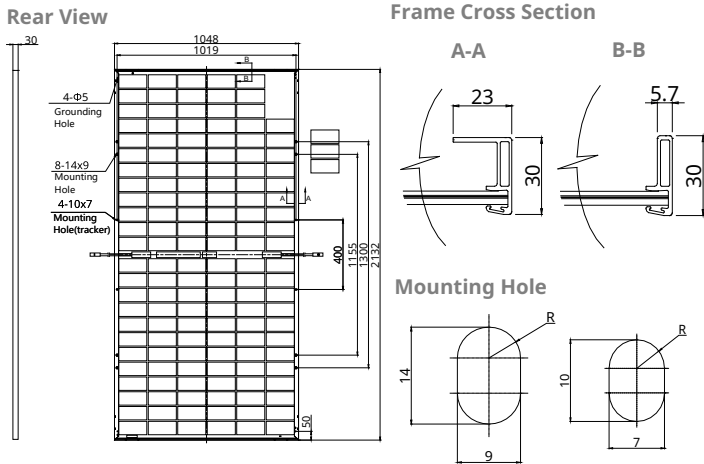
IEC 61215 / IEC 61730: VDE / CE / MCS / INMETRO  
UL 1703 / IEC 61215 performance: CEC listed (US)  
UL 1703: CSA / IEC 61701 ED2: VDE / IEC 62716: VDE  
Take-e-way



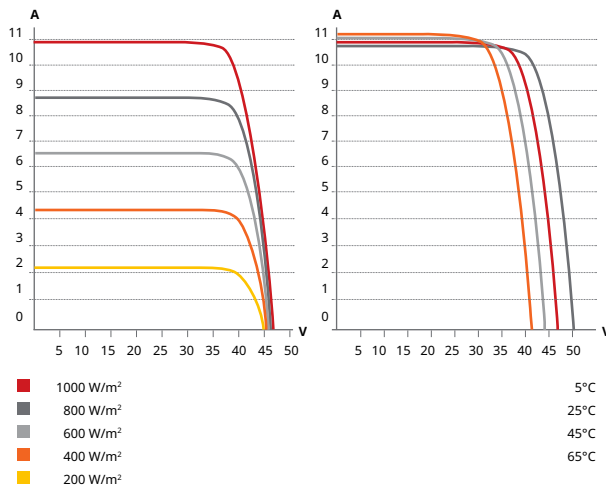
\* As there are different certification requirements in different markets, please contact your local Canadian Solar sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

**CANADIAN SOLAR (USA), INC.** is committed to providing high quality solar products, solar system solutions and services to customers around the world. No. 1 module supplier for quality and performance/price ratio in IHS Module Customer Insight Survey. As a leading PV project developer and manufacturer of solar modules with over 34 GW deployed around the world since 2001.

**ENGINEERING DRAWING (mm)**



**CS3W-400PB-AG / I-V CURVES**



**ELECTRICAL DATA | STC\***

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)	Module Efficiency
<b>CS3W-390PB-AG</b>	390 W	38.3 V	10.19 A	46.8 V	10.74 A	17.45%
5%	410 W	38.3 V	10.71 A	46.8 V	11.28 A	18.35%
<b>Bifacial Gain**</b>	10% 429 W	38.3 V	11.21 A	46.8 V	11.81 A	19.20%
20%	468 W	38.3 V	12.23 A	46.8 V	12.89 A	20.95%
30%	507 W	38.3 V	13.25 A	46.8 V	13.96 A	22.69%
<b>CS3W-395PB-AG</b>	395 W	38.5 V	10.26 A	47 V	10.82 A	17.68%
5%	415 W	38.5 V	10.78 A	47 V	11.36 A	18.57%
<b>Bifacial Gain**</b>	10% 435 W	38.5 V	11.3 A	47 V	11.9 A	19.47%
20%	474 W	38.5 V	12.31 A	47 V	12.98 A	21.21%
30%	513 W	38.5 V	13.34 A	47 V	14.07 A	22.96%
<b>CS3W-400PB-AG</b>	400 W	38.7 V	10.34 A	47.2 V	10.9 A	17.90%
5%	420 W	38.7 V	10.86 A	47.2 V	11.45 A	18.80%
<b>Bifacial Gain**</b>	10% 440 W	38.7 V	11.37 A	47.2 V	11.99 A	19.69%
20%	480 W	38.7 V	12.41 A	47.2 V	13.08 A	21.48%
30%	520 W	38.7 V	13.44 A	47.2 V	14.17 A	23.27%
<b>CS3W-405PB-AG</b>	405 W	38.9 V	10.42 A	47.4 V	10.98 A	18.13%
5%	425 W	38.9 V	10.94 A	47.4 V	11.53 A	19.02%
<b>Bifacial Gain**</b>	10% 445 W	38.9 V	11.46 A	47.4 V	12.08 A	19.92%
20%	486 W	38.9 V	12.5 A	47.4 V	13.18 A	21.75%
30%	527 W	38.9 V	13.56 A	47.4 V	14.27 A	23.59%
<b>CS3W-410PB-AG</b>	410 W	39.1 V	10.49 A	47.6 V	11.06 A	18.35%
5%	431 W	39.1 V	11.03 A	47.6 V	11.61 A	19.29%
<b>Bifacial Gain**</b>	10% 451 W	39.1 V	11.54 A	47.6 V	12.17 A	20.18%
20%	492 W	39.1 V	12.59 A	47.6 V	13.27 A	22.02%
30%	533 W	39.1 V	13.64 A	47.6 V	14.38 A	23.85%

\* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

\*\* Bifacial Gain: The additional gain from the back side compared to the power of the front side at the standard test condition. It depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

**ELECTRICAL DATA**

Operating Temperature	-40°C ~ +85°C
Max. System Voltage	1500 V (IEC/UL) or 1000 V (IEC/UL)
Module Fire Performance	TYPE 3 / Type 13 (UL 1703) or CLASS A (IEC61730)
Max. Series Fuse Rating	25 A
Application Classification	Class A
Power Tolerance	0 ~ + 5 W
Power Bifaciality*	70 %

\* Power Bifaciality =  $P_{max, rear} / P_{max, front}$ , both  $P_{max, rear}$  and  $P_{max, front}$  are tested under STC, Bifaciality Tolerance: ± 5 %

\* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustment to the information described herein at any time without further notice.

Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

**ELECTRICAL DATA | NMOT\***

	Nominal Max. Power (Pmax)	Opt. Operating Voltage (Vmp)	Opt. Operating Current (Imp)	Open Circuit Voltage (Voc)	Short Circuit Current (Isc)
<b>CS3W-390PB-AG</b>	291 W	35.7 V	8.15 A	44.0 V	8.66 A
<b>CS3W-395PB-AG</b>	295 W	35.9 V	8.21 A	44.2 V	8.72 A
<b>CS3W-400PB-AG</b>	299 W	36.1 V	8.27 A	44.4 V	8.79 A
<b>CS3W-405PB-AG</b>	302 W	36.3 V	8.33 A	44.6 V	8.85 A
<b>CS3W-410PB-AG</b>	306 W	36.5 V	8.39 A	44.8 V	8.92 A

\* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

**MECHANICAL DATA**

Specification	Data
Cell Type	Poly-crystalline
Cell Arrangement	144 [2X (12 X6)]
Dimensions	2132 × 1048 × 30 mm (83.9 × 41.3 × 1.2 in)
Weight	28.2 kg (62.2 lbs)
Front / Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 diodes
Cable	4.0 mm² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 400 mm (15.7 in) (+) / 280 mm (11.0 in) (-); landscape: 1400 mm (55.1 in); leap-frog connection: 1850 mm (72.8 in)*
Connector	T4 series
Per Pallet	35 pieces

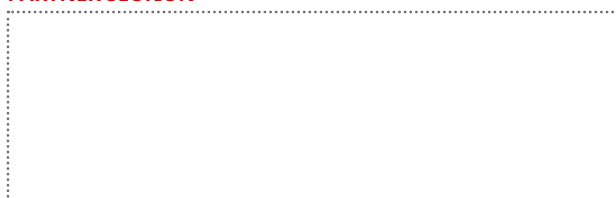
Per Container (40' HQ) 770 pieces or 560 pieces (only for US and Canada)

\* For detailed information, please contact your local Canadian Solar sales and technical representatives.

**TEMPERATURE CHARACTERISTICS**

Specification	Data
Temperature Coefficient (Pmax)	-0.37 % / °C
Temperature Coefficient (Voc)	-0.29 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

**PARTNER SECTION**



PROPOSED RELAY SETTINGS -1					
ANSI #	PICKUP			TIME DELAY (CLEARING TIME) / TIME DIAL	
	V/A p.u./Percentage	V/A Primary	V/A Secondary	Cycles	Seconds
27-1	0.50/50	6.58kV	0.75V	66	1.1
27-2	0.88/88	11.58kV	1.32V	120	2.0
59-1	1.10/110	14.48kV	1.65V	120	2.0
59-2	1.20/120	15.80kV	1.80V	9.6	0.16
81/U-1		58.5Hz		18000	300
81/U-2		56.5Hz		9.6	0.16
81/O-1		61.2Hz		18000	300
81/O-2		62.0Hz		9.6	0.16
50	TBD			INSTANTANEOUS	
51P	TBD			TBD	TBD
51G	TBD			TBD	TBD

1. TOTAL CLEARING TIME INCLUDES 3 CYCLE ESTIMATE CONTACTOR OPENING TIME (0.05 SEC).  
 2. THE RELAY WILL BE PROGRAMMED TO TRIP THE MAIN DISCONNECT WHEN THE BATTERY VOLTAGE IS OUT OF NORMAL OPERATING RANGE OR RELAY HARDWARE FAILURE.  
 3. AUTO-RESTORATION: RELAY PROGRAMMING LOGIC INCLUDED SUCH THAT THE SYSTEM WILL RESTORE THE INTERCONNECTION UPON THE STABILIZATION OF THE UTILITY VOLTAGE AND FREQUENCY. VOLTAGE AND FREQUENCY WILL BE SUPERVISED BY 27, 81, AND 59 ELEMENTS FOR A FIVE-MINUTE DURATION BEFORE CLOSE COMMAND IS INITIATED. AUTO-RESTORATION LOGIC WILL LOCK-OUT RELAY BASED ON OVERCURRENT TRIP OR MANUAL OPEN.

PROPOSED RELAY SETTINGS -2					
ANSI #	PICKUP			TIME DELAY (CLEARING TIME) / TIME DIAL	
	V/A p.u./Percentage	V/A Primary	V/A Secondary	Cycles	Seconds
27-1	0.50/50	6.58kV	0.75V	66	1.1
27-2	0.88/88	11.58kV	1.32V	120	2.0
59-1	1.10/110	14.48kV	1.65V	120	2.0
59-2	1.20/120	15.80kV	1.80V	9.6	0.16
81/U-1		58.5Hz		18000	300
81/U-2		56.5Hz		9.6	0.16
81/O-1		61.2Hz		18000	300
81/O-2		62.0Hz		9.6	0.16
50	TBD			INSTANTANEOUS	
51P	TBD			TBD	TBD
51G	TBD			TBD	TBD

1. TOTAL CLEARING TIME INCLUDES 3 CYCLE ESTIMATE CONTACTOR OPENING TIME (0.05 SEC).  
 2. THE RELAY WILL BE PROGRAMMED TO TRIP THE MAIN DISCONNECT WHEN THE BATTERY VOLTAGE IS OUT OF NORMAL OPERATING RANGE OR RELAY HARDWARE FAILURE.  
 3. AUTO-RESTORATION: RELAY PROGRAMMING LOGIC INCLUDED SUCH THAT THE SYSTEM WILL RESTORE THE INTERCONNECTION UPON THE STABILIZATION OF THE UTILITY VOLTAGE AND FREQUENCY. VOLTAGE AND FREQUENCY WILL BE SUPERVISED BY 27, 81, AND 59 ELEMENTS FOR A FIVE-MINUTE DURATION BEFORE CLOSE COMMAND IS INITIATED. AUTO-RESTORATION LOGIC WILL LOCK-OUT RELAY BASED ON OVERCURRENT TRIP OR MANUAL OPEN.

INVERTER SETTINGS		
ANSI #	PICKUP (%V / V <sub>LL</sub> Hz)	DELAY (CYCLES : SECONDS)
27	50% / 300V	66 : 1.1
27	88% / 528V	120 : 2.0
59	110% / 660V	120 : 2.0
59	120% / 720V	9.6 : 0.16
81/O-1	61.2Hz	18000 : 300
81/O-2	62.0Hz	9.6 : 0.16
81/U-1	58.5Hz	18000 : 300
81/U-2	56.5Hz	9.6 : 0.16

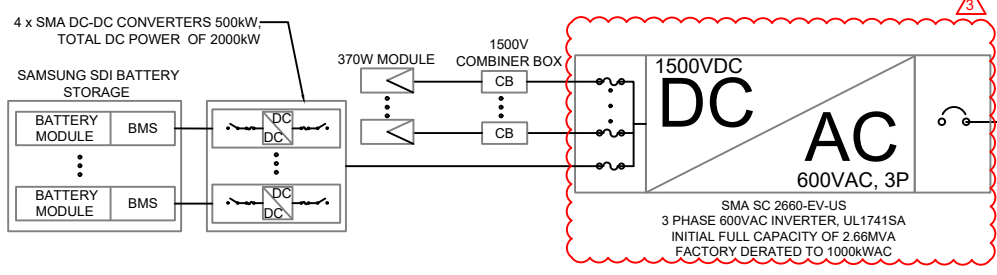
UTILITY	EVERSOURCE
CUSTOMER NAME	BE RE, LLC

PROPOSED POINT OF INTERCONNECTION TO 22.8kV 3-PHASE AT POLE # 9302 / 339 ON CIRCUIT # 3-81-81  
 LAT: 41.810632° -70.760471°

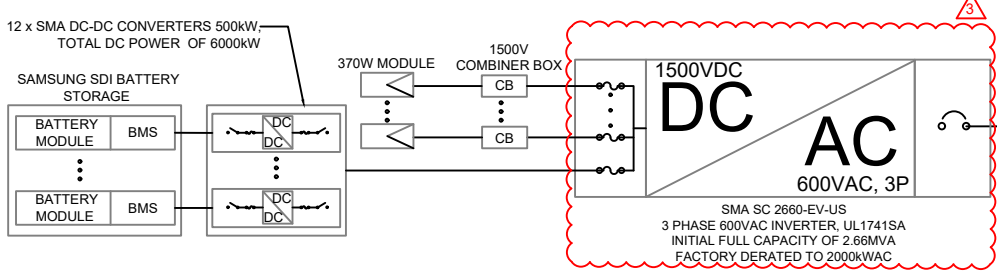
**RECLOSER NOTE:**

- TAVRIDA SAFE TRIP JUNCTION BOX PROVIDES FAILSAFE TRIP FUNCTION PER UTILITY REQUIREMENT AND IS SCADA ENABLED.
- WITH SAFE JUNCTION BOX, THE RECLOSER TRIPS WITHIN 2 SECONDS ON LOSS OF DC, LOSS OF AC AND ON RELAY MALFUNCTION ETC.

**BESS NOTE-1:**  
 1. THE MAXIMUM RATE OF CHANGE FOR THE BESS IS 7% OF THE FACILITY RATED AC CAPACITY (1,000kVA) PER SECOND, OR 70kVA/SEC.  
 2. THE ENERGY STORAGE SYSTEM (ESS) AND PV SYSTEM SHALL BE UL 9540 LISTED.



**BESS NOTE-2:**  
 1. THE MAXIMUM RATE OF CHANGE FOR THE BESS IS 7% OF THE FACILITY RATED AC CAPACITY (2,000kVA) PER SECOND, OR 140kVA/SEC.  
 2. THE ENERGY STORAGE SYSTEM (ESS) AND PV SYSTEM SHALL BE UL 9540 LISTED.



ESS System Specifications -1	
Battery Modules	SAMSUNG SDI LITHIUM-ION
Battery Energy Rating	36MWH
DC-DC Converters	SMA DC-DC CONVERTER (12 x 500kW)
DC Power Rating	6.0MW

ESS System Specifications -2	
Battery Modules	SAMSUNG SDI LITHIUM-ION
Battery Energy Rating	12MWH
DC-DC Converters	SMA DC-DC CONVERTER (4 x 500kW)
DC Power Rating	2.0MW

PV System Specifications -1	
PV Modules	16227 x JINKO JKM370M-72-DV 370W
DC Rating at STC	6.0MW
Inverters	1 x SMA SC 2660-EV-US, 600VAC, UL1741SA
TOTAL AC Rating	2.00MW (FACTORY DERATED)
DC/AC Ratio	3.0

PV System Specifications -2	
PV Modules	8100 x JINKO JKM370M-72-DV 370W
DC Rating at STC	3.0MW
Inverters	1 x SMA SC 2660-EV-US, 600VAC, UL1741SA
TOTAL AC Rating	1.00MW (FACTORY DERATED)
DC/AC Ratio	3.0

FOR UTILITY SUBMISSION  
 NOT FOR CONSTRUCTION

THIS DRAWING IS THE PROPERTY OF NEO VIRTUS ENGINEERING INC. PRODUCED EXCLUSIVELY FOR NEXTSUN ENERGY AND MUST NOT BE USED, COPIED, OR REPRODUCED WITHOUT THEIR EXPRESSED CONSENT. © COPYRIGHT NEO VIRTUS ENGINEERING, INC., 2020.

REVISIONS				
REV	DESCRIPTION	DATE	DESIGN	REVIEWED
-	-	-	-	-
3	INVERTER UPDATE	03-13-2020	LC	JB
2	ISSUED FOR UTILITY SUBMISSION	08-09-2018	KR	JB
1	ISSUED FOR REVIEW	08-09-2018	KR	JB
0	ISSUED FOR REVIEW	08-07-2018	KR	JB

LITTLETON, MASSACHUSETTS

JAMES M. BING

3/13/2020

ROCKY MAPLE  
 20 NORTH CARVER RD  
 WAREHAM MA 02576

DWG NAME		AC 1-LINE	
SIZE	D	SCALE:	AS-NOTED
DATE		08-07-2018	

DWG NO.  
**E-1.0**  
 NOT FOR CONSTRUCTION

**Commonwealth of Massachusetts**  
**Executive Office of Energy and Environmental Affairs**  
**DEPARTMENT OF ENERGY RESOURCES**  
**DEPARTMENT OF AGRICULTURAL RESOURCES**

**SOLAR MASSACHUSETTS RENEWABLE TARGET PROGRAM**  
**(225 CMR 20.00)**

**GUIDELINE**

**Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units**

**Effective Date: April 26, 2018**

**PURPOSE**

This document provides guidance regarding the manner in which a solar photovoltaic facility may qualify as an Agricultural Solar Tariff Generation Unit (“ASTGU”) under the Department of Energy Resource’s (Department) Solar Massachusetts Renewable Target (SMART) Program.

**BACKGROUND**

On April 11, 2016, Governor Baker signed Chapter 75 of the Acts of 2016 into law. The Act directs the Department to create a long-term sustainable solar incentive program to promote cost-effective solar in the Commonwealth. The Act further directed the Department to “...differentiate incentive levels to support diverse installation types and sizes that provide unique benefits...” In developing the SMART Program, the Department established six types of location based Compensation Rate Adders, one of which is provided for ASTGUs.

Given the small number of solar facilities that meet the objectives and criteria outlined in the definition of ASTGU in the Commonwealth today, but the desire to see the installation of such systems that can provide the dual-use benefits, the Department, in consultation with the Massachusetts Department of Agricultural Resources (MDAR), has developed this Guideline to clarify additional eligibility criteria not prescribed in regulation.

Adopting these provisions via Guideline, as was requested by many commenters in the initial stakeholder process that led to the promulgation of the regulation, will provide the necessary flexibility for the Department, in consultation with MDAR, to make modifications to key eligibility criteria as lessons are learned in constructing and operating ASTGUs.

Any modifications to this Guideline will only be made following an opportunity for public comment that shall remain open for at least two weeks. All capitalized terms in this Guideline are defined in 225 CMR 20.02.

**225 CMR 20.00 Regulatory Provisions Specific to ASTGUs**

Under the SMART program, Solar Tariff Generation Units are eligible to qualify as an ASTGU, which is defined under 225 CMR 20.02 as follows:



Agricultural Solar Tariff Generation Unit. A Solar Tariff Generation Unit located on Land in Agricultural Use or Prime Agricultural Farmland that allows the continued use of the land for agriculture.

Additionally, 225 CMR 20.06(1)(d) contains special provisions pertaining specifically to the eligibility of ASTGUs:

(d) Special Provisions for Agricultural Solar Tariff Generation Units. In order to qualify as an Agricultural Solar Tariff Generation Unit, a Solar Tariff Generation Unit must submit documentation itemized in 225 CMR 20.06(1)(d) below. All final determinations regarding the eligibility of such facilities will be made by the Department, in consultation with MDAR. A Solar Tariff Generation Unit must also submit satisfactory documentation to the Department as detailed in the Department's *Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units*.

1. the Solar Tariff Generation Unit will not interfere with the continued use of the land beneath the canopy for agricultural purposes;
2. the Solar Tariff Generation Unit is designed to optimize a balance between the generation of electricity and the agricultural productive capacity of the soils beneath;
3. the Solar Tariff Generation Unit is a raised structure allowing for continuous growth of crops underneath the solar photovoltaic modules, with height enough for labor and/or machinery as it relates to tilling, cultivating, soil amendments, harvesting, *etc.* and grazing animals;
4. crop(s) to be grown to be provided by the farmer or farm agronomist in conjunction with UMass Amherst agricultural extension services, including compatibility with the design of the agricultural solar system for such factors as crop selection, sunlight percentage, *etc.*;
5. annual reporting to the Department and MDAR of the productivity of the crop(s) and herd, including pounds harvested and/or grazed, herd size growth, success of the crop, potential changes, *etc.*, shall be provided after project implementation and throughout the SMART incentive period; and
6. other system design information, which shall include, but not be limited to:
  - a. dual-use type, *e.g.*, ground mount racking, pole towers, tracking, *etc.*;
  - b. total gross acres of open farmland to be integrated with the project;
  - c. type of crop(s) to be grown, including grazing crops;
  - d. pounds of crop(s) projected to be grown and harvested, or grazed;
  - e. animals to be grazed with herd size(s); and
  - f. design drawing including mounting system type (fixed, tracking), panel tilt, panel row spacing, individual panel spacing, for pole towers tower spacing and mounting height, *etc.*

#### **Additional Provisions for ASTGUs**

Provided a Solar Tariff Generation Unit meets all program eligibility criteria in 225 CMR 20.00, in particular the provisions relating to ASTGUs prescribed in 225 CMR 20.02 and 20.06(1)(d), a Solar Tariff Generation Units must also satisfy the following provisions to qualify as an ASTGU. Note that these provisions take into account the entire useful life of the solar photovoltaic array with consideration for the variety of possible agricultural activities and crops that could take place on farm land over that timeframe. In other words, they do not simply consider present use.

The parameters defined in Section A below will allow for the variety and flexibility of potential farming operations at any given farm throughout the life of the solar photovoltaic array. These parameters are stated as minimums, giving farms the flexibility to determine and finalize farming operations. Applicants complying with the additional provisions in Section A below will be reviewed in an expedited process.

DOER intends to develop a standard design tool (SMART Tool) to be mandated for use by all Agricultural Solar Generation Tariff Unit applicants, and to be used by developers and farmers alike to demonstrate meeting the SMART regulations and Guidelines. The SMART Tool will be designed to:

- a) assist in the design of an Agricultural Solar Generation Tariff Unit by understanding the shading impact on all the land beneath, behind, and throughout the farmed area, of various dual-use array system designs and layouts;
- b) provide a farm plan template to be used by the landowner to propose their active agricultural production plan consistent with the array configuration and shading profile and compliant with the Guideline requirements; and
- c) provide an annual reporting form template compliant with the Guideline requirements.

#### **A. System Design Parameters:**

##### **1. Panel Height Requirements**

- a. For fixed tilt ASTGUs, the minimum height of the lowest panel point shall be eight (8) feet above ground;
- b. For tracking ASTGUs, the minimum height of the panel at its horizontal position shall be 10 feet above ground;

##### **2. Maximum Direct Sunlight Reduction Requirements**

All ASTGUs must demonstrate that the maximum sunlight reduction from the panel shading on every square foot of land directly beneath, behind and in the areas adjacent to and within the ASTGU's design shall not be more than 50% of baseline field conditions;

##### **3. Growing Season/Time of Day Considerations**

The typical growing season shall be considered to be March through October, with sunlight hour conditions with maximum 50% sunlight reduction to be between 10AM and 5PM for March and October, and from 9AM to 6PM from April through September;

##### **4. Maximum Size**

The maximum AC rated capacity of an ASTGU shall be two MW in the first two Capacity Blocks of each Distribution Company's service territory. The Department, in consultation with MDAR, will make an evaluation as to whether or not this provision shall be adjusted in subsequent Capacity Blocks.

#### **B. Waiver from Additional Provisions**

DOER recognizes the variety and, in some cases, the uniqueness of farming operations where some of the Additional Provisions for an ASTGU may not be required to achieve the objectives of the ASTGU. To address this issue, a landowner may request that DOER issue a waiver from any of the Additional Provisions for an ASTGU that is not contrary to the law or the intent of the regulations. All waiver requests should be submitted to [DOER.SMART@state.ma.us](mailto:DOER.SMART@state.ma.us).

In order to request a waiver, the applicant must provide the Department with the following:

1. Plan Development

Develop a plan that:

- a. describes how the applicant will integrate the ASTGU into their farming operation;
- b. demonstrates that a waiver does not result in a diminishment in the agricultural production capacity of the land; and
- c. demonstrates that the primary use of the land is for agricultural or horticultural production, as defined under M.G.L. Chapter 61A.

2. Justification and Substantiation

An applicant must provide justification as to why an ASTGU design is necessary for the proposed agricultural operations on the relevant parcel of land.

3. Additional Documentation

An applicant must provide documentation for each specific aspect of the design parameters from Section A of this Guideline for which the ASTGU requires a waiver as follows:

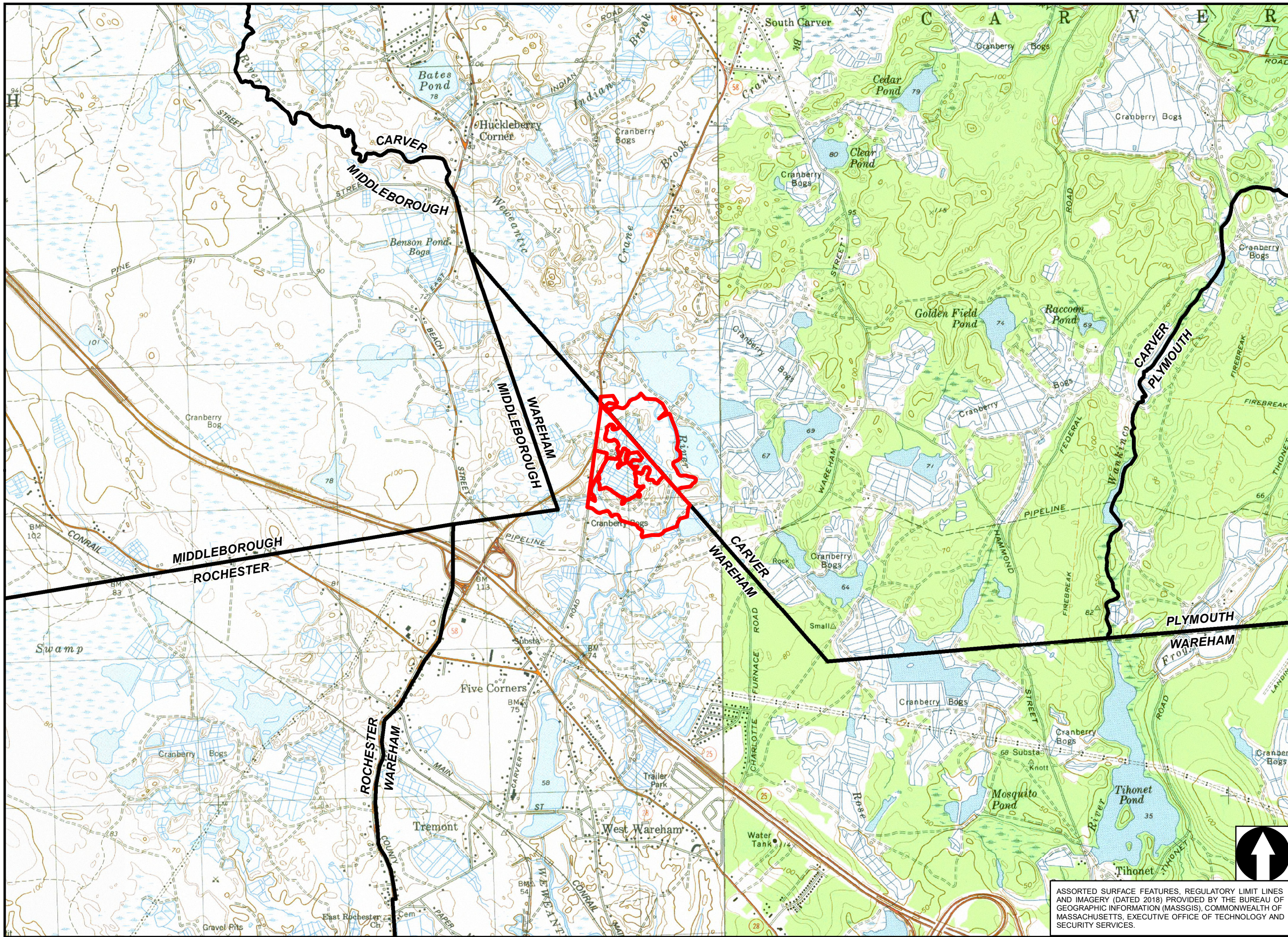
- a. Panel Height Requirements: Provide documentation demonstrating how the proposed design will allow for the variety and flexibility of a variety of potential farming operations at the farm throughout the term of the SMART Tariff.
- b. Maximum Direct Sunlight Reduction Requirements:
  - i. Demonstrate how the proposed dual use design will provide equal or greater total agricultural yields than if both the agricultural crop and the solar array were grown and installed separately, utilizing the same amount of total land area for the comparison;
  - ii. Demonstrate how each square foot of land will be used for agriculture production;
  - iii. Demonstrate how the design will be able to accommodate a variety of potential agricultural products throughout the twenty year term of the SMART Tariff.
- c. Growing Season/Time of Day Considerations: Provide documentation on how the time of season and day data in Section A is not relevant to the farming practice and operation, currently, and for the term of the SMART Tariff.
- d. Other: For all other requirements for which a waiver is being sought, please describe the waiver(s) requested, why the proposed alternatives require a waiver, and how these alternatives will meet the intention of the ASTGU regulations.

**Section 7.0**  
**Plans**

---

Locus Map  
Aerial Map  
Land Use

Entitled: Rocky Maple Solar  
Prepared by Beals and Thomas, Inc.  
In 22 Sheets  
Dated December 16, 2020



**Legend**

- Subject Property
- Town Line

PREPARED FOR:

**BE RE, LLC.**  
 PO BOX 974  
 EDWARDS, COLORADO

PREPARED BY:

**BEALS + THOMAS**  
 Civil Engineers + Landscape Architects +  
 Land Surveyors + Planners +  
 Environmental Specialists

BEALS AND THOMAS, INC.  
 32 Court Street  
 Plymouth, Massachusetts 02360  
 T 508.366.0560 | www.bealsandthomas.com

COPYRIGHT (C) BY BEALS AND THOMAS, INC.  
 ALL RIGHTS RESERVED

PROJECT:

**ROCKY MAPLE SOLAR**  
 WAREHAM & CARVER, MASSACHUSETTS

SCALE: 1" = 2,000'    DATE: JUNE 4, 2020


**USGS MAP**


B+T JOB NO. 3203.00    **FIGURE**  
 B+T PLAN NO. 3203P002A-001    **1**

ASSORTED SURFACE FEATURES, REGULATORY LIMIT LINES AND IMAGERY (DATED 2018) PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES.



**Legend**

 Subject Property

 Town Line

PREPARED FOR:

**BE RE, LLC.**  
 PO BOX 974  
 EDWARDS, COLORADO

PREPARED BY:

 **BEALS + THOMAS**  
 Civil Engineers + Landscape Architects +  
 Land Surveyors + Planners +  
 Environmental Specialists

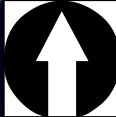
BEALS AND THOMAS, INC.  
 32 Court Street  
 Plymouth, Massachusetts 02360  
 T 508.366.0560 | www.bealsandthomas.com

COPYRIGHT (C) BY BEALS AND THOMAS, INC.  
 ALL RIGHTS RESERVED

PROJECT:

**ROCKY MAPLE SOLAR**  
 WAREHAM & CARVER, MASSACHUSETTS

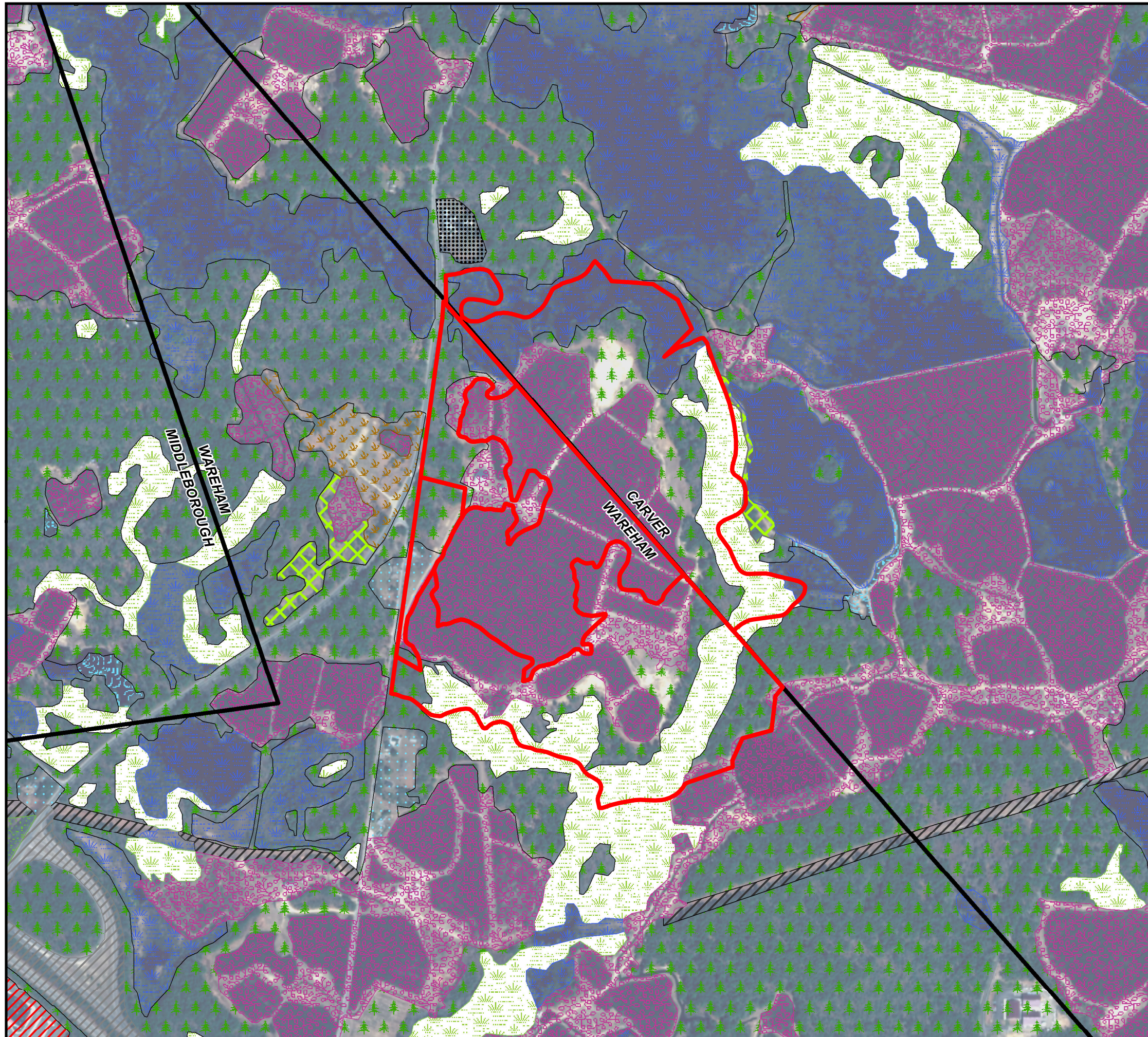
SCALE: 1" = 600'    DATE: JUNE 4, 2020



**AERIAL PHOTO**

ASSORTED SURFACE FEATURES, REGULATORY LIMIT LINES AND IMAGERY (DATED 2015) PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES.

B+T JOB NO. 3203.00	<b>FIGURE</b> <b>2</b>
B+T PLAN NO. 3203P002A-002	



**Legend**

Subject Property	Spectator Recreation
Town Line	Water-Based Recreation
Forest	Marina
Brushland/Successional	Multi-Family Residential
Open Land	High Density Residential
Water	Medium Density Residential
Forested Wetland	Low Density Residential
Non-Forested Wetland	Very Low Density Residential
Salt Water Wetland	Transitional
Saltwater Sandy Beach	Urban Public/Institutional
Cranberry Bog	Commercial
Orchard	Industrial
Nursery	Transportation
Cropland	Powerline/Utility
Pasture	Mining
Cemetery	Waste Disposal
Golf Course	Junkyard
Participation Recreation	

PREPARED FOR:  
**BE RE, LLC.**  
 PO BOX 974  
 EDWARDS, COLORADO

PREPARED BY:  
**BEALS + THOMAS**  
 Civil Engineers + Landscape Architects +  
 Land Surveyors + Planners +  
 Environmental Specialists

BEALS AND THOMAS, INC.  
 32 Court Street  
 Plymouth, Massachusetts 02360  
 T 508.366.0560 | www.bealsandthomas.com

COPYRIGHT (C) BY BEALS AND THOMAS, INC.  
 ALL RIGHTS RESERVED

PROJECT:  
**ROCKY MAPLE SOLAR**  
 WAREHAM & CARVER, MASSACHUSETTS

SCALE: 1" = 600'    DATE: JUNE 4, 2020



**LAND USE**

ASSORTED SURFACE FEATURES, REGULATORY LIMIT LINES AND IMAGERY (DATED 2015) PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES.

B+T JOB NO. 3203.00	<b>FIGURE</b> <b>6</b>
B+T PLAN NO. 3203P002A-006	