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TOWN CLERK'S OFFICE
PLYMOUTH, MA

2017 April Annual Town Meeting 2017 JAN 24 AM 8: 23 Article 30

REPORT AND RECOMMENDATION OF THE PLANNING BOARD ON THE PETITION OF SHARL HELLER, ET AL ON THE PROPOSED AMENDMENT TO SECTION 505-77 GROUND-MOUNTED SOLAR PHOTOVOLTAIC SYSTEMS

DATE OF PUBLICATION OF PUBLIC HEARING: November 30, 2016
December 7, 2016

DATE OF PUBLIC HEARING: December 19, 2016
January 9, 2017

VOTE: On January 9, 2017 the Planning Board voted (3-2) to recommend Town Meeting take the following actions on the proposed amendments to Section 205-77 Ground Mounted Solar Photovoltaic Systems of the Zoning Bylaw:

Underlined to be added and ~~strikethrough~~ to be deleted:

205-77(B)(2)(b.) GMSPS are prohibited on any parcel that includes Estimated Habitat of Wildlife or Priority Habitat or Rare Species as identified by the Commonwealth of Massachusetts Natural Heritage Program and Endangered Species Program or that are located within a State designated Area of Critical Environmental Concern (ACEC).

C(2)(g.) Buffers as defined in §205-3 are required as follows:

i. A minimum of ~~75~~ 150 feet for 1 to 2 MW DC systems;
ii. A minimum of ~~150~~ 200 feet for systems greater than 2 MW DC.

C(5)(a.) Notification - When site plan review is required, at least fourteen days prior to site plan review by the Planning Board, notice of the time and place of said review shall be sent by mail by the GMSPS Owner/Operator, postage prepaid to abutting owners of land within three hundred feet of the property line of the parcel or parcels upon which the GMSPS proposes to be situated, as said abutters appear on the most recent applicable tax list. The assessors maintaining any applicable tax list shall certify the names and addresses of parties in interest and such certification shall be conclusive for all purposes.

The Planning Board does not support the maximum size reduction in B(2)(a.) from fifteen acres to five acres.

NEED & JUSTIFICATION:

During the Fall 2016, Town Meeting process, a number of individuals encouraged the Town to continue to explore options to further regulate ground mounted solar photovoltaic system in Plymouth. This petitioned article seeks to impose two new limitations and modify three existing provisions.

All five Planning Board members are in is support of:

- Restricting GMSPS in sensitive environmental areas,
- Notifying abutters of site plan review, and
- Increasing the two existing buffer requirements.

However, a majority of the Board does not support reducing the maximum size of GMSPS to only 5 acres. A limitation of 5 acres is viewed as too restrictive.

EFFECT:

This article includes 5 modifications to the current bylaw:

1. Reduces the maximum size of a ground mounted solar photovoltaic system to 5 acres (opposed by the Planning Board);
2. Prohibits ground mounted solar photovoltaic system in Areas of Critical Environmental Concern and in areas identified by the Commonwealth as habitat for rare or endangered species;
3. Buffers are increased for 1 to 2 megawatt system from 75 feet to 150 feet
4. Buffers are increased for 2 megawatt or greater system from 150 feet to 200 feet; and
5. Requires abutter notification of Planning Board site plan review.

INTENT:

The Intent of this amendment to further refine the Bylaw approved at the Fall 2016 Annual Town Meeting and to impose reasonable regulations on ground mounted solar photovoltaic system to further protect Plymouth's residents and its unique natural environment.

TOWN OF PLYMOUTH BY:

Timothy Grandy, Chairman

Ken Buechs

Paul McAlduff

Malcolm MacGregor

Robert Bielen

BEING A MAJORITY OF THE PLANNING BOARD

DATE SIGNED BY THE PLANNING BOARD: January 23, 2017

DATE FILED WITH TOWN CLERK: January 24, 2017

cc: Town Clerk
Board of Selectmen
Advisory and Finance Committee

PROPOSED AMENDMENT:

205-77. Ground-Mounted Solar Photovoltaic Systems

A. **Intent.** The intent of this bylaw is to promote, by-right, subject to Site Plan Review, in all Districts, the generation of solar energy and to minimize the impacts of solar facilities on the character of neighborhoods, on property values, on the scenic, historic and environmental resources of the Town; and to protect health and safety, while allowing solar energy technologies to be utilized.

B. **Location and Area Requirements.**

Except as otherwise provided herein, GMSPS are allowed by right in all zoning districts subject to Site Plan Review under Section 205-32.

1. Site Plan Review is not required for a GMSPS that:

   a. Actively occupies 1,500 square feet or less of land and has a total GMSPS height of less than 8 feet from final grade, subject to Section C.2.e.; or

   b. is located on agricultural land, and used primarily for the accessory generation of energy for the operation of the agricultural use; or

   c. is located on a Development Site consisting primarily of Disturbed Area and, if located within any of the following Districts, provided a minimum 200-foot Buffer is in place along each Lot line that abuts a Residential District:

      I. Airport (AP)
      II. Arterial Commercial (AC)
      III. General Commercial (GC)
      IV. Highway Commercial (HC)
      V. Light Industrial (LI)
      VI. Light Industrial/Waterfront (LI/WF)
      VII. Mixed Commerce (MC)
      VIII. Parking Lots
      IX. Power Line Utility Easements

2. Prohibited.

   a. A GMSPS that actively occupies more than ~~fifteen~~ <u>five</u> acres in area in any Residential District.

   b. <u>GMSPS are prohibited on any parcel that include Estimated Habitats of Rare Wildlife or Priority Habitats of Rare Species as identified by the Commonwealth of Massachusetts Natural Heritage and Endangered Species Program or that are located within a State designated Area of Critical Environmental Concern (ACEC).</u>

   c. GMSPS are not allowed on parcels in R20-SL, R20-MD, R20-MF, R25, R40 and RR zones that have been previously disturbed (i.e.

cleared or substantially cleared of natural vegetation by other than natural forces such as fire or flood) for a period of five years from the date of disturbance.

C. **Standards.** The following standards apply to all GMSPS:

1. **Setback** – A GMSPS site and construction thereon shall conform to the dimensional and intensity requirements set forth in Table 5 of the Zoning Bylaw.

2. **Design** –

   a. **Lighting** – High efficiency lighting, such as LED, or equivalent, shall be limited to that required for safety and operational purposes, and shall comply with the requirements of §205-65 Prevention of Light Pollution.

   b. **Utility Connections** – Cabling and utility connections within the GMSPS shall be placed underground.

   c. **Security** – The GMSPS must be physically secured by measures including, but not limited to, appropriate fence material, construction, locking devices and surveillance equipment.

   d. **Signage** –

      i. Required: A sign complying with Sign bylaw §205-19 shall identify the owner and operator, if not the same, and provide the following information: business name for any company or other entity owning and/or operating the installation, with the business address and name of a contact person for each; electric utility or other safety warnings and a 24-hour emergency contact phone number.

      ii. Prohibited: Any advertising display.

   e. All emergency vehicle access ways shall conform to dimensional requirements of the Plymouth Fire Department.

   f. Screening, as defined in §205-3, shall be installed to shield residences from a GMSPS.

   g. Buffers as defined in §205-3 are required as follows:

      i. A minimum of ~~75~~ 150 feet for 1 to 2 MW DC systems;

      ii. A minimum of ~~150~~ 200 feet for systems greater than 2 MW DC.

3. **Land Clearing, Soil Erosion and Habitat Impacts.**

   a. Clearing of native vegetation on any undeveloped or land in its natural state shall be limited to that necessary for the construction, operation and maintenance of the GMSPS. Effective internal storm water management and erosion control features shall be maintained at all times during and post-construction.

Installed fencing shall maintain a minimum distance of 8 inches from final grade for small wildlife passage.

b. Stormwater management controls shall comply with Plymouth's Stormwater Design Guidelines. Percolation tests will be required if no stormwater system controls are provided.

c. Management of all vegetated areas within the GMSPS shall be maintained throughout the life of the project through mechanical means and without the use of chemical herbicides.

4. **Information Required with Zoning Permit for all GMSPS.**

a. **Landscape Plan** – A landscape plan prepared by a Registered Landscape Architect is required and shall include location of existing significant trees, shrubs and grasses to remain and all proposed additions, identified by specimen size and species at installation. Low growth vegetation shall be planted and maintained in areas under GMSPS rack equipment.

b. **Materials** – Manufacturer's specifications for a proposed GMSPS shall be provided for all equipment and attendant facilities and include documentation of the major system components to be used, including panels, mounting system, rated name plate capacity, colors, inverter and interconnection details.

c. **Safety** – The GMSPS Owner or Operator shall submit a copy of the project summary, electrical schematic, and Development Site plan to the Building Commissioner, with a copy for review by the Fire Chief. Instructions to de-energize the system shall be made available to public safety personnel. The owner or operator shall identify a responsible person for public inquiries throughout the life of the GMSPS.

d. Financial Surety – Except for a municipally owned GMSPS, a project designed to generate in excess of 2MW shall require a performance guarantee in the form of a cash bond in an amount approved by the Building Commissioner to cover the cost of GMSPS removal in the event the town must remove the installation and stabilize the Development Site with loam and seed.

5. **Other Requirements.**

a. **Notification** – When site plan review is required, at least fourteen days prior to site plan review by the Planning Board, notice of the time and place of said review shall be sent by mail by the GMSPS Owner/Operator, postage prepaid to abutting owners of land within three hundred feet of the property line of the parcel or parcels upon which the GMPS proposes to be situated, as said abutters appear on the most recent applicable tax list. The assessors maintaining any applicable tax list shall certify the names and addresses of parties in interest and such certification shall be conclusive for all purposes.

At least 60 business days prior to the commencement of work on a project, the GMSPS Owner/Operator shall notify abutters within 300 feet of when work will commence and that site plans are available for public review at Town Hall.

b. **Modification** – A substantial modification to a GMSPS shown on an approved Site Plan shall require Site Plan modification in compliance with the standards and procedures applicable to the original application.

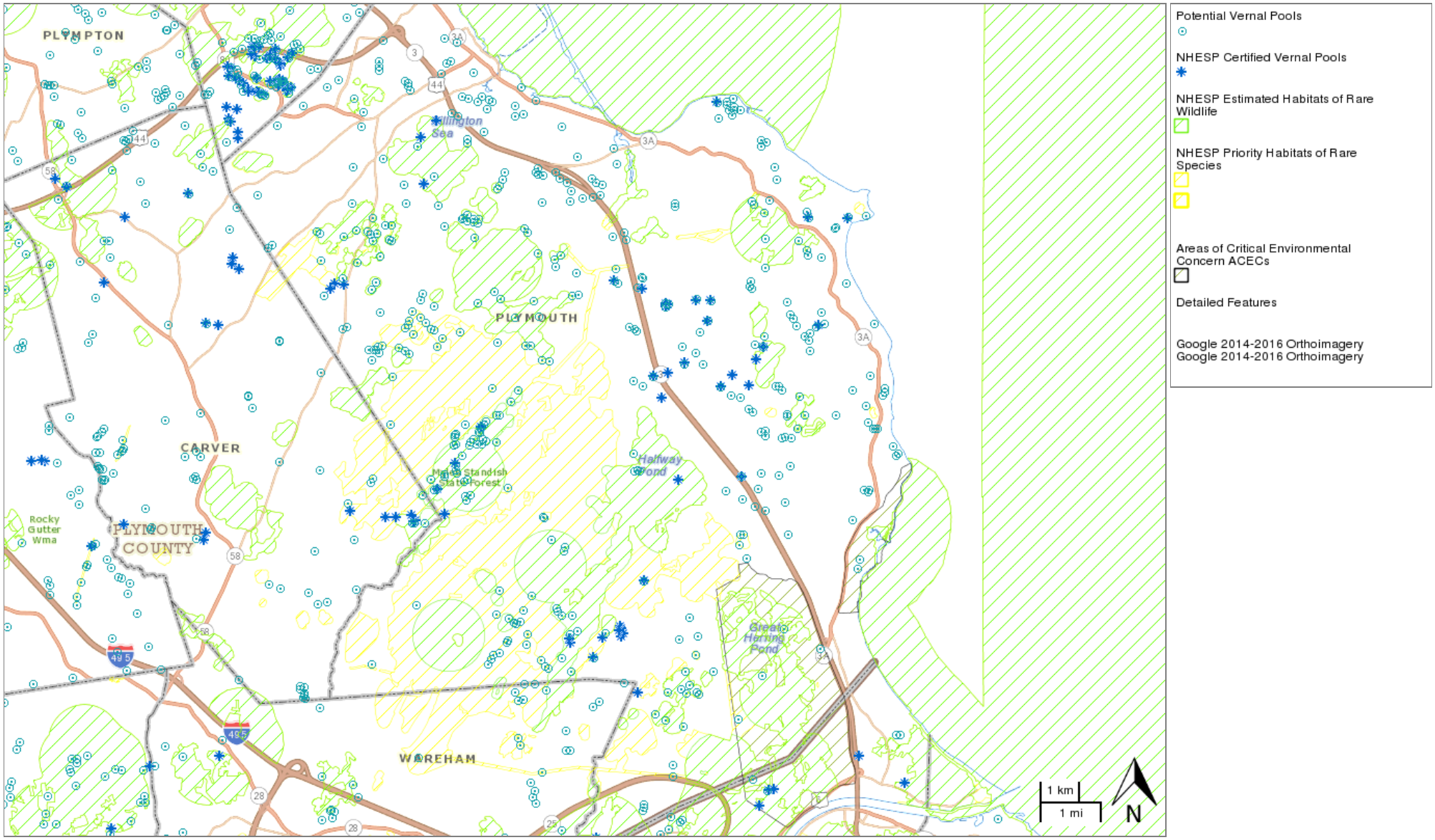
c. **Segmentation** – Adjacent parcels in the same ownership or control shall be deemed to be one parcel for purpose of calculating the area limitation of §B.2 above.

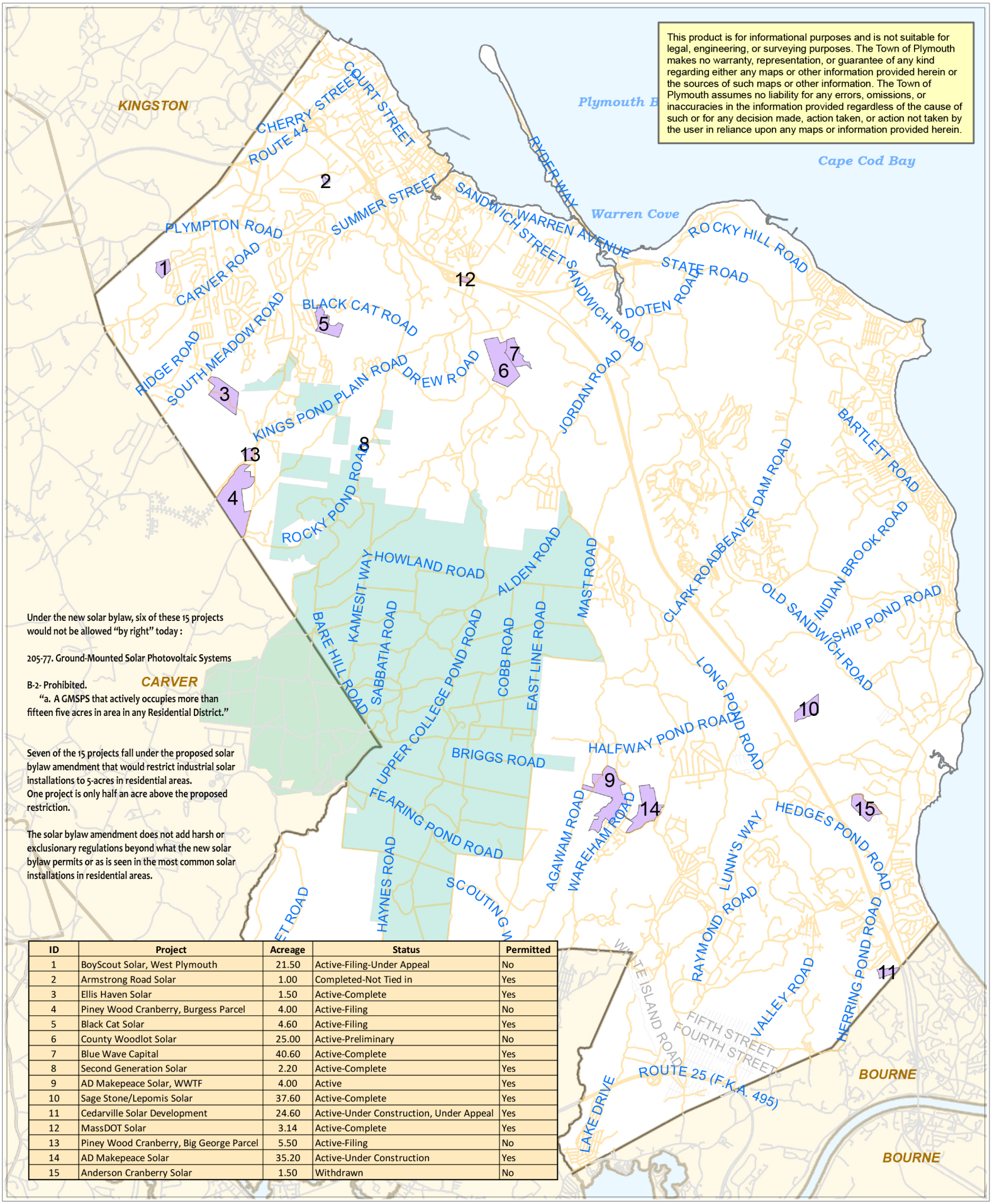
d. **Abandonment** – A GMSPS shall be deemed abandoned when its operations are discontinued for more than one year without the written consent of the Building Commissioner; or if the Building Commissioner has determined that the installation is a hazard to public safety and the conditions have not been corrected within three months. A GMSPS must be removed by its owner and the site restored when it has been abandoned as provided herein.

e. **Site Restoration** – A GMSPS must be removed by its owner within 150 days from the date of discontinuation of operations. The owner or operator shall notify the Building Commissioner by certified mail of the proposed date of discontinuation and provide detailed plans and schedule for GMSPS removal and restoration of the site to a function approved by the Building Commissioner or to a natural vegetative state.

f. **Exemption** – This Section 205-77 shall not apply to a GMSPS for which a zoning permit was issued and was still in effect as of July 20, 2016 [the first publication date of notice of the August 8, 2016 Planning Board public hearing], but the record owner of the land shall have the right to waive this exemption, in which case this Section 205-77 shall apply.

Plymouth NHESP Estimated Habitats of Rare Wildlife/Priority Habitats of Rare Species





Under the new solar bylaw, six of these 15 projects would not be allowed "by right" today :

205-77. Ground-Mounted Solar Photovoltaic Systems

B-2- Prohibited.

"a. A GMSPS that actively occupies more than fifteen five acres in area in any Residential District."

CARVER

Seven of the 15 projects fall under the proposed solar bylaw amendment that would restrict industrial solar installations to 5-acres in residential areas.
One project is only half an acre above the proposed restriction.

The solar bylaw amendment does not add harsh or exclusionary regulations beyond what the new solar bylaw permits or as is seen in the most common solar installations in residential areas.

ID	Project	Acreage	Status	Permitted
1	BoyScout Solar, West Plymouth	21.50	Active-Filing-Under Appeal	No
2	Armstrong Road Solar	1.00	Completed-Not Tied in	Yes
3	Ellis Haven Solar	1.50	Active-Complete	Yes
4	Piney Wood Cranberry, Burgess Parcel	4.00	Active-Filing	No
5	Black Cat Solar	4.60	Active-Filing	Yes
6	County Woodlot Solar	25.00	Active-Preliminary	No
7	Blue Wave Capital	40.60	Active-Complete	Yes
8	Second Generation Solar	2.20	Active-Complete	Yes
9	AD Makepeace Solar, WWTF	4.00	Active	Yes
10	Sage Stone/Lepomis Solar	37.60	Active-Complete	Yes
11	Cedarville Solar Development	24.60	Active-Under Construction, Under Appeal	Yes
12	MassDOT Solar	3.14	Active-Complete	Yes
13	Piney Wood Cranberry, Big George Parcel	5.50	Active-Filing	No
14	AD Makepeace Solar	35.20	Active-Under Construction	Yes
15	Anderson Cranberry Solar	1.50	Withdrawn	No

Plymouth Ground-Mounted Solar Projects - 2016

N
W E
S

An Amendment to Protect Neighborhoods, Preserve Forests, and Enhance Quality of Life

Before the company cleared the trees behind this Plymouth home for their 25-acre solar array you would often see deer wandering along the trails, hear the songs of birds in the morning, enjoy the muted light of the sun through acres of pine and oak and feel extreme temperatures muted or enhanced by its natural insulation.

There was no reason to think this would ever change.

The property depicted here is zoned “Rural Residential” and lies within a state-designated Area of Critical Environmental Concern (ACEC) supposedly “requiring special management attention to protect important historic, cultural and scenic values, fish or wildlife resources or other natural systems or processes.”

Plymouth’s newly adopted and well-intentioned solar bylaw (205-77) provides guidelines for streamlined permitting but reduces the ability of residents to have input into commercial solar projects that dramatically alter their neighborhoods and does not prevent the devaluation of property or protect our highest value forests and habitats.

The proposed Amendment will do just that while helping meet many of the goals of Plymouth’s master plan including maintaining the rural character of the community.

The proposed amendment to the solar bylaw will:

1. Reduce the maximum installation parcel size from 15 to 5 acres in Residential zones;

2. Prohibit GMSPS on parcels identified by the Massachusetts Natural Heritage and Endangered Species Program as Estimated Habitats of Rare Wildlife or Priority Habitats of Rare Species or those located within a designated ACEC;

3. Increase buffers from 75 feet to 150 feet for 1 to 2 MW DC systems;

4. Increase buffers from 150 to 200 feet for systems greater than 2 MW DC;

5. Require the GMSPS owner to notify abutters 14 days prior to the site plan review when a site plan review is required.

Date: January 12, 2017
To: Plymouth Finance Committee
Re: Proposed Solar Bylaw Amendment

The town's own map of proposed and permitted ground mounted solar arrays has a lot to contribute to the debate over the reasonableness of a 5-acre maximum array lot size in residential areas.

Under the existing bylaw, passed just last year, six of fifteen projects approved by the town would not be allowed "by right" today because they exceed – often dramatically – the present 15-acre limit.

More importantly, though opponents of the amendment have argued that a five-acre maximum size would be a de facto ban on solar (suggesting that no commercial developer would consider an array that small) seven of the 15 proposed or permitted arrays on this map are under 5 acres. Another is just a half-acre larger.

The crux of this debate is what size of array is too big, or too small, in a rural, residential area.

The state* breaks down arrays into small, medium and large arrays, and says that a large array is anything over 40,000 square feet, or just 1 acre!

The amendment proposes to allow developers up to five times that size, up to five acres in a residential zone.

The pattern of solar array development in Plymouth, backed up by the state's own definitions, make it clear that five acres is more than enough.

*** Model Zoning for the Regulation of Solar Energy System Department of Energy Resources Massachusetts Executive Office of Energy and Environmental Affairs December 2014**

http://www.mass.gov/eea/docs/doer/green-communities/grant-program/model-solar-zoning.pdf

Solar Energy System, Large-Scale: An Active Solar Energy System that occupies more than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater).

40,000 square feet	=	0.91827364554637
Square foot		Acre

Solar Energy System, Medium-Scale: An Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 - 250 kW DC).

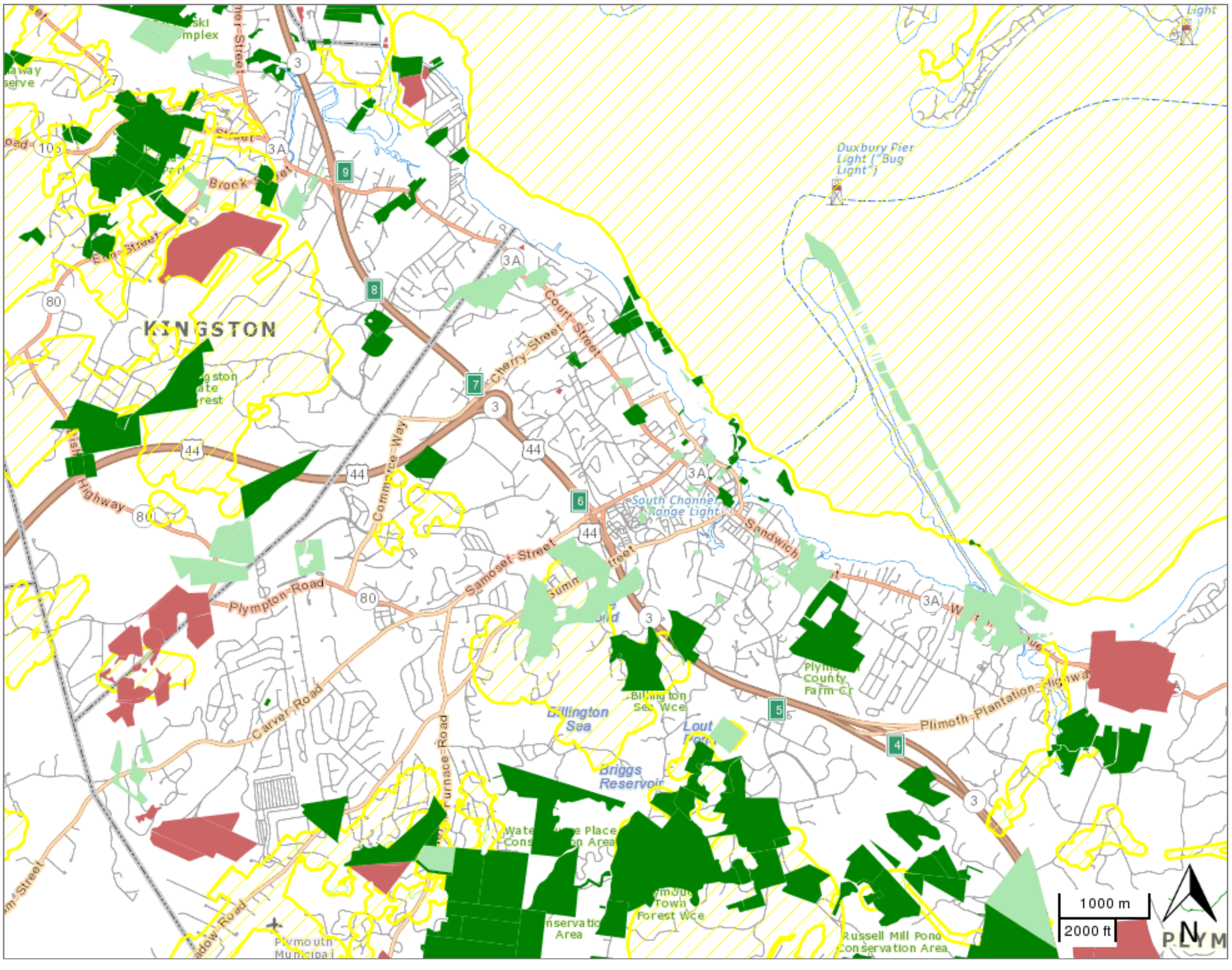
Solar Energy System, Small-Scale: An Active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less).

Siting Preferences (from the document above, page 5)
Where a solar facility is sited, as well as placement on the site once selected, is an important consideration, particularly in regard to large-scale ground mounted facilities. DOER strongly discourages locations that result in significant loss of land and natural resources, including farm and forest land, and encourages rooftop siting, as well as locations in industrial and commercial districts, or on vacant, disturbed land. Significant tree cutting is problematic because of the important water management, cooling, and climate benefits trees provide.

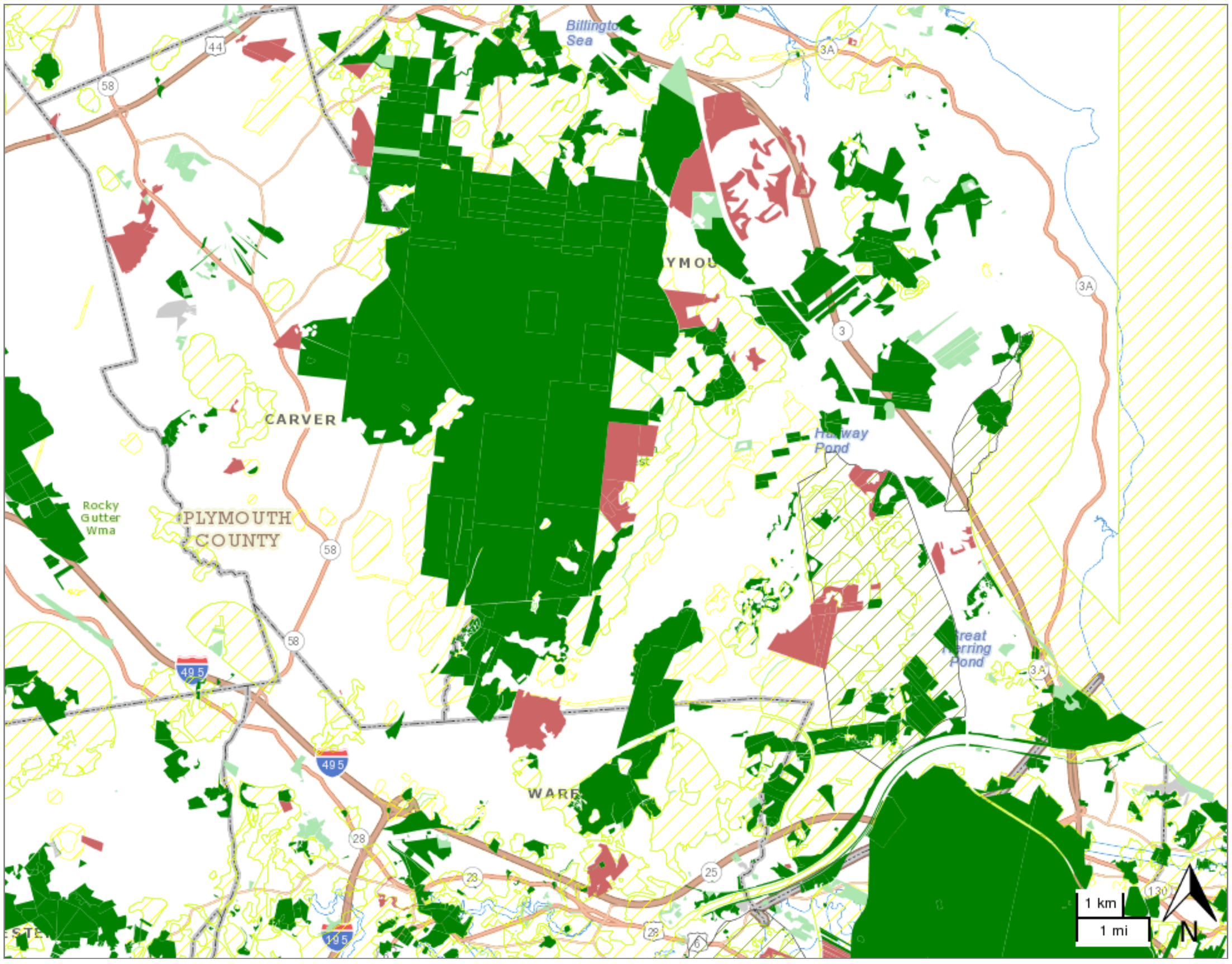
Respectfully submitted,

Sharl Heller
201 Center Hill Road, Plymouth

Plymouth North Open Space Protected



Plymouth South Open Space Protected



Openspace by Level of Prot
- IN PERPETUITY
- LIMITED
- TERM LIMITED
- NONE
- UNKNOWN

Areas of Critical Environmen Concern ACECs

NHESP Priority Habitats of F Species

NHESP Estimated Habitats Wildlife

Detailed Features

Model Zoning for the Regulation of Solar Energy Systems[1]

Department of Energy Resources
Massachusetts Executive Office of Energy and Environmental Affairs
December 2014

This model zoning and accompanying Guidance were prepared to assist Massachusetts cities and towns in establishing reasonable standards to facilitate development of solar energy systems. These systems include small-, medium- and large-scale as well as both ground-mounted and roof-mounted installations.[2] *The model zoning language provided here is not intended for adoption precisely as it is written. Communities will need to carefully consider how this language may be modified to suit local conditions and where it should be inserted into an existing Zoning Bylaw/Ordinance. Further, it is highly recommended that any language adapted from this model be reviewed by municipal counsel prior to adoption.*

As small-, medium-, and large-scale ground-mounted and roof-mounted solar energy systems become more prevalent in Massachusetts, many communities are attempting to regulate the installation of these systems through their Zoning Bylaw/Ordinance. Developing these regulations has been particularly challenging for a number of reasons. Most notably, the Massachusetts General Laws contains several provisions that specifically address the ability of local governments to regulate solar energy systems and/or to protect solar access from development or vegetation (shading) on adjacent properties. While the language within Chapter 40A Section 3 states that a local government may not prohibit these uses, it does say they cannot be "unreasonably regulated" without providing guidance on what that particular phrase means. The Solar Energy Systems Policy Guidance, which accompanies this model zoning and succeeding sections of this document provide more explanation regarding the implications of the statutes on this issue and its significance to local zoning.

Unlike model bylaws/ordinances typically developed by the Commonwealth, the regulatory language provided here is not packaged as a "stand-alone" section of a Zoning Bylaw/Ordinance. With ground-mounted and roof-mounted solar energy systems, the statutory framework and "accessory" nature of some of these installations lend themselves to a different approach. This model zoning therefore assumes that municipalities will have many "typical" sections within their Zoning Bylaw/Ordinance and that several of these sections would be amended to address this issue. For the purposes of this model zoning, the Bylaw/Ordinance sections that are amended include:

[1] This material is based upon work supported by the U.S. Department of Energy under Award Number DE-EE0005692. This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.
[2] This material was prepared by the Horsley Witten Group.

The Definitions Section;
Allowable Uses;
Dimensional Requirements; and
Site Plan Review.

There is also further discussion intended to help communities regulate these systems in the context of a Local Historic District.

Definitions

Commentary: Within a Zoning Bylaw/Ordinance, the Definitions Section usually stands alone. Definitions are also sometimes included as a sub-section within other sections of the Zoning Bylaw/Ordinance. For example, terms related to the protection of water resources may be included in a water resource protection overlay district section. We recommend that the following terms be added to the general Definitions Section of the Zoning Bylaw/Ordinance.

Photovoltaic System (also referred to as Photovoltaic Installation): An active solar energy system that converts solar energy directly into electricity.

Rated Nameplate Capacity: The maximum rated output of electric power production of the photovoltaic system in watts of Direct Current (DC).

Solar Access: The access of a solar energy system to direct sunlight.

Solar Collector: A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy.

Solar Energy: Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Commentary: While it is anticipated that installed solar energy systems will most frequently be photovoltaic, this model zoning uses the statutory definition of a solar energy system, which is broader and permits the installation of solar thermal systems as well.

Solar Energy System: A device or structural design feature, a substantial purpose of which is to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating.

> Solar Energy System, Active: A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means.
>
> Solar Energy System, Grid-Intertie: A photovoltaic system that is connected to an electric circuit served by an electric utility.
>
> Solar Energy System, Ground-Mounted: An Active Solar Energy System that is structurally mounted to the ground and is not roof-mounted; may be of any size (small-, medium- or large-scale).

Solar Energy System, Large-Scale: An Active Solar Energy System that occupies more than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 250kW DC or greater).

Solar Energy System, Medium-Scale: An Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area (equivalent to a rated nameplate capacity of about 10 - 250 kW DC).

Solar Energy System, Off-Grid: A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility.

Solar Energy System, Passive: A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

Solar Energy System, Roof-Mounted: An Active Solar Energy System that is structurally mounted to the roof of a building or structure; may be of any size (small-, medium- or large-scale).

Solar Energy System, Small-Scale: An Active Solar Energy System that occupies 1,750 square feet of surface area or less (equivalent to a rated nameplate capacity of about 10 kW DC or less).

Solar Thermal System: An Active Solar Energy System that uses collectors to convert the sun's rays into useful forms of energy for water heating, space heating, or space cooling.

Use Regulations

Commentary: Within a Zoning Bylaw/Ordinance, the Use Regulations describe which land uses are allowed within different zoning districts of the community, and which permits are required. The Use Regulations typically include a Use Table and/or a narrative description of the principal and accessory uses that are allowed, prohibited and/or allowed only through a Special Permit within each zoning district.

Pursuant to Chapter 40A Section 3, a Massachusetts municipality may not prohibit or unreasonably regulate solar energy systems except where necessary to protect public health, safety or welfare. Therefore, although these systems must be allowed within the community, they may be regulated where necessary to protect public health, safety or welfare through other provisions of the Zoning Bylaw/Ordinance. For example, these systems will still need to meet dimensional regulations and other performance standards necessary to protect public health, safety or welfare. In addition, a Site Plan Review process may be used to collect information that will ensure compliance with the performance standards in the Zoning Bylaw/Ordinance. Where some communities include Design Review in their permit processes, these communities will need to balance their desire for certain design objectives with the Commonwealth's protection of solar energy systems. Finally, as drafted this model zoning requires a special permit for a large-scale ground-mounted facility in a residential district and prohibits such systems in another residential district. While a special permit is discretionary, and language expressing uncertainty and cautioning communities about the lack of case law regarding Chapter 40A Section 3 has been included, the Attorney General's Office has approved local

zoning using this permitting mechanism. While DOER cannot offer a definitive interpretation, limited use of special permits when applied to the largest of solar systems, especially when these systems are allowed elsewhere by right, may well be reasonable regulation. In DOER's view, given the plain language of the statute, it is prudent to allow opportunity to site all scales of solar energy systems somewhere in the community. These provisions are described in more detail in the following sections. A more detailed discussion of DOER's understanding of Chapter 40A Section 3 is provided in the Policy Guidance for Regulating Solar Energy Systems that serves as a companion piece to this regulatory guidance.

As a cautionary note, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on materials, setbacks or height, and other similar items, as related to aesthetics, can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems, or that they do so very cautiously, due to the strong statutory protections in Chapter 40A Section 3.

Two examples are provided in this section for how roof-mounted, small-scale ground-mounted, medium-scale ground-mounted, and large-scale ground-mounted solar energy systems can be incorporated into a municipality's Use Regulations. In these examples, roof-mounted solar energy systems, regardless of size, are allowed as-of-right throughout the community. As-of-right siting means that development may proceed without the need for a Special Permit, variance, amendment, waiver, or other discretionary approval. These projects cannot be prohibited, and can be built once a building permit has been issued by the inspector of buildings, building commissioner or local inspector.

For ground-mounted systems, there is a distinction between how small-scale, medium-scale and large-scale systems are treated and where each are allowed as-of-right, via site plan review, or by special permit. The model zoning allows small-scale ground-mounted systems as-of-right throughout the community. These are of a size that would service a house, small businesses, or small municipal building.

The model zoning allows medium-scale ground-mounted systems as-of-right in all districts except residential zoning districts; in these districts Site Plan Review is required. This means that medium-scale ground-mounted systems cannot be prohibited, and that DOER considers Site Plan Review reasonable regulation. Site Plan Review is discussed in more detail later in this document, but in general it establishes criteria for the layout, scale, appearance, safety, and environmental impacts of certain types and/or scales of development. Typically, site plan approval must be obtained before the building permit is issued. Since medium-scale ground-mounted systems can reach up to approximately an acre in size, DOER believes it is reasonable and appropriate to provide more regulatory scrutiny via Site Plan Review for these projects in residential districts to protect public health, safety, or welfare.

As drafted, the model zoning requires Site Plan Review for large-scale ground-mounted systems within most zoning districts, a special permit in one residential district, and prohibits such systems in another residential district. However, communities should remember that the language of the zoning exemption for solar energy systems is imprecise. While some communities already require a Special Permit to install a large-scale ground mounted solar facility, and/or

restrict them to certain districts, it is not clear whether these regulations are consistent with the Chapter 40A Section 3 mandate that they be reasonable and necessary to protect public health, safety, or welfare.

Connection to the Massachusetts Green Communities Designation and Grant Program
Recognizing the uncertainty around how regulations may or may not be interpreted as reasonable, DOER allows communities to meet Green Communities Criterion One by zoning for the as-of-right installation of a solar facility of at least an acre in size in a designated location. For more information on the Green Communities Designation and Grant Program, please visit: http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/.

Siting Preferences
Where a solar facility is sited, as well as placement on the site once selected, is an important consideration, particularly in regard to large-scale ground mounted facilities. DOER strongly discourages locations that result in significant loss of land and natural resources, including farm and forest land, and encourages rooftop siting, as well as locations in industrial and commercial districts, or on vacant, disturbed land. Significant tree cutting is problematic because of the important water management, cooling, and climate benefits trees provide.

In regard to farm properties, rooftops are preferable. If roof space is inadequate non-productive, non-arable agricultural land is the second choice. Should this also prove infeasible or inadequate a dual use of land design concept could preserve productive farmland by continuing crop production underneath high-mounted and well spaced panels. Finally, if none of these are feasible or they are inadequate the least productive land should be used first to minimize the loss of productive food/crop land.

Overlay Zoning Districts
Overlay zoning districts are one zoning approach that could be used to permit solar energy systems, and in ways not allowed under the base zoning districts. For example, the model zoning as drafted requires Site Plan Review for medium-scale ground mounted solar energy systems in residential districts. An overlay district could be used to permit such facilities without Site Plan Review in a portion of these residential districts where Site Plan Review is deemed unnecessary, while retaining the review for the balance of the districts.

In addition, some communities may wish to conduct a feasibility analysis to determine where large-scale solar energy systems are most appropriate within the municipality and use an overlay zoning district approach to encourage the siting of facilities in the most feasible locations. Once an area has been established through a thoughtful and analytical process, the municipality could enact overlay zoning legislation to prioritize these areas for large-scale solar energy systems. Many Massachusetts communities have already taken this approach through adoption of a large-scale ground-mounted solar overlay district, often based on DOER's Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations.

Agricultural Exemption:
In addition to the exemption pertaining to solar energy systems Section 3 of Chapter 40A also exempts agricultural uses from zoning regulations that would otherwise apply. Thus, when the majority of the power from a solar energy system (or a wind turbine) is integral to farm production construction and operation of the system would covered by the exemption. Questions on the applicability of the agricultural exemption to solar energy systems should be directed to Gerry Palano at the Dept. of Agricultural Resources (Gerald.Palano@state.ma.us or 617-626-1706).

Example 1 (Use Tables):

	Residential-1 (R1)	**Residential-2 (R2)**	**Residential-3 (R3)**	**Commercial (C)**	**Industrial (I)**	**Public (P)**
PRINCIPAL USE						
Medium-Scale Ground-Mounted Solar Energy System	SPR	SPR	SPR	Y	Y	Y
Large-Scale Ground-Mounted Solar Energy System	SP	N	SPR	SPR	SPR	SPR

Y = Allowed N = Prohibited
SP = Special Permit SPR = Site Plan Review

	Residential-1 (R1)	**Residential-2 (R2)**	**Residential-3 (R3)**	**Commercial (C)**	**Industrial (I)**	**Public (P)**
ACESSORY USE						
Roof-Mounted Solar Energy System	Y	Y	Y	Y	Y	Y
Small-Scale Ground-Mounted Solar Energy System	Y	Y	Y	Y	Y	Y
Medium-Scale Ground-Mounted Solar Energy System	SPR	SPR	SPR	Y	Y	Y

Y = Allowed N = Prohibited
SP = Special Permit SPR = Site Plan Review

Example 2 (Uses listed):

1.0 Residential District Uses

1.1 Uses Permitted

1.1.1 Roof-Mounted Solar Energy Systems
1.1.2 Small-Scale Ground-Mounted Solar Energy Systems

1.2 Uses Allowed through Site Plan Review

1.2.1 Medium-Scale Ground-Mounted Solar Energy Systems
1.2.2 Large-Scale Ground-Mounted Solar Energy Systems in the R3 District

1.3 Uses Allowed via Special Permit

1.3.1 Large-Scale Ground-Mounted Solar Energy Systems in the R1 District

2.0 Non-Residential District Uses

2.1 Uses Permitted

2.1.1 Roof-Mounted Solar Energy Systems
2.1.2 Small-Scale Ground-Mounted Solar Energy Systems
2.1.3 Medium-Scale Ground-Mounted Solar Energy Systems

2.2 Uses Allowed through Site Plan Review

2.2.1 Large-Scale Ground-Mounted Solar Energy Systems

Dimensional Regulations

Commentary: In most cases, the existing dimensional standards in a Zoning Bylaw/Ordinance will allow for the development of small-, medium-, and large-scale solar energy systems. However, if a municipality finds alternate dimensional standards are necessary to allow solar energy systems while protecting public health, safety, or welfare, it may impose them. As a reminder, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on dimensional standards, such as setbacks or height, as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems due to the strong statutory protections in Chapter 40A Section 3, or that they do so very carefully.

With regard to more basic dimensional requirements such as setbacks from the property line, municipalities may also find that adjustments can be made to encourage broader use of solar energy systems. Below is a series of dimensional regulation amendments that a municipality could adopt to further encourage small-, medium-, and large-scale ground-mounted and roof-mounted solar energy systems, or simply clarify requirements pertaining to them.

<u>Height</u>

Commentary: It is recommended that for purposes of height, roof-mounted solar energy systems should be considered similar to chimneys, television antennae, roof-top mechanical equipment and other appurtenances that are usually either allowed a much higher maximum height (e.g., 100 feet instead of 35 feet) or are exempted altogether from building height requirements. Such

an exemption can be stated in the definition of "Building Height" or through language similar to that provided in the following example.

It is recommended that existing zoning district height limitations apply for all ground-mounted solar energy systems. If the ground-mounted solar energy system is accessory to a principal building or structure on a lot, then the height restriction for accessory structures would apply. If the ground-mounted solar energy system is the principal structure on a lot, then the height restriction for principal structures would apply.

Example:

1.0 Building Height Regulations

1.1 Exemptions

1.1.1 Mechanical equipment and appurtenances necessary to the operation or maintenance of the building or structure itself, including chimneys, ventilators, plumbing vent stacks, cooling towers, water tanks, broadcasting and television antennae and roof-mounted solar energy systems.

<u>Setbacks</u>

Commentary: It is recommended that small- and medium-scale ground-mounted solar energy systems that are accessory to a primary building or structure on a lot be provided with more flexible setback requirements than those that would typically apply to a primary structure. Many communities already provide some flexibility for "accessory structures" like sheds, allowing these to be closer to the lot line than the primary structure. For example, where a front/side/rear yard setback for the primary structure may be 50 feet, setbacks of 20 feet may be allowed for accessory structures. When ground-mounted solar energy systems are developed as accessory structures to a home, business or other building or structure, they should be afforded at least the same flexibility.

If a community does not have this type of reduced setback already built into the Zoning Bylaw/ Ordinance, a provision could be added that effectively reduces the setback distance just for this use. For example, if the community has a dimensional table, a special footnote could be added to the dimensional table as indicated in the following examples. It should be noted that often times there is a distinction between how accessory structures are regulated in a residential zoning district and how they are regulated in a commercial or industrial district. Therefore, communities should ensure that provisions for flexible setbacks for small- and medium-scale ground-mounted solar energy systems are incorporated wherever appropriate.

The first example applies a reduction of 50% to the otherwise required setbacks for accessory uses. The value of 20 feet is used in the second example; however, this may be altered based on local conditions. For example, in some communities, particularly urban communities, the required side- and rear-yard setback distances may be shorter than 20 feet. In these

circumstances, the existing shorter setback distances should remain for small- and medium-scale ground-mounted solar energy systems.

As opposed to small- and medium-scale ground-mounted solar energy systems, which are typically sited as accessory to a principal building or structure on a lot, large-scale ground-mounted solar energy systems are usually sited as principal structures. Whenever a solar energy system is sited as a principal structure on a lot, it is recommended that the setback requirements for principal structures in that zoning district apply. Regardless of the scale of the system or the minimum setback required solar energy system installers often allow a sufficient setback to avoid the issue of shading by vegetation on neighboring properties.

Placement of solar energy systems in front yards should be avoided if at all possible. However, in DOER's view the statutory protections for solar energy systems create a situation where a ground-mounted array could not be prohibited outright in a front yard, so the language provided in the following example includes a standard for the front yard setback. DOER recognizes the concerns this may raise in residential neighborhoods and acknowledges that communities should work with property owners to find appropriate locations for ground-mounted systems in side or rear yards.

Example Dimensional Table Footnotes for Accessory Installations:

(1) Small- and medium-scale ground-mounted solar energy systems accessory to principal use may be located no closer than [1/2 of the setback that would otherwise apply] from the front, side or rear lot line. All ground-mounted solar energy systems in residential districts shall be installed either in the side yard or rear yard to the extent practicable

(2) Small- and medium-scale ground-mounted solar energy systems accessory to a principal use may be located no closer than [twenty (20) feet] from the front, side or rear lot line. All ground-mounted solar energy systems in residential districts shall be installed either in the side yard or rear yard to the extent practicable.

Lot Coverage

Commentary: A number of communities use "maximum lot coverage" or "maximum impervious surface" as one of their dimensional standards. While it is clear that such features as driveways or buildings would be included in any calculation of lot coverage, many other features may be more ambiguous depending on how clearly the definition in the Zoning Bylaw/Ordinance is written. Awnings, porches, decks and similar features can often become a matter of dispute. Regardless of the definition, it is recommended that solar energy systems with grass or another pervious surface under them be exempted from lot coverage or impervious surface calculations. If the area is to be paved or otherwise rendered impervious then this land area should in fact count toward any coverage or impervious surface limit. It is also important to note that this recommended exemption is not intended to apply to municipal stormwater regulations, as the panels could have the effect of altering the volume, velocity, and discharge pattern of stormwater runoff. The following provision could be included as a footnote to the Dimensional Table related

to maximum lot coverage and impervious cover requirements, or as a separate provision within the dimensional regulations.

Example:

Solar energy systems shall not be included in calculations for lot coverage or impervious cover as defined in [INSERT SECTION REFERENCE FOR 'DEFINITIONS'].

Site Plan Review Requirements and Performance Standards

Commentary: Although not specifically addressed under Chapter 40A, Site Plan Review is included within the local Zoning Bylaws/Ordinances of many Massachusetts communities. Site Plan Review is meant to enforce clear and fair design standards for different types of development. This is typically done through a coordinated review process that circulates development applications among, and invites input from, all local boards and commissions that might permit a project, including Local Historic District Commissions as applicable. Site Plan Review is usually triggered by either specific types of uses (e.g., commercial or industrial development), or certain scales of uses (e.g., non-residential buildings over 5,000 square feet).

Typically, Site Plan Review procedures and requirements are provided within a separate section of the Zoning Bylaw/Ordinance. However, there are instances when communities provide separate Site Plan Review provisions and procedures within a section pertaining to a particular use or development type (e.g., Planned Business Development, etc.). Consistent with the Legislature's intent to facilitate the siting of solar energy, communities should shape the Site Plan Review provisions of their Zoning Bylaws/Ordinances to enable large-, medium- and small-scale solar energy system projects to proceed without undue delay.

Model language for Site Plan Review for medium-scale ground-mounted solar energy systems is provided in the following Example 1. As discussed earlier in this document, Site Plan Review may be appropriate when medium-scale ground-mounted systems are sited within residential districts. The model language provided in Example 1 below is based on, but is less stringent than, the provisions in the Massachusetts DOER Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations.

Example 2 provides model language for Site Plan Review for large-scale ground-mounted solar energy systems when they are permitted as of right. As discussed earlier in this document, Site Plan Review may be appropriate for large-scale ground-mounted systems when they are sited anywhere within the community. The model language provided in Example 2 below is based on the provisions in the Massachusetts DOER Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations. Example 2 is also intended for use in concert with the special permit language in the next section of this model zoning.

Example 3 provides model language for roof-mounted and small-scale ground-mounted systems when they are part of a larger project where Site Plan Review is triggered through another threshold (e.g., commercial development, non-residential buildings over 5,000 square feet, etc.). It is important to note that the installation of roof-mounted or small-scale ground-mounted solar

energy systems does not trigger Site Plan Review on its own. However, when such systems are included as part of a larger development proposal that requires Site Plan Review, the municipality has the opportunity to review the roof-mounted or small-scale ground-mounted solar energy systems as part of the larger proposal.

As discussed earlier in this document, while regulating aesthetics can arguably be considered a matter of protecting public welfare, attempting to place restrictions on solar energy systems as they relate to aesthetics can create roadblocks to actual installation. It is therefore not recommended that communities regulate aesthetics of solar energy systems, or that they do so very cautiously, due to the strong statutory protections in Chapter 40A Section 3. However, where communities already have Site Plan Review standards that relate to aesthetics, such as screening requirements, these standards should also apply to solar energy systems. In other words, solar energy systems should not be singled out and regulated more stringently than other uses that require Site Plan Review; however, they can be held to the same level of restrictions that are in place for other uses.

<u>Example 1 (Site Plan Review provisions for medium-scale ground-mounted solar energy systems in residential zoning districts)</u>:

1.0 Site Plan Review

1.1 Applicability

1.1.1 Medium-scale ground-mounted solar energy systems proposed within residential zoning districts shall undergo Site Plan Review prior to construction, installation or modification as provided in this section.

1.2 Site Plan Document Requirements

Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority:

1.2.1 A site plan showing:

(a) Property lines and physical features, including roads, for the project site;
(b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
(c) Blueprints or drawings of the solar energy system showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;

(d) Documentation of the major system components to be used, including the panels, mounting system, and inverter;
(e) Name, address, and contact information for proposed system installer;
(f) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
(g) The name, contact information and signature of any agents representing the project proponent; and
(h) Zoning district designation for the parcel(s) of land comprising the project site.

If the following are not addressed in existing site plan review regulations, then the community may wish to include them:

(i) Locations of active farmland and prime farmland soils, wetlands, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and "Important Wildlife Habitat" mapped by the DEP.
(j) Locations of floodplains or inundation areas for moderate or high hazard dams;
(k) Locations of local or National Historic Districts;

1.2.2 Proof that the project proponent will meet the required Site Plan Review notification procedures.

Commentary: Provision 1.2.2 above should reference the municipality's existing Site Plan Review public and/or abutter notification procedures if applicable. For example, a community may require projects that are subject to Site Plan Review to notify all property owners within 100 feet of the project site.

1.3 Site Plan Review Design Standards

1.3.1 Standards for medium-scale ground-mounted solar energy systems proposed within residential zoning districts

1.3.1.1 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

1.3.1.2 Utility Connections - Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

1.3.1.3 Safety - The medium-scale ground-mounted solar energy system owner or operator shall provide a copy of the Site Plan Review application to the local fire chief. All means of shutting down the solar installation shall be clearly marked.

Commentary: With regard to issues of access and safety, communities looking to adopt zoning for medium-scale solar energy systems should be aware of any unique local requirements that could apply. For example, if the fire department will want an Emergency Response Plan as part of approval, this should be folded into the review process as seamlessly as possible.

1.3.1.4 Visual Impact – Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to minimize visual impacts by preserving natural vegetation, screening abutting properties, or other appropriate measures.

1.3.1.5 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of ground-mounted solar energy systems or as otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

Commentary: As drafted, this model zoning does not require medium-scale ground mounted solar energy systems to be fenced, but this is something communities will want to consider. Regardless, many project proponents will find fencing prudent.

<u>Example 2 (Site Plan Review provisions for large-scale ground-mounted solar energy systems)</u>:

1.0 Site Plan Review

1.1 Applicability

1.1.1 Large-scale ground-mounted solar energy systems shall undergo Site Plan Review prior to construction, installation or modification as provided in this section.

1.2 Site Plan Document Requirements

Pursuant to the Site Plan Review process, the project proponent shall provide the following documents, as deemed applicable by the Site Plan Review Authority:

1.2.1 A site plan showing:

(a) Property lines and physical features, including roads, for the project site;
(b) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
(c) Blueprints or drawings of the solar energy system signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system, any potential shading from nearby structures, the distance between the proposed solar collector and all property lines and existing on-site buildings and structures, and the tallest finished height of the solar collector;
(d) One or three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all Massachusetts Electric Code (527 CMR 12.00) compliant disconnects and overcurrent devices;
(e) Documentation of the major system components to be used, including the panels, mounting system, and inverter;
(f) Name, address, and contact information for proposed system installer;
(g) Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
(h) The name, contact information and signature of any agents representing the project proponent; and
(i) Zoning district designation for the parcel(s) of land comprising the project site.

If the following are not addressed in existing site plan review regulations, then the community may wish to include them:

(j) Locations of active farmland and prime farmland soils, wetlands, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and "Important Wildlife Habitat" mapped by the DEP.
(k) Locations of floodplains or inundation areas for moderate or high hazard dams;
(l) Locations of local or National Historic Districts;

1.2.2 Documentation of actual or prospective access and control of the project site (see also Section 1.3.1.1);
1.2.3 An operation and maintenance plan (see also Section 1.3.1.2);
1.2.4 Proof of liability insurance; and
1.2.5 A public outreach plan, including a project development timeline, which indicates how the project proponent will meet the required Site Plan Review notification procedures and otherwise inform abutters and the community.

Commentary: Provision 1.2.6 above should reference the municipality's existing Site Plan Review public and/or abutter notification procedures if applicable. For example, a community may require projects that are subject to Site Plan Review to notify all property owners within 100 feet of the project site.

1.3 Site Plan Review Design and Operation Standards

1.3.1 Standards for large-scale ground-mounted solar energy systems

1.3.1.1 Site Control - The project proponent shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar energy system.

1.3.1.2 Operation & Maintenance Plan - The project proponent shall submit a plan for the operation and maintenance of the large-scale ground-mounted solar energy system, which shall include measures for maintaining safe access to the installation, stormwater controls, as well as general procedures for operational maintenance of the installation.

1.3.1.3 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

1.3.1.4 Lighting - Lighting of large-scale ground-mounted solar energy systems shall be consistent with local, state and federal law. Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Where feasible, lighting of the solar energy system shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

1.3.1.5 Signage - Signs on large-scale ground-mounted solar energy systems shall comply with a municipality's sign bylaw/ordinance. A sign consistent with a municipality's sign bylaw/ordinance shall be required to identify the owner and provide a 24-hour emergency contact phone number. Solar energy systems shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the solar energy system.

1.3.1.6 Utility Connections - Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

1.3.1.7 Emergency Services – The large-scale ground-mounted solar energy system owner or operator shall provide a copy of the project summary, electrical schematic, and site plan to the local fire chief. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the solar energy system shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.

Commentary: With regard to issues of access and safety, communities looking to adopt zoning for large-scale solar energy facilities should be aware of any unique local requirements that could apply.

1.3.1.8 Land Clearing, Soil Erosion and Habitat Impacts - Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of solar energy system or otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

1.3.2 Monitoring and Maintenance

1.3.2.1 Solar Energy System Installation Conditions - The large-scale ground-mounted solar energy system owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief, Emergency Management Director, and Emergency Medical Services. The owner or operator

shall be responsible for the cost of maintaining the solar energy system and any access road(s), unless accepted as a public way.

1.3.2.2 Modifications - All material modifications to a large-scale ground-mounted solar energy system made after issuance of the required building permit shall require approval by the Site Plan Review Authority.

1.3.3 Abandonment or Decommissioning

1.3.3.1 Removal Requirements

Any large-scale ground-mounted solar energy system which has reached the end of its useful life or has been abandoned consistent with Section 1.3.3.2 of this bylaw/ordinance shall be removed. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The owner or operator shall notify the Site Plan Review Authority by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

(a) Physical removal of all solar energy systems, structures, equipment, security barriers and transmission lines from the site.
(b) Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
(c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Review Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

1.3.3.2 Abandonment

Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the large-scale ground-mounted solar energy system shall be considered abandoned when it fails to operate for more than one year without the written consent of the Site Plan Review Authority. If the owner or operator of the solar energy system fails to remove the installation in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the town retains the right, after the receipt of an appropriate court order, to enter and remove an abandoned, hazardous, or decommissioned large-scale ground-mounted solar energy system. As a condition of Site Plan approval, the applicant and landowner

shall agree to allow entry to remove an abandoned or decommissioned installation.

Commentary: Recognizing that other remedies, such as a tax lien, are available to communities in the event an abandoned facility is legitimately putting public safety at risk this model zoning does not require the provision of surety to cover the cost of removal in the event the municipality must remove the installation and remediate the landscape. Communities can, however, require surety in circumstances where a valid planning purpose for doing so exists.

Commentary: As drafted, this model zoning does not require large-scale ground mounted solar energy systems to be fenced, but this is something communities will want to consider. Regardless, many project proponents will find fencing prudent.

Example 3 (Site Plan Review provisions for roof-mounted and small-scale ground-mounted solar energy systems as part of a larger project that triggers Site Plan Review):

1.0 Site Plan Review

1.1 Site Plan Document Requirements

1.1.1 Requirements for Roof-Mounted and Small-Scale Ground-Mounted Solar Energy Systems - Where these solar energy systems may be accessory to a use allowed through Site Plan Review, the Site Plan Review shall include review of their adequacy, location, arrangement, size, design, and general site compatibility.

1.1.1.1 Roof-Mounted Solar Energy Systems – For all roof-mounted systems, the applicant shall provide:

(a) The shortest distance between the solar collector and all edges of the roof.
(b) The distance between the solar collector and any other existing rooftop features such as chimneys, spires, access points, etc.
(c) The height of the solar collector both from finished grade and, where applicable, from the finished surface of the roof.

1.1.1.2 Small-Scale Ground-Mounted Solar Energy Systems – For all ground-mounted systems, the applicant shall provide:

(a) The distance between the proposed solar collector and all property lines and existing on-site buildings and structures.
(b) The tallest finished height of the solar collector.
(c) Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures.

1.1.1.3 System Components – The Plan must include documentation of the major system components to be used, for example the panels, mounting system, and inverter.

1.1.1.4 Installer Details – The Plan must include the name, address, and contact information for proposed system installer.

1.2 Site Plan Review Design Standards

1.2.1 Standards for roof-mounted and small-scale ground-mounted solar energy systems

1.2.1.1 Utility Notification - No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

1.2.1.2 Emergency Access - Solar energy systems shall be located in such a manner as to ensure emergency access to the roof, provide pathways to specific areas of the roof, provide for smoke ventilation opportunities, and provide emergency egress from the roof.

(a) For buildings with pitched roofs, solar collectors shall be located in a manner that provides a minimum of one three-foot wide clear access pathway from the eave to the ridge on each roof slope where solar energy systems are located as well as one three-foot smoke ventilation buffer along the ridge.

(b) Residential rooftops that are flat shall have a minimum three-foot wide clear perimeter and commercial buildings that are flat shall have a minimum four-foot wide clear perimeter between a solar energy system and the roofline, as well as a three-foot wide clear perimeter around roof-mounted equipment such as HVAC units.

(c) To the extent practicable, the access pathway shall be located at a structurally strong location on the building (such as a bearing wall).

Commentary: Building and Fire Department personnel should be involved in the development of emergency access standards, and any zoning standards that are adopted should be consistent with local building and fire codes.

1.2.1.3 Safety – No roof-mounted solar energy system shall be located in a manner that would cause the shedding of ice or snow from the roof into a porch, stairwell or pedestrian travel area.

Special Permits

Commentary: Special Permits are addressed in Chapter 9 of the Zoning Act, and most Massachusetts communities have regulations pertaining to them within their zoning bylaw or ordinance. Below is model language for municipalities requiring special permits for large-scale ground-mounted solar energy systems. It is intended to be adopted and implemented alongside Site Plan Review language for large-scale ground-mounted systems included as Example 2 in this model zoning. Rather than include separate special permit standards applicable specifically to large-scale ground-mounted solar energy systems, this language simply directs that a permit be issued pursuant to the already established special permit bylaw/ordinance of the community.

Municipalities will, however, want to audit their special permit language, especially the approval standards, for compatibility with the siting of large-scale ground-mounted solar energy systems. Such systems should have far lower impacts than commercial or industrial uses that often require issuance of special permit, and communities should keep in mind the requirement in Chapter 40A Section 3 that any regulations pertaining to solar energy systems be reasonable.

1.0 Special Permit with Site Plan Review

1.1 Special Permit Requirements

1.1.1 Where required a special permit shall be issued prior to construction, installation or modification of any large-scale ground-mounted solar energy system. The special permit granting authority shall include as part of its special permit review and proceedings all the provisions and requirements of the Site Plan Review standards applicable to large-scale ground-mounted solar energy systems.

Pre-Existing Non-Conforming Uses and Structures

Commentary: Alterations, extensions and structural changes to pre-existing non-conforming uses and structures (e.g., existing buildings that do not meet the dimensional requirements of the Zoning Bylaw/Ordinance) that intensify non-conformities or result in additional non-conformities may not be allowed beyond a certain threshold or may require a Special Permit pursuant to the local Zoning Bylaw/Ordinance. It is recommended that the installation of roof-mounted or small-scale ground-mounted solar energy systems associated with pre-existing non-conforming uses or structures be exempt from this requirement. An example provision is provided below. Communities not comfortable with providing this exemption to small-scale ground mounted systems due to their potential to be located on very small lots may wish to apply Site Plan Review or continue to require a Special Permit where this can be justified to protect public health, safety, or welfare. As to roof mounted systems on non-conforming properties, given the exemption afforded solar energy systems, DOER believes it would be unreasonable to disallow them or require a Special Permit even when installation would exacerbate a pre-existing building height non-conformity.

Example:

1.0 Pre-Existing Non-Conforming Uses and Structures

1.1 Improvements that do not change the use or the basic exterior characteristics or appearance of the building or structure are allowed. Such improvements include but are not limited to the following:

1.1.1 Installation or replacement of solar energy systems.

Historic Districts

Commentary: Many communities in the Commonwealth have adopted Local Historic Districts to protect and preserve buildings, landscapes and neighborhoods of historic significance. In recent years, conflict has occasionally arisen about the installation of solar energy systems within these districts on historic buildings and structures, since some argue that they have adverse impacts on the visual appearance and integrity of the buildings and structures.

As described in the DOER Policy Guidance for Regulating Solar Energy Systems, Local Historic District Commissions must consider the policy of the Commonwealth to encourage the use of solar energy systems and to protect solar access when considering issuance of a certificate of appropriateness for a solar energy system. However, thoughtful design guidelines can help ensure that solar energy systems are sited while the goals of historic preservation continue to be achieved.

Design guidelines can require that solar energy systems not be visible from public areas, to the greatest extent practicable. When it is not feasible (either physically or economically) to locate solar energy systems out of the public eye, solar energy systems can be required to be designed to certain architectural standards (e.g., building-integrated, use of solar shingles) to the greatest extent practicable. However, these options may be infeasible as well due to the high cost and low performance of many of these technologies. To meet these challenges, Local Historic District Commissions are encouraged to write design guidelines that support the development of solar energy systems and are sensitive to the historic preservation goals of the Commission.

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Plymouth town counsel says prohibiting solar arrays in residential districts makes sense

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That ticking noise you hear may be the end of solar arrays in residential areas of Plymouth.

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PLYMOUTH - That ticking noise you hear may be the end of solar arrays in residential areas of Plymouth.

Town Counsel Mark Reich of KPLaw, in ruling on an amendment to a proposed solar bylaw (Article 26 of Saturday's Town Meeting) dropped that ticking bomb, suggesting that whatever happens at Town Meeting there is a strong legal argument for opposing arrays in residential areas.

Town Meeting Rep. Bill Abbott's proposed amendment, if the bylaw was approved by Town Meeting, would have done just that: eliminate arrays in residential areas.

But because Abbott's amendment was proposed late in the process (after the language of the bylaw had been set, the warrant article printed) Abbott's amendment language was forwarded to Reich for review.

Reich said yes, the language was fine, but then went on.

"In my opinion," Reich noted at the end of his comments on the amendment, "prohibiting large solar installations in residential districts, while allowing such installations in other districts, is not an unreasonable regulation. See Briggs v. Zoning Board of Appeals of Marion, 22 LCR 45 (2014)."

In 2014 the judge in the Briggs v. Zoning Board of Appeals case ruled that:

• The ZBA Decision, which prohibits large scale commercial solar farms in a residential district, appears to be rational.

• "Separation of residential and commercial districts is a longstanding purpose of zoning... designed to protect residence against business."

• Primary uses that are commercial are prohibited in residential districts.

• Zoning ordinances are intended to apply uniformly and divide land into compatible uses to have a predictive quality

• Therefore, provided that the ZBA can justify a finding that a solar energy farm is "light manufacturing" under the Bylaws, I find that the ZBA Decision, which maintains the division between commercial solar energy systems and residential accessory solar energy uses, is reasonable and does not violate G.L. c. 40A, §3.

This appears to be an important admission by Reich, in that it echoes what Attorney Margaret Sheehan, representing abutters who have appealed several proposed Plymouth solar arrays, has been arguing for more than a year.

If the town had adopted that approach - using regulations already on the books that prohibited commercial arrays in residential areas - many of the 14 approved arrays in town would not exist today, at least not at their present locations.

Comments from town officials were sought early Friday, but as this story went to press no responses had been received.

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