

June 24, 2022
220329

Michele Gagnon, Planning Director
Town of Bar Harbor
93 Cottage Street, Suite 1
Bar Harbor, Maine, 04609-1400

RE: Peer Review of SP-2022-02 Bar Harbor Community Solar - Visual Impact

Dear Ms. Gagnon,

Sebago Technics, Inc (Sebago) was contracted by the Town of Bar Harbor to peer review the visual impact and proposed landscape buffer mitigation for the Bar Harbor Community Solar Project (Project) proposed by BRI Environmental (Applicant) for compliance with the Town of Bar Harbor Zoning Ordinance. Sebago completed zoning research, fieldwork including site photography from abutting properties (with permission of land owner), and 3D Modeling Overlay to evaluate the proposed application.

Summary of Findings:

Based on the methodology and evaluation outlined in detail below, Sebago has determined the currently proposed Landscaping, Buffering & Screening Plan is insufficient to screen the project in a reasonable amount of time and is not in compliance with ***Sections 125-69 Z. (3) 4.[d] Retaining or planting vegetation to obscure views of the SPVS-PU*** of the Town Ordinance. Sebago recommends requiring the applicant to plant additional evergreen trees within the proposed 20' buffer and increase the size of the multi-stemmed understory trees to more effectively mitigate the proposed visual impact.

Sebago also recommends the applicant revise '*Viewpoint 3: Stanley Property – Near Property Line*' from the Stanley property to more realistically represent the trees to be retained within the 25' buffer along the property line and more accurately locate the proposed trees in Year 5 and 10 in compliance with ***Sections 125-69 Z.(3)(c)[1] A photomontage, field mockup, or other technique(s) to identify the potential visual impacts, at design capacity, of the SPVS-PU on sensitive resources and adjacent properties.***

Field Methodology:

Staff from Sebago visited the project site area and residential roads in direct proximity to the project, including Fern Meadow Drive and Lupine Way, on June 14, 2022. GPS located photographs were taken from each of the four viewpoints used for the visualizations prepared by TJD&A. Photographs were taken with a SONY A7R digital camera with a fixed 50mm lens. The photo location points were collected with ArcGIS Survey123 on a mobile device connected to an external Bad Elf GNSS Surveyor (BE-GPS-3300) GPS unit. Reported accuracies were approximately ~5ft horizontal – vertical data was not collected.

Prior to photographing from the Viewpoint 2 and 3 locations on the Stanley property, Sebago tied pink survey tape to trees identified as the edge of the proposed limit of disturbance (blue and white striped

tape) and orange survey tape to the back of the proposed 20' landscape buffer. The survey tape served as a guide to determine which trees would be preserved and where the landscape buffer would be placed in relation to the proposed solar panels. The tape was located at approximately 5' above grade.

Visualization accuracy review

Sebago prepared a 3D Model of the proposed project to determine general accuracy of the visualizations and effectiveness of the proposed landscape buffer prepared by TJD&A using the CAD file named 'Bar Harbor Solar-Base Plan (04-11-22)' provided by BRI and the Digital Elevation Models (DEMs) prepared by Sebago. The proposed Landscape Buffer plant material prepared by TJD&A was located in the model and shown at heights at planting (Day 1), Year 5 and Year 10 based on growth rates of the individual species listed on the Landscaping, Buffering & Screening Plan.

LiDAR for 3D Model Overlay Methodology:

Ground and tree elevation data was processed using Geographic Information System (GIS) mapping software Global Mapper v20. The primary analysis was performed using publicly available LiDAR, an airborne active remote sensing technique utilizing rapid pulse laser light scanning. The dataset used is distributed through the National Oceanic and Atmospheric Administration (NOAA) and collected by the 2011 U.S. Geological Survey Topographic LiDAR: LiDAR for the North East project between 12-20-2010 & 12-11-2011 on horizontal datum NAD83, vertical datum NAVD88, US Foot, with a 2-meter ground sample distance or better and a bare earth vertical accuracy of 15 centimeters (0.49 ft).

The raw LiDAR point cloud was used to create two separate Digital Elevation Models (DEMs): 1.) a Digital Terrain Model (DTM) representing actual ground elevation; and 2.) a Digital Surface Model (DSM) representing the elevations of actual features such as buildings and trees. LiDAR points were filtered to Last Return ground classification only in construction the DTM, while 'First' and 'First of Many' Returns for all non-ground classification types were used to create the DSM. Both DEMs were created via a Triangulated Irregular Network (TIN) at a 3-foot grid, classifying any elevation grid cell over 2ft from a known elevation point as "No Data".

Town of Bar Harbor Zoning Ordinance Review

Sebago reviewed the *Bar Harbor_BRI Solar_Application Update dated May 25, 2022* for compliance with the Town of Bar Harbor Zoning Ordinance, specifically the updated Buffer Planting Plan/Exhibit 4: Integrated Vegetation Maintenance Plan; Exhibit 11 Landscaping, Buffering & Screening Plan dated May 31, 2002; Exhibit 9: Tree Survey; and Exhibit 14 Photographs/Additional Visual Simulations.

On page 34, **Exhibit 4: Integrated Vegetation Maintenance Plan** it states: *Additionally, the Project is proposing the installation of vegetative screening of an area approximately 20' wide and 490 feet long at the southwest border of the Project Limit of Disturbance. Native species will be planted between the proposed 25-foot buffer of existing vegetation and the Project fence to increase the visual buffer between the Project and the abutters on Lupine Way and Fern Meadow Drive.*

The applicant has proposed to use *Acer pensylvanicum* (Striped Maple), *Crataegus viridis* 'Winter King' (Hawthorne), *Hamamelis vernalis* (Witchhazel), *Picea abies* (Norway Spruce), and *Picea Glauca* (White Spruce). All of these species are hardy for the location, and when planted at the appropriate densities, will provide an acceptable screen within 7 to 10 years of growth.

However, based on field observations from Viewpoints 2 and 3, a review of the 25' wide vegetated buffer to remain, and the model overlays developed by Sebago Technics, it is

recommended the applicant increase the density of evergreen tree plantings (Norway Spruce and White Spruce) to a minimum depth of two staggered evergreen trees within the 20' buffer, specifically adjacent to rear property line of the Stanley property.

Also of note, Norway Spruce is not a native tree to Maine but will be an effective evergreen buffer tree. If the requirement for the buffer is to be a native species (a specific requirement for native species was not found in the ordinance), Sebago recommends Balsam Fir be considered. We understand the abutter, Mrs. Stanley, suggested the plants that are currently on the Landscape Buffer and Screening Plan.

Review Town of Bar Harbor Ordinance, Sections 125-69 Z. (3)

A response to each of the criteria are listed below each standard in bold.

Z. Solar photovoltaic system, principal use (SPVS-PU). The purpose of these regulations is to allow for the construction and operation of solar photovoltaic systems, principal use (SPVS-PU), that produce energy for use on-site and/or off-site by establishing use-specific standards to ensure that the project is sited and designed to maintain aesthetic quality, visual character, and compatibility with surrounding uses. These regulations do not apply to solar photovoltaic systems accessory to a permitted use or structure.

[Added 11-2-2021]

(3) Visual impacts.

(a) The SPVS-PU shall be sited on a lot in a manner that reduces the visual impacts of the installation to the greatest extent that is practical. The Planning Board may impose design-related conditions where findings of negative impacts on sensitive resources, as listed below, are made.

Sebago recommends the Planning Board consider requiring an increase in the planting density of evergreen trees within the proposed 20' buffer area to reduce the visual impacts of the installation to the greatest extent practical.

(b) The applicant shall prepare a visual impact assessment to include a narrative and demonstration detailing the extent to which the proposed SPVS-PU would be visible from any sensitive visual resources: designated scenic resource(s); Acadia National Park; archaeological and historic resources (specifically those listed in the National Register of Historic Places, or eligible for inclusion); and the distance to the proposed SPVS-PU from the designated resources and noted viewpoints.

The submission information submitted to Sebago for review did not include a visual impact assessment or information regarding visibility from Acadia National Park (ANP), or archaeological and historic resources. Sebago has not completed an assessment of visibility from ANP. It is noted that the closest parcel of ANP appears to be 0.30 miles to the east of the project and intervening vegetation would likely screen visibility from that closest parcel.

(c) Information to be submitted shall include:

[1] A photomontage, field mockup, or other technique(s) to identify the potential visual impacts, at design capacity, of the SPVS-PU on sensitive resources and adjacent properties.

Sebago reviewed Exhibit 14 Photographs/Additional Visual Simulations which include visualizations from four viewpoints on or near adjacent residential properties listed as Viewpoint 1: Fern Meadow Drive Cul-De-Sac, Viewpoint 2: Stanley Property, Viewpoint 3: Stanley Property – Near Property Line, and Viewpoint 4: Near Bartlett Property Line.

- **Viewpoint 1: Fern Meadow Drive Cul-De-Sac** is located approximately 275 feet from the limit of clearing. The applicants' photographs were taken in leaf-off conditions and assert the remaining intervening vegetation will continue to screen the project from view. Sebago finds the simulation to reflect an accurate illustration of the minimal visual change resulting from the project during leaf-off conditions. Sebago's site visit was during leaf-on conditions. The change in vegetation will not be noticeable in leaf-on conditions.
- **Viewpoint 2: Stanley Property** is located approximately 130 feet from the limit of clearing from the back yard of the Stanley Property from near their patio. The view includes a mixture of deciduous and evergreen trees, a slack line, firepit, and two storage sheds. The proposed simulation asserts to reflect proposed conditions after clearing but without the proposed buffer planting. However, the simulation on page 4 of 15 incorrectly shows evergreen trees remaining along the edge of the limit of disturbance. Based on a 3D Model overlay and field observations, the opening created up to the limit of clearing will be more visible than the simulation implies.
- **Viewpoint 3: Stanley Property – Near Property Line** is located approximately 45 feet from the limit of clearing at the rear of the Stanley Property near the storage sheds. Based on our fieldwork observations and measurements, the proposed project will be highly visible from this location. The trees to remain on the Stanley property and within the 25' buffer range in size from 6" to 14" in diameter. However, the trees that are superimposed into the visualization appear to be approximately 24" in diameter. The evergreen saplings, shown along the limit of clearing, and the filtered screening they provide, do not exist. The visualization submitted by the applicant underestimates the degree of Project visibility from this viewpoint.

Sebago sought clarification about the approach in developing this visualization. The following response was received from the applicant:

- *TJD&A did not initially provide a methodology on the simulations as this wasn't initially required to perform the VIA where they mapped the visual impact to nearby resources in the local area. In order to respond to the concerns that Sebago raised regarding Viewpoints 2 and 3, TJD&A has provided this explanation for how they completed the work. The goal of the visualizations was to show abutters the potential overall effect of the proposed visual condition of the project. The impacts of openings in vegetation and increased light/visibility of the sky and project array were prioritized in favor of modeling the changes to individual trees.*

From TJD&A regarding Abutting Property Visualizations

- *Project visualizations were created in an effort to show the overall visual change to the landscape in an illustrative manner. Emphasis was placed on depicting a*

reduction in density of the vegetation remaining between viewpoints from abutting properties and the proposed project.

- **Project Modeling:** *A model of the project was generated in 3D Studio Max software using a representative panel model and a Digital Surface Model (DSM). GPS located photographs were collected in the field at bearings toward the project at a level horizon. The digital information (time of day, resolution, etc.) from the photographs was aligned to the 3D model.*
- **Post Production:** *Images rendered in 3D Studio Max were edited in photoshop to account for appropriate lighting and color. To illustrate the effect of vegetation removal in the midground and background, photographs from nearby woods adjacent to cleared open space were superimposed on the image. The rendered effect prioritized showing the impact of gaps forming in vegetation and light revealed through foreground branches.*

Due to the use of the superimposed photo from nearby woods instead of isolating the existing vegetation to remain, the Viewpoint 3 visualization misrepresents the proposed conditions and buffer planting plan as seen from the abutter's backyard. Sebago recommends the Planning Board consider requiring the applicant to revise Viewpoint 3 to more realistically represent the trees to be retained within the 25' buffer along the property line. A review of the images also suggests the Viewpoint 3 visualization (for Year 5 and 10) does not accurately show where the proposed buffer trees will be located or their base height.

- **Viewpoint 4: Near Bartlett Property Line is located approximately 200 feet from the limit of clearing. Based upon field observations, Sebago concurs that the Project will not be visible from this location due to intervening vegetation.**

[2] Photos showing existing site vegetation, structures, and land uses of the subject lot and abutting properties; views of the proposed SPVS-PU from sensitive visual resources and adjacent properties; and showing the topography of the subject lot and abutting properties.

The applicant provided existing conditions photographs that depict the site vegetation, structures and land uses of the abutting properties as well as the topography of the subject lot and abutting properties.

[3] Landscaping, screening, and buffering plan showing location of proposed plantings, screening, and buffering and existing vegetation to be retained.

The applicant provided Exhibit 11 Landscaping, Buffering & Screening Plan dated May 31, 2002. As noted above the plan depicts locations for deciduous and evergreen vegetation within a 20' wide x 490' long area on the southwestern Project property line adjacent to the Stanley and Murphy properties.

[4] Demonstration that the siting of the SPVS-PU has reduced the visual impact to the extent practical by methods that may include, but are not limited to, the following:

[a] Avoiding impacts to sensitive visual resources, as listed above;

The closest parcel of Acadia National Park that lists 'scenic vistas' as an attribute is located approximately 0.5 miles to the east of the project bordering Crooked Road. Sebago has not evaluated views from ANP however, the project is unlikely to be visible from this parcel.

[b] Installing the SPVS-PU in such a way as to use natural topography to obscure the project;

The Project site slopes away from the direct abutters on Fern Meadow Way and Lupine Way which would prevents the abutters from seeing the full extent of the project.

[c] Using material and colors that blend with the background; and

The photovoltaic panels will have black glazing which will minimize glare and visibility to extent practicable. The buffer vegetation will blend with the existing vegetation to remain.

[d] Retaining or planting vegetation to obscure views of the SPVS-PU.

The 25' buffer area of remaining vegetation along the southerly property line is not sufficient to screen the project adjacent to the Stanley Property due to the absence of understory growth. The applicant has proposed to supplement the remaining vegetation with a mixture of evergreen trees and multi-stemmed deciduous trees and shrubs along the Stanley and Murphy rear property lines.

The proposed 25' buffer area and remaining vegetation on the abutter's property will sufficiently screen the project from the cul-de-sac at the end of Fern Meadow Drive and from near Viewpoint 4.

Review Town of Bar Harbor Ordinance, 125-67 H. Buffering and Screening

A response to each of the criteria are listed below each standard in bold.

H. Buffering and screening. All site plans shall provide for buffering or screening in accordance with the following standards:

(1) Buffers. Buffers shall be provided and maintained:

(a) At least 75 feet in width along any line of any lot in a nonresidential district containing nonresidential structure or use if said line abuts a residential district, provided that this requirement shall not apply to the Downtown Village District;

The Project is located on Tax Map 220 Lot 67 within the Town Hill Rural District. The adjacent residential lots are also located within the Town Hill Rural District. Sebago's understanding at this time is that a 75' buffer is not required.

(b) Along property lines to shield varying uses from one another;

The applicant is proposing a 20' wide by 490' long landscape buffer along the southwest property line. Landscape buffers are not needed along any other property line.

(c) Along property lines when necessary to block prevailing winds to stop wind-borne debris from leaving the site; **N/A. The site will be revegetated after installation of solar panels.**

(d) Along interior roads running parallel to roads exterior to the site in order to prevent driver confusion, particularly at night; **N/A**

(e) Along property lines when necessary to prevent any proposed lighting from interfering with residential property or with safe driving; **N/A. The Site Plan does not indicate there will be lighting adjacent to homes on Lupine Way.**

(f) For all sites located within a two-hundred-foot corridor of Routes 3, 102 and 233 in accordance with Table 1.[2] **N/A**

(g) Along all parking areas to minimize their visual impact on adjoining traveled ways and properties. **N/A**

(2) Screening. Screening shall be provided and maintained:

(a) To block from view from adjoining traveled ways and properties all loading areas, waste collection and disposal areas, parking areas for commercial vehicles and outdoor storage areas; **N/A**

(b) Consisting of barriers sufficient to deter entry to the site where a potential safety hazard to children exists on the site. **N/A. The Project will be surrounded by a fence enclosure.**

(3) All buffers and screening shall be durable and properly maintained at all times by the owner in a neat and sanitary manner and shall be so located within the property lines to allow access for maintenance on both sides without intruding upon abutting properties.

The proposed landscape buffer will be accessible for maintenance as needed.

(4) Natural features shall be maintained wherever possible to provide a buffer between the proposed development and noncompatible abutting properties and public roadways. When natural features such as topography, gullies, stands of trees, shrubbery or rock outcrops do not exist or are insufficient to provide a buffer, other kinds of buffers shall be provided to satisfy the purposes stated above. Evergreens can be used as buffers, provided they are planted properly. An evergreen buffer requires two or three rows of staggered plantings. The rows should be five feet apart and the evergreens planted four feet on center. All plantings required under this chapter shall be of a type and species appropriate for the soil types and climatic conditions in Bar Harbor.

The applicant intends to preserve 25' of vegetation and add a mixture of deciduous and evergreen trees within a 20' wide by 490' long planted buffer. To be compliant with this

standard, Sebago recommends the Planning Board require a minimum of two rows of staggered evergreen trees.

(5) Unless otherwise specifically indicated by the Planning Board, all plant materials used in any buffer or screening required under this chapter shall meet the following minimum size standards:

Plant Type	If Site Abuts Vacant Land	All Other Sites
Canopy tree		
Single stem	1.5 inch caliper	2.5 inch caliper
Multiple stem	6 feet high	10 feet high
Understory tree	4 feet high	1.5 inch caliper
Evergreen tree	3 feet high	5 to 7 feet high
Shrub		
Deciduous	15 inches high	24 inches high
Evergreen	12 inches high	18 inches high

Because the buffer plantings do not abut vacant land, they are required to meet the standard for All Other Sites noted above. The plant material sizes specified on the Buffer Planting Plan dated May 31, 2022, meet the standard for Witch hazel (5-7'), Norway Spruce (5-7' min), and White Spruce (5-7' min) . The size specification for Striped Maple (6-8') and Hawthorne (6-8', 1.25" cal) are undersized for a multi-stemmed canopy tree or understory tree. Sebago recommends the Planning Board consider requiring larger plant material size for the area of the buffer directly adjacent to the Stanley Property at a minimum.

Please contact us if additional information is needed prior to the Staff/ Planning Board in July.

Sincerely,

SEBAGO TECHNICS, INC.



Amy Bell Segal, RLA ASLA
Maine Licensed Landscape Architect
Senior Project Manager