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**Beth S. Greenblatt**  
*Managing Director*

February 8, 2021

Town of Northfield  
Mr. Stephen Serebinski, Chair  
Northfield Planning Board  
69 Main Street  
Northfield, MA 01360

*RE: Special Permit for Pine Meadow Road Solar Array "A", Assessor Map 54, Lot B7 and Map 53, Lot E1*

Dear Chairman Serebinski :

Beacon Integrated Solutions ("Beacon") was engaged by the Town of Northfield, Planning Board to review the Application filed by BWC Pine Meadow Brook, LLC for three Large-Scale Ground-Mounted Solar Photovoltaic Systems and to report on our findings with respect to the Applicant's compliance with the Northfield Solar Generation Zoning By-Law. The findings presented herein pertain to Pine Meadow Road Solar Array A.

**Background:**

On December 28, 2020, BWC Pine Meadow Brook, LLC, a Delaware special purpose entity and wholly-owned limited liability company of BlueWave Project Development LLC, with a legal business address located at 111 Huntington Avenue, Suite 650, Boston, MA 02199 ("Applicant"), through its Consulting Engineer, Field Engineering Co., Inc., filed an application to construct a utility-scale solar facility on Pine Meadow Road in Northfield under the Town of Northfield Zoning By-laws for a Special Permit pursuant to Section 3.4, a Site Plan Review pursuant to Section 3.5 and in accordance with the Solar Generation Zoning By-law, Section 11.08.

The Applicant is proposing to construct, own, operate and maintain a ground-mounted dual-use, single axis tracker solar photovoltaic array ("Pine Meadow Road Array A", herein after referred to as "Array A"), sized at 6 megawatt (MW) DC/3-megawatts (MW) AC, paired with 3 megawatts (MW) of DC-coupled energy storage, plus appurtenant equipment on approximately 41.3 acres of cleared agricultural land located across two parcels comprised of a total area of approximately 53.2 acres on Pine Meadow Road, Northfield MA.

The Parcel ID numbers are Assessor Map 54, Lot B7 and Map 53, Lot E1. Array A will be maintained in agricultural use, supporting light livestock for grazing, specifically Dorpers and/or Katahdins Feeder Lambs. Array A will be accessed via a newly constructed gravel access drive off of Pine Meadow Road and will be completely enclosed by an 8-foot woven-wire agricultural fence.

Beacon's findings are presented herein.

GENERAL INFORMATION AND OVERVIEW		
<b>Parcel Identification</b>	<b>Assessor Maps</b>	Map 54, Lot B7 – Book 6981, Page 97 Map 53, Lot E1 – Book 6479, Page 201
<b>Array A Details</b>		6 MW DC/3 MW AC 3 MW of DC-coupled energy storage (lithium-ion batteries) Approximately 14,456 solar modules, mounted on pile-driven single axis trackers
<b>Applicant Parties</b>	<b>Property Owner</b>	Hopping Ahead LLC and Bonnie Tucker L’Etoile and Eugene L’Etoile 496 Pine Meadow Road, Northfield, MA 01360 MA Limited Liability Company, Organized on November 15, 2013 and individual owners respectively
	<b>Array A Owner</b>	BWC Pine Meadow Brook LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 DE Limited Liability Company, Organized on January 4, 2019 MA Foreign Limited Liability Company, Registered on March 30, 2020
	<b>Array A Owner Parent Company</b>	BlueWave Project Development LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 DE Limited Liability Company, Organized on January 30, 2012 MA Foreign Limited Liability Company, Registered on January 31, 2012
	<b>Long-term Array A Owner/Operator</b>	TBD. BlueWave Project Development LLC intends to sell BWC Pine Meadow Brook LLC
	<b>Consulting Engineer</b>	Field Engineering Co., Inc Richard R. Riccio III, P.E., License #45898 11D Industrial Drive, P.O. Box 1178, Mattapoisett, MA 02739
	<b>Project Surveyor</b>	DGT Associates Surveying & Engineering 255 Park Avenue, Suite 500, Worcester, MA 01609
	<b>Proposed Farmer</b>	Finicky Farm TBD
	<b>Asset Manager</b>	TBD-Responsible for operations, annual O&M, reporting and farming
<b>Property Restrictions</b>	<b>M.G.L. c. 61A</b>	Pursuant to Section 2A, Array A would no longer qualify under Chapter 61A protections and pursuant to Section 13 <u>will be</u> subject to roll-back taxes to the Town. Applicant has indicated that it will remove the parcels from M.G.L. c. 61A prior to construction commencement.
	<b>Agricultural Covenant</b>	Array A will be constructed on land restricted by an Agricultural Covenant under the Farm Viability Enhancement Program. Applicant has provided documentation that pursuant to M.G.L., c. 224 of the Acts of 2018 ( <i>An Act Releasing Certain Land in Northfield From the Operation of an Agricultural</i>

		<i>Covenant</i> ), the Agricultural Covenant has been released. As it is expected that the Applicant will conduct a Title search in connection with executing a Lease agreement, Beacon recommends that in connection with its application for a Building Permit, the Planning Board should require the Applicant to provide proof of release of the parcels under review in this application.
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ZONING BY-LAW REFERENCE	ZONING BY-LAW SECTION	BEACON FINDINGS
11.08.03.01	Compliance with Laws, Ordinances and Regulations	The Applicant addressed the specific requirements of the Town of Northfield Zoning By-Laws, Sections 3.4C, 3.5, 10.3 and 11, and have asserted that it will comply with all laws, ordinances and regulations.
11.08.03.02	Building Permit	<p>The Applicant has indicated that it will file all required State and Local permits.</p> <p>The Applicant provided Proposed Site Drawings, prepared by Field Engineering Co., Inc., Consulting Engineers and stamped by Richard R. Riccio III, a licensed MA Professional Engineer.</p> <p>Beacon notes that the Proposed Site Drawings is for Special Permit use only and is not construction level design documents. Beacon recommends that the Applicant provide final construction drawings to the Planning Board, stamped by a licensed professional engineer register in MA prior to seeking a Building Permit.</p>
11.08.03.03	Fees	The Applicant claims to have made all required payments for filing fees for the Special Permit and Site Plan Review. Payment for Building Permit Fees will be required in connection with the filing of the Building Permit application.
11.08.03.04	Site Plan Review (1) General	<p>The Applicant has provided full-scale Proposed Site Drawings, dated 12/28/2020, stamped and signed by a Professional Civil Engineer licensed in Massachusetts. Site Drawings include:</p> <ul style="list-style-type: none"> <li>• Overall Assemblage Plan SL-1</li> <li>• Existing Conditions Plan EC-1</li> <li>• Site Plan SP-1 and SP-2</li> <li>• Sedimentation &amp; Erosion Control SEC-1 and SEC-2 (labeled as a SEC-1)</li> <li>• Site Details DET-1</li> <li>• Notes and Legend N-1</li> </ul> <p>Site Drawings are for Permitting and <u>are not</u> Construction Drawings</p>

<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(a). Site Plan showing:</u> <i>i. Property lines and physical features;</i></p>	<p>The Applicant has provided a Site Plan detailing all Property lines and physical features including roadways. Site Drawings dated 12/28/2020, pages SL-1.</p>
	<p><i>ii. Proposed changes to the landscape;</i></p>	<p>The Applicant claims that existing conditions of the two parcels consist mainly of farmed field areas with peripheral wooded areas along the easterly side of the parcels and on portions of the western side adjacent to Pine Meadow Road. Further, Applicant claims that the parcels consist of some bordering vegetated wetland areas on the eastern side of the parcels.</p> <p>The Applicant claims construction will not require any significant clearing of vegetation within the footprint of Array A, and Array A will follow the contours of the land with minimal site grading required. In areas targeted for livestock grazing, disturbed areas will be hydroseeded with a conservation/wildlife mix for erosion control and to establish a managed pasture.</p> <p>The Applicant will construct an 18-foot-wide permanent gravel access road at the western part of Array A, running generally parallel to Pine Meadow Road. The gravel access road will run north/south. A 40-foot by 70-foot concrete equipment pad will be constructed on parcel Map 53, Lot E1. The concrete equipment pad will house, among others, the inverters, switchgear, transformer, metering equipment, battery storage and HVAC equipment. Array A will support four (4) 20-foot-wide access gates to provide operational and emergency access to Array A. Knox Boxes (or other option approved by the Town’s Public Safety officials) will enable emergency access to each gate.</p> <p>Three Hoop Houses will be constructed on parcel Map 54, Lot B7 for use in agricultural operations. An irrigation well for agricultural operations and livestock hydration will be constructed adjacent to the Hoop Houses. Details on the construction, physical size, utilities requirement or use/operation of the Hoop Houses have not been provided. Further, information as to whether Array A, the property owner or the Asset Manager will own, operate and maintain the Hoop Houses. Beacon recommends that the Planning Board require additional information on the design, use and operation of the Hoop Houses.</p>

		<p>Point of Interconnection of Array A to Eversource will be on Pine Meadow Road. An underground conduit will be installed from the concrete equipment pad under the gravel access road, through a heavily wooded and sloped topography to Pine Meadow Road. It is expected that 4 new utility poles will be required on Pine Meadow Road. The pole line will include a riser pole owned by Array A, plus 3 additional new poles owned by Eversource. Each pole is expected to be spaced approximately 50 feet apart. Wiring from pole to pole will be above ground.</p> <p>The Applicant proposed to enclose Array A entirely with an 8-foot wire-woven agricultural fence. Isolated vegetative screening has been proposed at the main entrance to Array A and parallel to Pine Meadow Road in the north-western portion of parcel Map 53, Lot E1. The proposed vegetative screening includes 7 to 8-foot eastern red cedar junipers (<i>Juniperus Virginiana</i>). No further vegetative screening for Array A has been proposed as it is anticipated that the setbacks provide sufficient open-area buffer from Pine Meadow Road and neighboring abutters.</p> <p>While the Applicant indicated lighting systems will not be required for Array A, Beacon notes that the battery storage system will be contained in a Conex box which will likely have interior lights to facilitate maintenance activities. These lights will not be in constant use.</p>
	<p><i>iii. Locations of wetlands and Priority Habitat Areas;</i></p>	<p>As shown in Site Drawings dated 12/28/2020, pages SP-1 and SP-2, Array A is bordered to the east with vegetated wetlands. Beacon notes that the Applicant’s proposed Site Plan locates Array A’s fence within the 100-foot wetland buffer and within the 100-foot property setback. It is expected that the Applicant will address this issue in the Notice of Intent filing with the Northfield Conservation Commission.</p> <p>The Applicant claims that no portion of Array A is located within any mapped habitat according to the latest Natural Heritage and Endangered Species Program (NHESP). Beacon recommends that the Applicant file a Notice of Intent with NHESP to confirm the non-existence of native species listed as endangered, threatened or of special concern.</p>
	<p><i>iv. Locations of Floodplains;</i></p>	<p>As shown in Site Drawings dated 12/28/2020, pages SP-1 and SP-2, no portion of the parcels fall within FEMA Flood Zones.</p>
	<p><i>v. Locations of Priority Heritage landscapes/ National Historic districts;</i></p>	<p>The Applicant did not address whether Array A is located within Priority Heritage landscapes or local or National Historic districts. Beacon notes that the parcels subject to this application are zoned Residential-Agricultural.</p>

	<p><i>vi. List of hazardous materials;</i></p>	<p>The Applicant claims that the only potential hazardous materials exist in the equipment located on the concrete equipment pad. Fluids contained in inverters, transformers, HVAC equipment and lithium-ion batteries are considered hazardous if released. The Applicant suggests that since these fluids are stored in self-contained vessels, risk for release is minimal. Beacon recommends that the Applicant provide detailed operations, maintenance and remedial procedures to address issues pertaining to fluid release and impact on vegetation and stormwater.</p> <p>Further, Beacon recommends that the Applicant provide more detailed information on the proposed battery storage and containment equipment, in addition to the HVAC equipment. Specifically, the Applicant should provide documentation on the fluids contained in these systems in addition to the fire suppression systems to be used.</p> <p>While the Applicant claims that since Array A will be remotely monitored, any mechanical failures would be detected timely. Beacon assumes the referenced remote monitoring is provided by Array A’s Data Acquisition System which provides near real-time electric generation information as to system performance.</p>
	<p><i>vii. Blueprints or drawings signed by Professional Engineer licensed in MA;</i></p>	<p>Applicant has provided full-scale Proposed Site Drawings, dated 12/28/2020, stamped and signed by a Professional Civil Engineer licensed in Massachusetts. Site Drawings include:</p> <ul style="list-style-type: none"> <li>• Overall Assemblage Plan SL-1</li> <li>• Existing Conditions Plan EC-1</li> <li>• Site Plan SP-1 and SP-2</li> <li>• Sedimentation &amp; Erosion Control SEC-1 and SEC-2 (labeled as a SEC-1)</li> <li>• Site Details DET-1</li> <li>• Notes and Legend N-1</li> </ul> <p>Site Drawings are for Permitting are not Construction Drawings. Shading from nearby trees in the eastern and north-western portions of the parcel have been delineated and are not anticipated by the Applicant to be a concern. Beacon recommends that the Applicant provide additional detail as to its approach to running underground conduit through the wooded and sloped topography to Pine Meadow Road for the utility interconnection. Such detail should include the impact on existing trees and vegetation.</p>
	<p><i>viii. Electrical diagram;</i></p>	<p>The Applicant provided a copy of the Preliminary Single Line Drawing filed with Eversource on 1/29/2019 in connection with its application for interconnection of distributed generation. The Single Line Drawing, and the application supports a larger project and has since been re-configured</p>

		<p>and sized. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.</p> <p>Beacon recommends that the Applicant provide additional detail as to its approach to locating underground conduit through the wooded and sloped topography to Pine Meadow Road for the utility interconnection. Such detail should include the impact on existing trees and vegetation.</p>
	<i>ix. Documentation of the major system components;</i>	<p>The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. The application requires documentation of all major system components, including, but not limited to, among others, inverters, modules, switchgear, transformers, relays and energy storage systems. Cutsheet documentation provided in connection with the Special Permit/Site Plan Approval applications differs from stated equipment specified to Eversource. Further, documentation of all major equipment anticipated was not provided, and has been requested. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.</p>
	<i>x. Name, address and contact information of the installer;</i>	<p>The Applicant claims that it will competitively bid Engineering, Procurement and Construction (EPC) services prior to commencement of construction. Beacon recommends that the Applicant identify and provide all required information to the Planning Board in connection with its application for a Building Permit.</p>
	<i>xi. Name, address and contact information of the project proponent or property owner;</i>	<p>The Applicant has provided all required identification and contact information on the property owner, along with a letter from the property owner to the Northfield community endorsing the project. Beacon has a copy of the application for Site Plan Approval and therefore does not have a signed document, but assumes the original documents contain the required signatures.</p>
	<i>xii. Name, contact information and signature of any agents representing project proponent.</i>	<p>The Applicant has provided all of the required identification and contact information.</p>
<b>11.08.03.04</b>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(b). Site Control</u></p>	<p>The Applicant has provided a copy of the original site Option Agreement between the property owner and Applicant executed on 12/21/2018, which provides the Applicant with an irrevocable and exclusive Option to lease the property. Under the Option Agreement, the Land Lease Agreement has an initial term of 20-years, with an option to extend the Lease term for up to three 5-year extensions, for a total of up to 35 years.</p>

		<p>A search of the Franklin County Registry of Deeds revealed that on 12/18/2020, the Applicant and property owner executed an Amended and Restated Notice of Option Agreement extending the Option period for 36 months.</p> <p>Array A is contemplated to be constructed as a dual-use solar facility. As such, Array A will be constructed to allow for continued use of the property for agricultural purposes. Under the terms of the Lease Agreement, the property owner has primary responsibility to serve as the active farmer. If the property owner is unable to fulfill that obligation, the Applicant will collaborate with the property owner to facilitate the on-going agricultural use of the property.</p> <p>Beacon recommends that the Planning Board Condition the Special Permit by requiring continued agricultural use, and providing annual documentation demonstrating that the Applicant has utilized agricultural best practices along with a copy of the Annual Reports filed with the Massachusetts Department of Agriculture and Massachusetts Department of Energy Resources as required under the Commonwealth’s SMART Program.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(c). Operation &amp; Maintenance Plan</u></p>	<p>The Applicant provided an Operations and Maintenance (O&amp;M) Plan addressing O&amp;M during construction, post construction and with respect to post construction Stormwater Management Systems.</p> <p>To ensure adequate access for Public Safety vehicles to Array A, Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Applicant provide year-round access to the concrete equipment pad and the overall system, including providing the Town on an annual basis with adequate documentation addressing snow removal services on the gravel access road.</p> <p>Beacon further recommends that in connection with its jurisdictional review of the Notice of Intent to be filed with the Northfield Conservation Commission, a review of the proposed annual O&amp;M Stormwater Management Systems plan should be evaluated for best management practices.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(d). Utility Notification</u></p>	<p>The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.</p>



<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(e). Zoning District Designation</u></p>	<p>As required under the Zoning By-Law, the Applicant provided a copy of the Town’s Zoning Map and identified the location of the proposed project. Beacon notes that the project is sited in the Residential-Agricultural Zone.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(f). Proof of Liability Insurance</u></p>	<p>The Applicant provided a sample Certificate of Insurance providing proof of Liability Insurance as required in the Zoning By-Law. Beacon recommends that the Planning Board seek guidance from the Town’s insurance agent with regard to the limits of coverage. Specifically, the Applicant’s Commercial General Liability coverage limits may be inadequate for a project of this size. Excess/Umbrella Liability coverage in an amount of not less than \$3 to \$5 million is common for a project of this size. Further, proof of Automobile liability coverage and Workers Compensation and Employers’ Liability coverage should be provided. The Town of Northfield, along with the property owner should be named as a Certificate Holder.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(g). Financial Surety</u></p>	<p>The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc.</p> <p>The Decommissioning Plan includes labor and equipment costs for the removal of Array A and the restoration necessary, excluding normal wear and tear. Further, the cost estimate includes an approximate 2.45 percent annual increase to account for inflation.</p> <p>Beacon notes that given the size of Array A, the estimated total cost in 2020 dollars likely understates the magnitude of the effort by a factor of 2. Beacon recommends that the Planning Board request the Applicant to reconsider its projected cost estimate and provide supporting documentation of actual decommissioning costs for projects owned by the Applicant of similar size.</p> <p>Beacon recommends that the form of Financial Surety be an annual renewing irrevocable Bond with the Town of Northfield as the named bond holder.</p>

<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(3) Setback and Height Requirements</b></p>	<p>As required under the Zoning By-Law, setback requirements for all large-scale ground-mounted solar photovoltaic installations, including appurtenant structures and parking areas are at least 100-feet from any property boundary.</p> <p>As shown in Site Drawings dated 12/28/2020, pages SP-1 and SP-2,</p> <ul style="list-style-type: none"> <li>• the majority of the 18-foot-wide gravel access road and security fencing on the north-western and western portions of the parcels are sited <u>within</u> the 100-foot setback restriction;</li> <li>• the majority of the 18-foot-wide gravel access road and security fencing on portions of the southern portion of the parcel are sited <u>within</u> the 100-foot setback restriction; and</li> <li>• three of the four 20-foot-wide access gates are located on/near 100-foot setback line with the fourth located <u>within</u> the 100-foot setback restriction.</li> </ul> <p>The Applicant claims that no structure will exceed the 20-foot height limitation of the Zoning By-Law. Beacon notes that while the maximum height of the top of the module when in full tracking position is expected to be 13-feet at the highest point, the Applicant should confirm its continued compliance in its submission for a Building Permit. Further, no information has been provided by the Applicant with respect to the height of the major equipment and containers to be sited on the concrete equipment pad.</p> <p>Further, three Hoop Houses will be constructed on parcel Map 54, Lot B7 for use in agricultural operations. Details on the construction, physical size, utilities requirement or use/operation of the Hoop Houses have not been provided.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(4) Appurtenant Structures</b></p>	<p>The Applicant claims that the design of the appurtenant structures of Array A has been prepared to be compatible and consistent with commonly used structures for the industry, that the concrete equipment pad is setback from the road and/or screened with vegetation.</p> <p>As noted above, three Hoop Houses will be constructed on parcel Map 54, Lot B7 for use in agricultural operations. Details on the construction, physical size, utilities requirement or use/operation of the Hoop Houses have not been provided. Beacon recommends that the Planning Board require additional information on the design, use and operation of the Hoop Houses.</p>

		<p>Beacon notes that the concrete equipment pad, and associated equipment are located in the western portion of the parcel, in parallel to Pine Meadow Road. While the concrete equipment pad and gravel access road are at a higher elevation and bordered by a heavy tree line, Beacon recommends that the Planning Board condition the Special Permit to require the Applicant to conduct a “balloon test” from the highest point expected of the equipment on the concrete pad at a time when any deciduous trees have lost its leaves.</p> <p>Beacon recommends that this review further consider any visual impacts associated with the utility interconnection, particularly as it relates to any tree removal requirements in connection with siting the underground conduit run from the concrete equipment pad to Pine Meadow Road.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b>  <b>(5) Design and Performance Standards</b>  <u>(b). Lighting</u></p>	<p>While the Applicant indicated lighting systems will not be required for Array A, Beacon notes that the battery storage system will be contained in a Conex box which will likely have interior lights to facilitate maintenance activities. These lights will not be in constant use.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b>  <b>(5) Design and Performance Standards</b>  <u>(c). Signage</u></p>	<p>As shown in Site Drawings dated 12/28/2020, page DET-1, the Applicant has provided a mock-up of a sample Site Identification sign. While the content of the sign provides contact information in the event of an emergency, Beacon recommends that the Applicant or its Asset Manager/Operator provide a number that is available 24/7/365 to address emergency concerns. This is particularly important for Public Safety personnel.</p> <p>The Applicant has also indicated that signage will be installed as required for safety under state and local requirements and the National Electrical Code. These signs are expected to be attached to the 8-foot woven-wire agricultural fence and on appropriate equipment located on the concrete equipment pad.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b>  <b>(5) Design and Performance Standards</b>  <u>(d). Utility Connections</u></p>	<p>The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. Beacon understands that the interconnection process is an iterative process and we have requested updated documentation on 2/2/2021.</p> <p>All major equipment, including but not limited to inverters, switchgear, transformers, relays and energy storage systems will be located on the 40-foot by 700-foot concrete equipment pad.</p> <p>As shown in Site Drawings dated 12/28/2020, page SP-1, the Point of Interconnection of Array A to Eversource will be on Pine Meadow Road. An underground conduit will be installed from the concrete equipment pad under the gravel access road, through a heavily wooded and sloped</p>

		<p>topography to Pine Meadow Road. It is expected that 4 new utility poles will be required on Pine Meadow Road. The pole line will include a riser pole owned by Array A, plus 3 additional new poles owned by Eversource. Each pole is expected to be spaced approximately 50 feet apart. Wiring from pole to pole will be above ground.</p> <p>The Applicant has not addressed how it will combine all electrical connections throughout Array A.</p>
11.08.03.04	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(e). Roads</u></p>	<p>The Applicant claims to have designed the 18-foot-wide permanent gravel access road to minimize grading by following the existing property grade. The gravel access road will be outside of the fence line and will not be gated. Instead, the Applicant has proposed four 20-foot gates located within the fence line along the western portion of Array A. The four proposed gates provide operational and emergency access to short feeder access driveways which also appear to be 20-foot wide. Knox Boxes (or other option approved by the Town’s Public Safety officials) will enable emergency access to each gate.</p>
11.08.03.04	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(f). Control of Vegetation</u></p>	<p>The Applicant claims, and has supported in the O&amp;M documentation, that the use of any chemicals, herbicides or pesticides within Array A will be prohibited.</p> <p>Beacon recommends that the Planning Board Condition the Special Permit by prohibiting the use of any chemicals, herbicides or pesticides within Array A and in all portions of the parcels under the Applicant’s control.</p>
11.08.03.04	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(g). Hazardous Materials</u></p>	<p>The Applicant claims that the only potential hazardous materials exist in the equipment located on the concrete equipment pad. Fluids contained in inverters, transformers, HVAC equipment and lithium-ion batteries are considered hazardous if released. The Applicant suggests that since these fluids are stored in self-contained vessels, risk for release is minimal. Beacon recommends that the Applicant provide detailed operations, maintenance and remedial procedures to address issues pertaining to fluid release and impact on vegetation and stormwater.</p> <p>Further, Beacon recommends that the Applicant provide more detailed information on the proposed battery storage and containment equipment, in addition to the HVAC equipment. Specifically, the Applicant should provide documentation on the fluids contained in these systems in addition to the fire suppression systems to be used.</p> <p>While the Applicant claims that since Array A will be remotely monitored, any mechanical failures would be detected timely. Beacon assumes the remote monitoring is provided by the Data</p>

		Acquisition System which provides near real-time electric generation information as to system performance.
11.08.03.04	<p><b>Site Plan Review</b></p> <p><b>(5) Design and Performance Standards</b></p> <p><u>(h). Noise</u></p>	<p>The Zoning By-Law limits sound or noise levels to not greater than 50 dBA at the boundary of the property.</p> <p>The Applicant indicated that the only noise associated with Array A originates from the transformers and inverters, which have been strategically located such that the audible radius from the concrete equipment pad results on no audible impact to the boundaries of the property. Beacon notes that the battery storage facilities will be climate controlled by on-site HVAC equipment.</p> <p>Beacon recommends that the Planning Board require the Applicant to provide a noise study of the combined solar photovoltaic array equipment and associated battery storage system demonstrating dBA levels at the boundary of the property.</p>
11.08.03.04	<p><b>Site Plan Review</b></p> <p><b>(6) Safety and Environmental Standards</b></p> <p><u>(a). Emergency Services</u></p>	<p>The Applicant indicated that prior to making application for a Building Permit, the selected Installer will provide Public Safety officials with a project summary, a full complement of construction drawings and electrical plans. Further, prior to commissioning Array A, the selected Installer will provide training to Public Safety personnel on the operations, maintenance and de-energizing Array A.</p> <p>Beacon recommends that prior to commissioning, the Applicant should provide the Town with a Safety Manual describing the components of Array A and detailing safe de-energizing procedures of all major components including inverters, battery systems and modules. While it is not expected such detailed de-energizing procedures will be required, such information would prove beneficial in the event of a significant emergency.</p> <p>The main entrance to Array A is proposed by Applicant at the north-western portion of Array A. The main entrance will not be gated and will provide full access to the north-south gravel access road. As noted above, the gravel access road will be outside of the fence line.</p> <p>The Applicant has proposed four 20-foot gates located within the fence line along the western portion of Array A. The four proposed gates provide operational and emergency access to short feeder access driveways which also appear to be 20-feet wide. Knox Boxes (or other option approved by the Town’s Public Safety officials) will enable emergency access to each gate.</p>

		<p>Beacon notes that BlueWave Project Development LLC intends to sell BWC Pine Meadow Brook LLC. Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Town be noticed on any assignment, transfer or sale of BWC Pine Meadow Brook LLC.</p>
11.08.03.04	<p><b>Site Plan Review</b></p> <p><b>(6) Safety and Environmental Standards</b></p> <p><u>(b). Land Clearing, Soil Erosion and Habitat Impacts</u></p>	<p>The Applicant claims that there is minimal clearing of any natural vegetation as shown in the Site Drawings dated 12/28/2020, pages EC-1, SP-1 and SP-2.</p> <p>Further, the Applicant claims that soil excavation and site grading requirements are also minimal. The selected Installer will be required to comply with all soil and stormwater requirements set forth in the Stormwater Pollution Prevention Plan under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, and by the Northfield Conservation Commission.</p>
11.08.04.01	<p><b>Monitoring, Maintenance and Reporting – Solar Photovoltaic Installation Conditions</b></p>	<p>The Applicant provided an Operations and Maintenance (O&amp;M) Plan addressing O&amp;M during construction, post construction and with respect to Stormwater Management Systems.</p> <p>To ensure adequate access for Public Safety vehicles to Array A, Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Applicant provide year-round access to the entire gravel access road, concrete equipment pad and the overall system, including providing the Town on an annual basis with adequate documentation demonstrating the provision for snow removal services on the gravel access road.</p> <p>Beacon further recommends that in connection with its jurisdictional review of the Notice of Intent to be filed with the Northfield Conservation Commission, a review of the proposed annual O&amp;M Stormwater Management Systems plan should be evaluated for best management practices.</p> <p>Further, prior to commissioning Array A, the selected Installer will provide training to Public Safety personnel on the operations, maintenance and de-energizing Array A.</p>
11.08.04.02	<p><b>Monitoring, Maintenance and Reporting – Modifications</b></p>	<p>Beacon recommends that the Planning Board Condition the Special Permit to require that any material modifications to Array A, specifically as it relates to Array A DC capacity, battery storage, changes to the size or location of the concrete equipment pad, and/or changes to the design of the utility interconnection as shown in the Site Drawings dated 12/28/2020, pages SP-1 and SP-2, among others, be immediately provided to the Planning Board for approval.</p>

<p><b>11.08.04.03</b></p>	<p><b>Monitoring, Maintenance and Reporting – Annual Reporting</b></p>	<p>In addition to the reporting requirements set forth in the Zoning By-Law, Beacon recommends that the Planning Board require the Applicant to provide copies of any annual reports filed with the Massachusetts Department of Agriculture and Massachusetts Department of Energy Resources in compliance with SMART Program qualifications. Such annual reporting shall include, but not be limited to the productivity of the crop(s) and herd, including pounds harvested and/or grazed, herd size growth, success of the crop if applicable, and potential changes.</p>
<p><b>11.08.05.01</b></p>	<p><b>Abandonment or Decommissioning – Removal Requirements</b> (1) Physical removal (2) Disposal of waste (3) Stabilization or re-vegetation</p>	<p>The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc. The Decommissioning Plan included a scope of work, and labor and equipment cost for the removal of Array A and the restoration of the parcels to the original condition, excluding normal wear and tear.</p>
<p><b>11.08.05.02</b></p>	<p><b>Abandonment or Decommissioning – Abandonment</b></p>	<p>In addition to the requirements and obligations set forth in the Zoning By-Law, Beacon recommends that the Planning Board require the Applicant and property owner to address Decommissioning Requirements in its Lease agreements and provide evidence of such obligations.</p>
<p><b>11.08.06</b></p>	<p><b>Financial Surety</b></p>	<p>The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc. The Decommissioning Plan includes a scope of work and labor and equipment costs for the removal of Array A and the restoration of the parcels to the original condition, excluding normal wear and tear. The cost estimate includes an approximate 2.45 percent annual increase to account for inflation.</p> <p>Beacon notes that given the size of Array A, the estimated total cost in 2020 dollars likely understates the magnitude of the effort by a factor of 2. Beacon recommends that the Planning Board request the Applicant to reconsider its projected cost estimate and provide supporting documentation of actual decommissioning costs for projects owned by the Applicant of similar size.</p> <p>Beacon recommends that the form of Financial Surety be an annual renewing irrevocable Bond with the Town of Northfield as the named bond holder.</p>

Beacon very much appreciates the opportunity to support the Northfield Planning Board in its review of these Large-Scale Ground-Mounted Solar Photovoltaic systems. If you have any questions or need additional information, please do not hesitate to contact me directly at 617-469-2172.

Best regards,

*Beth S. Greenblatt*

Beth S. Greenblatt





**Beth S. Greenblatt**  
*Managing Director*

February 8, 2021

Town of Northfield  
Mr. Stephen Serebinski, Chair  
Northfield Planning Board  
69 Main Street  
Northfield, MA 01360

*RE: Special Permit for Pine Meadow Road Solar Array "B", Assessor Map 54, Lot B5 and Map 55, Lot B1*

Dear Chairman Serebinski :

Beacon Integrated Solutions ("Beacon") was engaged by the Town of Northfield, Planning Board to review the Application filed by BWC Pine Meadow Brook, LLC for three Large-Scale Ground-Mounted Solar Photovoltaic Systems and to report on our findings with respect to the Applicant's compliance with the Northfield Solar Generation Zoning By-Law. The findings presented herein pertain to Pine Meadow Road Solar Array B.

**Background:**

On December 28, 2020, BWC Pine Meadow Brook, LLC, a Delaware special purpose entity and wholly-owned limited liability company of BlueWave Project Development LLC, with a legal business address located at 111 Huntington Avenue, Suite 650, Boston, MA 02199 ("Applicant"), through its Consulting Engineer, Field Engineering Co., Inc., filed an application to construct a utility-scale solar facility on Pine Meadow Road in Northfield under the Town of Northfield Zoning By-laws for a Special Permit pursuant to Section 3.4, a Site Plan Review pursuant to Section 3.5 and in accordance with the Solar Generation Zoning By-law, Section 11.08.

The Applicant is proposing to construct, own, operate and maintain a ground-mounted dual-use, single axis tracker solar photovoltaic array ("Pine Meadow Road Array B", herein after referred to as "Array B"), sized at 4.3- megawatts (MW) DC/2-megawatts (MW) AC, paired with 2 megawatts (MW) of DC-coupled energy storage, plus appurtenant equipment on approximately 26.1 acres of cleared agricultural land located across two parcels comprised of a total area of approximately 80.1 acres on Pine Meadow Road, Northfield MA.

The Parcel ID numbers are Assessor Map 54, Lot B5 and Map 55, Lot B1. Array B will be maintained in agricultural use, supporting light livestock for grazing, specifically Dorpers and/or Katahdins Feeder Lambs. Array B will be accessed via a newly constructed gravel access drive off of Pine Meadow Road and will be completely enclosed by an 8-foot woven-wire agricultural fence.

Beacon's findings are presented herein.

GENERAL INFORMATION AND OVERVIEW		
<b>Parcel Identification</b>	<b>Assessor Maps</b>	Map 54, Lot B5 – Book 6479, Page 201 Map 55, Lot B1 – Book 6479, Page 201
<b>Array B Details</b>		4.3 MW DC/2 MW AC 2 MW of DC-coupled energy storage (lithium-ion batteries) Approximately 10,200 solar modules, mounted on pile-driven single axis trackers
<b>Applicant Parties</b>	<b>Property Owner</b>	Hopping Ahead LLC 496 Pine Meadow Road, Northfield, MA 01360 MA Limited Liability Company, Organized on November 15, 2013
	<b>Array B Owner</b>	BWC Pine Meadow Brook LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 DE Limited Liability Company, Organized on January 4, 2019 MA Foreign Limited Liability Company, Registered on March 30, 2020
	<b>Array B Owner Parent Company</b>	BlueWave Project Development LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 DE Limited Liability Company, Organized on January 30, 2012 MA Foreign Limited Liability Company, Registered on January 31, 2012
	<b>Long-term Array B Owner/Operator</b>	TBD. BlueWave Project Development LLC intends to sell BWC Pine Meadow Brook LLC
	<b>Consulting Engineer</b>	Field Engineering Co., Inc Richard R. Riccio III, P.E., License #45898 11D Industrial Drive, P.O. Box 1178, Mattapoisett, MA 02739
	<b>Project Surveyor</b>	DGT Associates Surveying & Engineering 255 Park Avenue, Suite 500, Worcester, MA 01609
	<b>Proposed Farmer</b>	Finicky Farm TBD
	<b>Asset Manager</b>	TBD-Responsible for operations, annual O&M, reporting and farming
<b>Property Restrictions</b>	<b>M.G.L. c. 61A</b>	Pursuant to Section 2A, Array B would no longer qualify under Chapter 61A protections and pursuant to Section 13 <u>will be</u> subject to roll-back taxes to the Town. Applicant has indicated that it will remove the parcels from M.G.L. c. 61A prior to construction commencement.
	<b>Agricultural Covenant</b>	Array B will be constructed on land restricted by an Agricultural Covenant under the Farm Viability Enhancement Program. Applicant has provided documentation that pursuant to M.G.L., c. 224 of the Acts of 2018 ( <i>An Act Releasing Certain Land in Northfield From the Operation of an Agricultural Covenant</i> ), the Agricultural Covenant has been released. As it is expected that the Applicant will

		conduct a Title search in connection with executing a Lease agreement, Beacon recommends that in connection with its application for a Building Permit, the Planning Board should require the Applicant to provide proof of release of the parcels under review in this application.
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ZONING BY-LAW REFERENCE	ZONING BY-LAW SECTION	BEACON FINDINGS
11.08.03.01	Compliance with Laws, Ordinances and Regulations	The Applicant addressed the specific requirements of the Town of Northfield Zoning By-Laws, Sections 3.4C, 3.5, 10.3 and 11, and have asserted that it will comply with all laws, ordinances and regulations.
11.08.03.02	Building Permit	<p>The Applicant has indicated that it will file all required State and Local permits.</p> <p>The Applicant provided Proposed Site Drawings, prepared by Field Engineering Co., Inc., Consulting Engineers and stamped by Richard R. Riccio III, a licensed MA Professional Engineer.</p> <p>Beacon notes that the Proposed Site Drawings is for Special Permit use only and is not construction level design documents. Beacon recommends that the Applicant provide final construction drawings to the Planning Board, stamped by a licensed professional engineer register in MA prior to seeking a Building Permit.</p>
11.08.03.03	Fees	The Applicant claims to have made all required payments for filing fees for the Special Permit and Site Plan Review. Payment for Building Permit Fees will be required in connection with the filing of the Building Permit application.
11.08.03.04	Site Plan Review (1) General	<p>The Applicant has provided full-scale Proposed Site Drawings, dated 12/28/2020, stamped and signed by a Professional Civil Engineer licensed in Massachusetts. Site Drawings include:</p> <ul style="list-style-type: none"> <li>• Overall Assemblage Plan SL-1</li> <li>• Existing Conditions Plan EC-1</li> <li>• Site Plan SP-1</li> <li>• Sedimentation &amp; Erosion Control SEC-1</li> <li>• Site Details DET-1</li> <li>• Notes and Legend N-1</li> </ul> <p>Site Drawings are for Permitting and <u>are not</u> Construction Drawings</p>

<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(a). Site Plan showing:</u> <i>i. Property lines and physical features;</i></p>	<p>The Applicant has provided a Site Plan detailing all Property lines and physical features including roadways. Site Drawings dated 12/28/2020, page SL-1.</p>
	<p><i>ii. Proposed changes to the landscape;</i></p>	<p>The Applicant claims that existing conditions of the two parcels consist mainly of farmed field areas with some peripheral wooded areas along the easterly side of the parcel, adjacent to Pine Meadow Brook. Further, Applicant claims that the parcels consist of mainly farmed upland areas with some bordering vegetated wetland areas. Portions of the parcels fall within FEMA Flood Zones A1, A16, A17, B and C.</p> <p>The Applicant claims construction will not require any significant clearing of vegetation within the footprint of Array B, and Array B will follow the contours of the land with minimal site grading required. In areas targeted for livestock grazing, disturbed areas will be hydroseeded with a conservation/wildlife mix for erosion control and to establish a managed pasture.</p> <p>The Applicant will construct an 18-foot-wide permanent gravel access road at the northern part of the parcel Map 54, Lot B5. The gravel access road will run east/west. A 40-foot by 60-foot concrete equipment pad will be constructed adjacent to the northern portion of the gravel access road. The concrete equipment pad will house, among others, the inverters, switchgear, transformer, metering equipment, battery storage and HVAC equipment.</p> <p>An irrigation well for agricultural operations and livestock hydration will be constructed adjacent to the concrete equipment pad.</p> <p>Point of Interconnection of Array B to Eversource will be on the access road and Pine Meadow Road. It is expected that Eversource will require the installation of 3 new utility poles along the access road spaced approximately 50 feet and one new utility pole on Pine Meadow Road.</p> <p>The Applicant proposed to enclose Array B entirely with an 8-foot wire-woven agricultural fence. Applicant has not proposed any vegetative screening for Array B as they anticipate the setbacks provide sufficient open-area buffer from Pine Meadow Road and neighboring abutters.</p>

		While the Applicant indicated lighting systems will not be required for Array B, Beacon notes that the battery storage system will be contained in a Conex box which will likely have interior lights to facilitate maintenance activities. These lights will not be in constant use.
	<i>iii. Locations of wetlands and Priority Habitat Areas;</i>	<p>As shown in Site Drawings dated 12/28/2020, page SP-1, Array B is bordered to the east with vegetated wetlands. Beacon notes that the Applicant’s proposed Site Plan locates Array B’s fence within the 100-foot wetland buffer. It is expected that the Applicant will address this issue in the Notice of Intent filing with the Northfield Conservation Commission.</p> <p>The Applicant claims that no portion of Array B is located within any mapped habitat according to the latest Natural Heritage and Endangered Species Program (NHESP). Beacon recommends that the Applicant file a Notice of Intent with NHESP to confirm the non-existence of native species listed as endangered, threatened or of special concern.</p>
	<i>iv. Locations of Floodplains;</i>	As shown in Site Drawings dated 12/28/2020, page SP-1, portions of the parcels fall within FEMA Flood Zones A1, A16, A17, B and C.
	<i>v. Locations of Priority Heritage landscapes/ National Historic districts;</i>	The Applicant did not address whether Array B is located within Priority Heritage landscapes or local or National Historic districts. Beacon notes that the parcels subject to this application are zoned Residential-Agricultural.
	<i>vi. List of hazardous materials;</i>	<p>The Applicant claims that the only potential hazardous materials exist in the equipment located on the concrete equipment pad. Fluids contained in inverters, transformers, HVAC equipment and lithium-ion batteries are considered hazardous if released. The Applicant suggests that since these fluids are stored in self-contained vessels, risk for release is minimal. Beacon recommends that the Applicant provide detailed operations, maintenance and remedial procedures to address issues pertaining to fluid release and impact on vegetation and stormwater.</p> <p>Further, Beacon recommends that the Applicant provide more detailed information on the proposed battery storage and containment equipment, in addition to the HVAC equipment. Specifically, the Applicant should provide documentation on the fluids contained in these systems in addition to the fire suppression systems to be used.</p> <p>While the Applicant claims that since Array B will be remotely monitored, any mechanical failures would be detected timely. Beacon assumes the referenced remote monitoring is provided by Array B’s Data Acquisition System which provides near real-time electric generation information as to system performance.</p>

	<p><i>vii. Blueprints or drawings signed by Professional Engineer licensed in MA;</i></p>	<p>Applicant has provided full-scale Proposed Site Drawings, dated 12/28/2020, stamped and signed by a Professional Civil Engineer licensed in Massachusetts. Site Drawings include:</p> <ul style="list-style-type: none"> <li>• Overall Assemblage Plan SL-1</li> <li>• Existing Conditions Plan EC-1</li> <li>• Site Plan SP-1</li> <li>• Sedimentation &amp; Erosion Control SEC-1</li> <li>• Site Details DET-1</li> <li>• Notes and Legend N-1</li> </ul> <p>Site Drawings are for Permitting and are not Construction Drawings. Shading from nearby trees in the eastern part of the parcel has been delineated and is not anticipated by the Applicant to be a concern.</p>
	<p><i>viii. Electrical diagram;</i></p>	<p>The Applicant provided a copy of the Preliminary Single Line Drawing filed with Eversource on 1/29/2019 in connection with its application for interconnection of distributed generation. The Single Line Drawing, and the application supports a larger project and has since been re-configured and sized. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.</p>
	<p><i>ix. Documentation of the major system components;</i></p>	<p>The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. The application requires documentation of all major system components, including, but not limited to, among others, inverters, modules, switchgear, transformers, relays and energy storage systems. Cutsheet documentation provided in connection with the Special Permit/Site Plan Approval applications differs from stated equipment specified to Eversource. Further, documentation of all major equipment anticipated was not provided, and has been requested. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.</p>
	<p><i>x. Name, address and contact information of the installer;</i></p>	<p>The Applicant claims that it will competitively bid Engineering, Procurement and Construction (EPC) services prior to commencement of construction. Beacon recommends that the Applicant identify and provide all required information to the Planning Board in connection with its application for a Building Permit.</p>
	<p><i>xi. Name, address and contact information of the project proponent or property owner;</i></p>	<p>The Applicant has provided all required identification and contact information on the property owner, along with a letter from the property owner to the Northfield community endorsing the project. Beacon has a copy of the application for Site Plan Approval and therefore does not have a signed document, but assumes the original documents contain the required signatures.</p>

	<p><i>xii. Name, contact information and signature of any agents representing project proponent.</i></p>	<p>The Applicant has provided all of the required identification and contact information.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(b). Site Control</u></p>	<p>The Applicant has provided a copy of the original site Option Agreement between the property owner and Applicant executed on 12/21/2018, which provides the Applicant with an irrevocable and exclusive Option to lease the property. Under the Option Agreement, the Land Lease Agreement has an initial term of 20-years, with an option to extend the Lease term for up to three 5-year extensions, for a total of up to 35 years.</p> <p>A search of the Franklin County Registry of Deeds revealed that on 12/18/2020, the Applicant and property owner executed an Amended and Restated Notice of Option Agreement extending the Option period for 36 months.</p> <p>Array B is contemplated to be constructed as a dual-use solar facility. As such, Array B will be constructed to allow for continued use of the property for agricultural purposes. Under the terms of the Lease Agreement, the property owner has primary responsibility to serve as the active farmer. If the property owner is unable to fulfill that obligation, the Applicant will collaborate with the property owner to facilitate the on-going agricultural use of the property.</p> <p>Beacon recommends that the Planning Board Condition the Special Permit by requiring continued agricultural use, and providing annual documentation demonstrating that the Applicant has utilized agricultural best practices along with a copy of the Annual Reports filed with the Massachusetts Department of Agriculture and Massachusetts Department of Energy Resources as required under the Commonwealth’s SMART Program.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(c). Operation &amp; Maintenance Plan</u></p>	<p>The Applicant provided an Operations and Maintenance (O&amp;M) Plan addressing O&amp;M during construction, post construction and with respect to post construction Stormwater Management Systems.</p> <p>To ensure adequate access for Public Safety vehicles to Array B, Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Applicant provide year-round access to the concrete equipment pad and the overall system, including providing the Town on an annual basis with adequate documentation addressing snow removal services on the gravel access road.</p>

		Beacon further recommends that in connection with its jurisdictional review of the Notice of Intent to be filed with the Northfield Conservation Commission, a review of the proposed annual O&M Stormwater Management Systems plan should be evaluated for best management practices.
11.08.03.04	<p><b>Site Plan Review</b></p> <p><b>(2) Required Documents</b></p> <p><u>(d). Utility Notification</u></p>	The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.
11.08.03.04	<p><b>Site Plan Review</b></p> <p><b>(2) Required Documents</b></p> <p><u>(e). Zoning District Designation</u></p>	As required under the Zoning By-Law, the Applicant provided a copy of the Town’s Zoning Map and identified the location of the proposed project. Beacon notes that the project is sited in the Residential-Agricultural Zone.
11.08.03.04	<p><b>Site Plan Review</b></p> <p><b>(2) Required Documents</b></p> <p><u>(f). Proof of Liability Insurance</u></p>	The Applicant provided a sample Certificate of Insurance providing proof of Liability Insurance as required in the Zoning By-Law. Beacon recommends that the Planning Board seek guidance from the Town’s insurance agent with regard to the limits of coverage. Specifically, the Applicant’s Commercial General Liability coverage limits may be inadequate for a project of this size. Excess/Umbrella Liability coverage in an amount of not less than \$3 to \$5 million is common for a project of this size. Further, proof of Automobile liability coverage and Workers Compensation and Employers’ Liability coverage should be provided. The Town of Northfield, along with the property owner should be named as a Certificate Holder.
11.08.03.04	<p><b>Site Plan Review</b></p> <p><b>(2) Required Documents</b></p> <p><u>(g). Financial Surety</u></p>	<p>The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc.</p> <p>The Decommissioning Plan includes labor and equipment costs for the removal of Array B and the restoration necessary, excluding normal wear and tear. Further, the cost estimate includes an approximate 2.45 percent annual increase to account for inflation.</p> <p>Beacon notes that given the size of Array B, the estimated total cost in 2020 dollars likely understates the magnitude of the effort by a factor of 2. Beacon recommends that the Planning Board request the Applicant to reconsider its projected cost estimate and provide supporting documentation of actual decommissioning costs for projects owned by the Applicant of similar size.</p> <p>Beacon recommends that the form of Financial Surety be an annual renewing irrevocable Bond with the Town of Northfield as the named bond holder.</p>



<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(3) Setback and Height Requirements</b></p>	<p>As required under the Zoning By-Law, setback requirements for all large-scale ground-mounted solar photovoltaic installations, including appurtenant structures and parking areas are at least 100-feet from any property boundary.</p> <p>As shown in Site Drawings dated 12/28/2020, page SP-1, the majority of the 18-foot-wide gravel access road and security fencing on the northern part of the parcel in addition to the security fencing on portions of the southern part of the parcel are sited <u>within</u> the 100-foot setback restriction.</p> <p>The Applicant claims that no structure will exceed the 20-foot height limitation of the Zoning By-Law. Beacon notes that while the maximum height of the top of the module when in full tracking position is expected to be 13-feet at the highest point, the Applicant should confirm its continued compliance in its submission for a Building Permit. Further, no information has been provided by the Applicant with respect to the height of the major equipment and containers to be sited on the concrete equipment pad.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(4) Appurtenant Structures</b></p>	<p>The Applicant claims that the design of the appurtenant structures of Array B has been prepared to be compatible and consistent with commonly used structures for the industry, that the concrete equipment pads are setback from the road and/or screened with vegetation.</p> <p>Beacon notes that the concrete equipment pad and associated equipment, while located in the northeast portion of the parcel, adjacent to vegetated wetlands and a canopy of trees, is not otherwise screened with any additional vegetation. Given the location of the concrete equipment pad, it does not appear to present a visual concern.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(b). Lighting</u></p>	<p>While the Applicant indicated lighting systems will not be required for Array B, Beacon notes that the battery storage system will be contained in a Conex box which will likely have interior lights to facilitate maintenance activities. These lights will not be in constant use.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(c). Signage</u></p>	<p>As shown in Site Drawings dated 12/28/2020, page DET-1, the Applicant has provided a mock-up of a sample Site Identification sign. While the content of the sign provides contact information in the event of an emergency, Beacon recommends that the Applicant or its Asset Manager/Operator provide a number that is available 24/7/365 to address emergency concerns. This is particularly important for Public Safety personnel.</p>

		<p>The Applicant has also indicated that signage will be installed as required for safety under state and local requirements and the National Electrical Code. These signs are expected to be attached to the 8-foot woven-wire agricultural fence and on appropriate equipment located on the concrete equipment pad.</p>
11.08.03.04	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(d). Utility Connections</u></p>	<p>The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. Beacon understands that the interconnection process is an iterative process and we have requested updated documentation on 2/2/2021.</p> <p>All major equipment, including but not limited to inverters, switchgear, transformers, relays and energy storage systems will be located on the 40-foot by 60-foot concrete equipment pad.</p> <p>The Applicant will construct an 18-foot-wide permanent gravel access road at the northern part of the parcel Map 54, Lot B5. The gravel access road will run east/west. The Applicant claims that a conduit will be constructed under the gravel access road to support medium voltage wiring from the concrete equipment pad to the point of interconnection at the gravel access road entrance at Pine Meadow Road.</p> <p>As shown in Site Drawings dated 12/28/2020, page SP-1, a riser pole owned by the Applicant will be installed in addition to 2 new Eversource utility poles along the access road spaced approximately 50 feet apart, plus one new Eversource utility pole located on Pine Meadow Road.</p> <p>The Applicant has not addressed how it will combine all electrical connections throughout Array B.</p>
11.08.03.04	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(e). Roads</u></p>	<p>The Applicant claims to have designed the 18-foot-wide permanent gravel access road to minimize grading by following the existing property grade. The gravel access road entrance will be fully gated and located in proximity to the point of interconnection with Eversource. The security gate will be 20-feet wide.</p> <p>As noted above, the siting of 4 new utility poles will likely necessitate some tree removal near the intersection of the gravel access road entrance and Pine Meadow Road. The Applicant did not specify the number of trees to be removed. Beacon anticipates that those details are subject to final design considerations with Eversource.</p>
11.08.03.04	<b>Site Plan Review</b>	<p>The Applicant claims, and has supported in the O&amp;M documentation, that the use of any chemicals, herbicides or pesticides within Array B will be prohibited.</p>

	<p><b>(5) Design and Performance Standards</b></p> <p><u>(f). Control of Vegetation</u></p>	<p>Beacon recommends that the Planning Board Condition the Special Permit by prohibiting the use of any chemicals, herbicides or pesticides within Array B and in all portions of the parcels under the Applicant’s control.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b></p> <p><b>(5) Design and Performance Standards</b></p> <p><u>(g). Hazardous Materials</u></p>	<p>The Applicant claims that the only potential hazardous materials exist in the equipment located on the concrete equipment pad. Fluids contained in inverters, transformers, HVAC equipment and lithium-ion batteries are considered hazardous if released. The Applicant suggests that since these fluids are stored in self-contained vessels, risk for release is minimal. Beacon recommends that the Applicant provide detailed operations, maintenance and remedial procedures to address issues pertaining to fluid release and impact on vegetation and stormwater.</p> <p>Further, Beacon recommends that the Applicant provide more detailed information on the proposed battery storage and containment equipment, in addition to the HVAC equipment. Specifically, the Applicant should provide documentation on the fluids contained in these systems in addition to the fire suppression systems to be used.</p> <p>While the Applicant claims that since Array B will be remotely monitored, any mechanical failures would be detected timely. Beacon assumes the remote monitoring is provided by the Data Acquisition System which provides near real-time electric generation information as to system performance.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b></p> <p><b>(5) Design and Performance Standards</b></p> <p><u>(h). Noise</u></p>	<p>The Zoning By-Law limits sound or noise levels to not greater than 50 dBA at the boundary of the property.</p> <p>The Applicant indicated that the only noise associated with Array B originates from the transformers and inverters, which have been strategically located such that the audible radius from the concrete equipment pads results on no audible impact to the boundaries of the property. Beacon notes that the battery storage facilities will be climate controlled by on-site HVAC equipment.</p> <p>Beacon recommends that the Planning Board require the Applicant to provide a noise study of the combined solar photovoltaic array equipment and associated battery storage system demonstrating dBA levels at the boundary of the property.</p>

<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(6) Safety and Environmental Standards</b>  <u>(a). Emergency Services</u></p>	<p>The Applicant indicated that prior to making application for a Building Permit, the selected Installer will provide Public Safety officials with a project summary, a full complement of construction drawings and electrical plans. Further, prior to commissioning Array B, the selected Installer will provide training to Public Safety personnel on the operations, maintenance and de-energizing Array B.</p> <p>Beacon recommends that prior to commissioning, the Applicant should provide the Town with a Safety Manual describing the components of Array B and detailing safe de-energizing procedures of all major components including inverters, battery systems and modules. While it is not expected such detailed de-energizing procedures will be required, such information would prove beneficial in the event of a significant emergency.</p> <p>The gravel access road entrance will be fully gated and locked at all times. A Knox Box (or other option approved by the Town’s Public Safety officials) will enable emergency access.</p> <p>Beacon notes that BlueWave Project Development LLC intends to sell BWC Pine Meadow Brook LLC. Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Town be noticed on any assignment, transfer or sale of BWC Pine Meadow Brook LLC.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(6) Safety and Environmental Standards</b>  <u>(b). Land Clearing, Soil Erosion and Habitat Impacts</u></p>	<p>The Applicant claims that there is minimal clearing of any natural vegetation as shown in the Site Drawings dated 12/28/2020, pages EC-1 and SP-1.</p> <p>Further, the Applicant claims that soil excavation and site grading requirements are also minimal. The selected Installer will be required to comply with all soil and stormwater requirements set forth in the Stormwater Pollution Prevention Plan under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, and by the Northfield Conservation Commission.</p>
<p><b>11.08.04.01</b></p>	<p><b>Monitoring, Maintenance and Reporting – Solar Photovoltaic Installation Conditions</b></p>	<p>The Applicant provided an Operations and Maintenance (O&amp;M) Plan addressing O&amp;M during construction, post construction and with respect to Stormwater Management Systems.</p> <p>To ensure adequate access for Public Safety vehicles to Array B, Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Applicant provide year-round access to the concrete equipment pad and the overall system, including providing the Town</p>

		<p>on an annual basis with adequate documentation demonstrating the provision for snow removal services on the gravel access road.</p> <p>Beacon further recommends that in connection with its jurisdictional review of the Notice of Intent to be filed with the Northfield Conservation Commission, a review of the proposed annual O&amp;M Stormwater Management Systems plan should be evaluated for best management practices.</p> <p>Further, prior to commissioning Array B, the selected Installer will provide training to Public Safety personnel on the operations, maintenance and de-energizing Array B. The gravel access road entrance will be fully gated and locked at all times. A Knox Box (or other option approved by the Town’s Public Safety officials) will enable emergency access.</p>
11.08.04.02	<b>Monitoring, Maintenance and Reporting – Modifications</b>	Beacon recommends that the Planning Board Condition the Special Permit to require that any material modifications to Array B, specifically as it relates to Array B DC capacity, battery storage, changes to the size or location of the concrete equipment pad, and/or changes to the design of the utility interconnection as shown in the Site Drawings dated 12/28/2020, page SP-1, among others, be immediately provided to the Planning Board for approval.
11.08.04.03	<b>Monitoring, Maintenance and Reporting – Annual Reporting</b>	In addition to the reporting requirements set forth in the Zoning By-Law, Beacon recommends that the Planning Board require the Applicant to provide copies of any annual reports filed with the Massachusetts Department of Agriculture and Massachusetts Department of Energy Resources in compliance with SMART Program qualifications. Such annual reporting shall include, but not be limited to the productivity of the crop(s) and herd, including pounds harvested and/or grazed, herd size growth, success of the crop if applicable, and potential changes.
11.08.05.01	<b>Abandonment or Decommissioning – Removal Requirements</b> (1) Physical removal (2) Disposal of waste (3) Stabilization or re-vegetation	The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc. The Decommissioning Plan included a scope of work, and labor and equipment cost for the removal of Array B and the restoration of the parcels to the original condition, excluding normal wear and tear.
11.08.05.02	<b>Abandonment or Decommissioning – Abandonment</b>	In addition to the requirements and obligations set forth in the Zoning By-Law, Beacon recommends that the Planning Board require the Applicant and property owner to address Decommissioning Requirements in its Lease agreements and provide evidence of such obligations.
11.08.06	<b>Financial Surety</b>	The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc. The Decommissioning Plan includes a scope of work and labor and equipment costs for the removal of Array B and the restoration of the parcels to the

		<p>original condition, excluding normal wear and tear. The cost estimate includes an approximate 2.45 percent annual increase to account for inflation.</p> <p>Beacon notes that given the size of Array B, the estimated total cost in 2020 dollars likely understates the magnitude of the effort by a factor of 2. Beacon recommends that the Planning Board request the Applicant to reconsider its projected cost estimate and provide supporting documentation of actual decommissioning costs for projects owned by the Applicant of similar size.</p> <p>Beacon recommends that the form of Financial Surety be an annual renewing irrevocable Bond with the Town of Northfield as the named bond holder.</p>
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On a personal note, we very much appreciate the opportunity to support the Northfield Planning Board in its review of these Large-Scale Ground-Mounted Solar Photovoltaic systems. If you have any questions or need additional information, please do not hesitate to contact me directly at 617-469-2172.

Best regards,

*Beth S. Greenblatt*

Beth S. Greenblatt



**Beth S. Greenblatt**  
*Managing Director*

February 8, 2021

Town of Northfield  
Mr. Stephen Serebinski, Chair  
Northfield Planning Board  
69 Main Street  
Northfield, MA 01360

*RE: Special Permit for Pine Meadow Road Solar Array "C", Assessor Map 54, Lot B5 and Map 55, Lot B1*

Dear Chairman Serebinski :

Beacon Integrated Solutions ("Beacon") was engaged by the Town of Northfield, Planning Board to review the Application filed by BWC Pine Meadow Brook, LLC for three Large-Scale Ground-Mounted Solar Photovoltaic Systems and to report on our findings with respect to the Applicant's compliance with the Northfield Solar Generation Zoning By-Law. The findings presented herein pertain to Pine Meadow Road Solar Array C.

**Background:**

On December 28, 2020, BWC Pine Meadow Brook, LLC, a Delaware special purpose entity and wholly-owned limited liability company of BlueWave Project Development LLC, with a legal business address located at 111 Huntington Avenue, Suite 650, Boston, MA 02199 ("Applicant"), through its Consulting Engineer, Field Engineering Co., Inc., filed an application to construct a utility-scale solar facility on 612 Pine Meadow Road in Northfield under the Town of Northfield Zoning By-laws for a Special Permit pursuant to Section 3.4, a Site Plan Review pursuant to Section 3.5 and in accordance with the Solar Generation Zoning By-law, Section 11.08.

The Applicant is proposing to construct, own, operate and maintain a ground-mounted fixed-tilt solar photovoltaic array ("Pine Meadow Road Array C", herein after referred to as "Array C"), sized at 0.567-megawatts (MW) DC/approximately 0.5-megawatts (MW) AC, paired with 0.5 megawatts (MW) of DC-coupled energy storage, plus appurtenant equipment on cleared agricultural land located across one parcel comprised of a total area of approximately 13.1 acres on Pine Meadow Road, Northfield MA. The area utilized by Array C has not been provided.

The Parcel ID number is Assessor Map 54, Lot A8-1. Array C will be accessed via a newly constructed gravel access drive that is merged with the existing property driveway off of Pine Meadow Road. Array C will be completely enclosed by an 8-foot woven-wire agricultural fence.

Beacon's findings are presented herein.



GENERAL INFORMATION AND OVERVIEW		
<b>Parcel Identification</b>	<b>Assessor Map</b>	Map 54, Lot A8-15 – Book 5819, Page 29
<b>Array C Details</b>		0.567 MW DC/approximately 0.5 MW AC 0.5 MW of DC-coupled energy storage (lithium-ion batteries) Approximately 1,350 solar modules, mounted on pile-driven poles
<b>Applicant Parties</b>	<b>Property Owner</b>	Jacob A. and Robin C. L’Etoile 612 Pine Meadow Road, Northfield, MA 01360
	<b>Array C Applicant</b>	BWC Pine Meadow Brook LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 DE Limited Liability Company, Organized on January 4, 2019 MA Foreign Limited Liability Company, Registered on March 30, 2020
	<b>Array C Option to Lease Party</b>	BWC Otter Run, LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 DE Limited Liability Company, Organized on March 11, 2019 MA Foreign Limited Liability Company, Registered on March 20, 2019  <u>Also named:</u> BWC Holdings, LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 DE Limited Liability Company, Organized on August 10, 2015 MA Foreign Limited Liability Company, Registered on August 25, 2015  BlueWave MA, LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 Name was changed to BlueWave Capital, LLC on May 4, 2019; and then changed to BlueWave Project Development LLC on November 25, 2019
	<b>Array C Owner Parent Company</b>	BlueWave Project Development LLC 111 Huntington Avenue, Suite 650, Boston, MA 02199 DE Limited Liability Company, Organized on January 30, 2012 MA Foreign Limited Liability Company, Registered on January 31, 2012
	<b>Long-term Array C Owner/Operator</b>	TBD. BlueWave Project Development LLC intends to sell BWC Otter Run, LLC

	<b>Consulting Engineer</b>	Field Engineering Co., Inc Richard R. Riccio III, P.E., License #45898 11D Industrial Drive, P.O. Box 1178, Mattapoisett, MA 02739
	<b>Project Surveyor</b>	DGT Associates Surveying & Engineering 255 Park Avenue, Suite 500, Worcester, MA 01609
	<b>Asset Manager</b>	TBD-Responsible for operations and annual O&M

ZONING BY-LAW REFERENCE	ZONING BY-LAW SECTION	BEACON FINDINGS
11.08.03.01	<b>Compliance with Laws, Ordinances and Regulations</b>	The Applicant addressed the specific requirements of the Town of Northfield Zoning By-Laws, Sections 3.4C, 3.5, 10.3 and 11, and have asserted that it will comply with all laws, ordinances and regulations.
11.08.03.02	<b>Building Permit</b>	<p>The Applicant has indicated that it will file all required State and Local permits.</p> <p>The Applicant provided Proposed Site Drawings, prepared by Field Engineering Co., Inc., Consulting Engineers and stamped by Richard R. Riccio III, a licensed MA Professional Engineer.</p> <p>Beacon notes that the Proposed Site Drawings is for Special Permit use only and is not construction level design documents. Beacon recommends that the Applicant provide final construction drawings to the Planning Board, stamped by a licensed professional engineer register in MA prior to seeking a Building Permit.</p>
11.08.03.03	<b>Fees</b>	The Applicant claims to have made all required payments for filing fees for the Special Permit and Site Plan Review. Payment for Building Permit Fees will be required in connection with the filing of the Building Permit application.
11.08.03.04	<b>Site Plan Review (1) General</b>	<p>The Applicant has provided full-scale Proposed Site Drawings, dated 12/28/2020, stamped and signed by a Professional Civil Engineer licensed in Massachusetts. Site Drawings include:</p> <ul style="list-style-type: none"> <li>• Overall Assemblage Plan SL-1</li> <li>• Existing Conditions Plan EC-1</li> <li>• Site Plan SP-1</li> <li>• Sedimentation &amp; Erosion Control SEC-1</li> <li>• Site Details DET-1</li> <li>• Notes and Legend N-1</li> </ul> <p>Site Drawings are for Permitting and <u>are not</u> Construction Drawings</p>

<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(a). Site Plan showing:</u> <i>i. Property lines and physical features;</i></p>	<p>The Applicant has provided a Site Plan detailing all Property lines and physical features including roadways. Site Drawings dated 12/28/2020, page SL-1.</p>
	<p><i>ii. Proposed changes to the landscape;</i></p>	<p>The Applicant claims that existing conditions of the one parcel consists mainly of field areas and an existing single-family dwelling and a driveway. The parcel has existing streams associated with the Connecticut River along the easterly and westerly portions of the parcel. Portions of the parcels fall within FEMA Flood Zones A1, A16, A17, B and C.</p> <p>The Applicant claims construction will not require any significant clearing of vegetation within the footprint of Array C, and Array C will follow the contours of the land with minimal site grading required.</p> <p>The Applicant will construct an 18-foot-wide permanent gravel access road at the southern part of the parcel Map 54, Lot A8-1. The gravel access road will run north/south and connect to the existing driveway. A 20-foot by 40-foot concrete equipment pad will be constructed in the southern-most portion of Array C, adjacent to the entrance gate of the gravel access road. The concrete equipment pad will house, among others, the inverters, switchgear, transformer, metering equipment, battery storage and HVAC equipment.</p> <p>The Point of Interconnection of Array C to Eversource will be located on the driveway, and on Pine Meadow Road. It is expected that Eversource will require the installation of 3 new utility poles along the driveway spaced approximately 50 feet and one new utility pole on Pine Meadow Road.</p> <p>The Applicant proposed to enclose Array C entirely with an 8-foot wire-woven agricultural fence. Applicant has not proposed any vegetative screening for Array C as they anticipate the setbacks provide sufficient open-area buffer from Pine Meadow Road and neighboring abutters.</p> <p>While the Applicant indicated lighting systems will not be required for Array C, Beacon notes that the battery storage system will be contained in a Conex box which will likely have interior lights to facilitate maintenance activities. These lights will not be in constant use.</p>

	<p><i>iii. Locations of wetlands and Priority Habitat Areas;</i></p>	<p>As shown in Site Drawings dated 12/28/2020, page SP-1, Array C is not bordered by any mapped wetlands.</p> <p>The Applicant claims that no portion of Array C is located within any mapped habitat according to the latest Natural Heritage and Endangered Species Program (NHESP). Beacon recommends that the Applicant file a Notice of Intent with NHESP to confirm the non-existence of native species listed as endangered, threatened or of special concern.</p>
	<p><i>iv. Locations of Floodplains;</i></p>	<p>As shown in Site Drawings dated 12/28/2020, page SP-1, portions of the parcels fall within FEMA Flood Zones A1, A16, A17, B and C. Further, Array C is sited just outside of the 200-foot Riverfront on the northern, eastern and western portions of Array C.</p>
	<p><i>v. Locations of Priority Heritage landscapes/ National Historic districts;</i></p>	<p>The Applicant did not address whether Array C is located within Priority Heritage landscapes or local or National Historic districts. Beacon notes that the parcels subject to this application are zoned Residential-Agricultural.</p>
	<p><i>vi. List of hazardous materials;</i></p>	<p>The Applicant claims that the only potential hazardous materials exist in the equipment located on the concrete equipment pad. Fluids contained in inverters, transformers, HVAC equipment and lithium-ion batteries are considered hazardous if released. The Applicant suggests that since these fluids are stored in self-contained vessels, risk for release is minimal. Beacon recommends that the Applicant provide detailed operations, maintenance and remedial procedures to address issues pertaining to fluid release and impact on vegetation and stormwater.</p> <p>Further, Beacon recommends that the Applicant provide more detailed information on the proposed battery storage and containment equipment, in addition to the HVAC equipment. Specifically, the Applicant should provide documentation on the fluids contained in these systems in addition to the fire suppression systems to be used.</p> <p>While the Applicant claims that since Array C will be remotely monitored, any mechanical failures would be detected timely. Beacon assumes the referenced remote monitoring is provided by Array C's Data Acquisition System which provides near real-time electric generation information as to system performance.</p>
	<p><i>vii. Blueprints or drawings signed by Professional Engineer licensed in MA;</i></p>	<p>Applicant has provided full-scale Proposed Site Drawings, dated 12/28/2020, stamped and signed by a Professional Civil Engineer licensed in Massachusetts. Site Drawings include:</p> <ul style="list-style-type: none"> <li>• Overall Assemblage Plan SL-1</li> <li>• Existing Conditions Plan EC-1</li> <li>• Site Plan SP-1</li> </ul>

		<ul style="list-style-type: none"> <li>• Sedimentation &amp; Erosion Control SEC-1</li> <li>• Site Details DET-1</li> <li>• Notes and Legend N-1</li> </ul> <p>Site Drawings are for Permitting and are not Construction Drawings. Shading from any nearby trees to the east or west, or the single-family dwelling is not anticipated by the Applicant to be a concern.</p>
	<i>viii. Electrical diagram;</i>	The Applicant provided a copy of the Preliminary Single Line Drawing filed with Eversource on 1/29/2019 in connection with its application for interconnection of distributed generation. The Single Line Drawing, and the application supports a larger project and has since been re-configured and sized. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.
	<i>ix. Documentation of the major system components;</i>	The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. The application requires documentation of all major system components, including, but not limited to, among others, inverters, modules, switchgear, transformers, relays and energy storage systems. Cutsheet documentation provided in connection with the Special Permit/Site Plan Approval applications differs from stated equipment specified to Eversource. Further, documentation of all major equipment anticipated was not provided, and has been requested. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.
	<i>x. Name, address and contact information of the installer;</i>	The Applicant claims that it will competitively bid Engineering, Procurement and Construction (EPC) services prior to commencement of construction. Beacon recommends that the Applicant identify and provide all required information to the Planning Board in connection with its application for a Building Permit.
	<i>xi. Name, address and contact information of the project proponent or property owner;</i>	The Applicant has provided all required identification and contact information on the property owner. Beacon has a copy of the application for Site Plan Approval and therefore does not have a signed document, but assumes the original documents contain the required signatures.
	<i>xii. Name, contact information and signature of any agents representing project proponent.</i>	The Applicant has provided all of the required identification and contact information.

<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(b). Site Control</u></p>	<p>The Applicant has provided a copy of the original site Option Agreement between the property owner and Applicant executed on 2/27/2019, which provides the Applicant with an irrevocable and exclusive Option to lease the property. Under the Option Agreement, the Land Lease Agreement has an initial term of 20-years, with an option to extend the Lease term for up to three 5-year extensions, for a total of up to 35 years.</p> <p>Beacon notes that the Option Agreement between the property owner and BWC Otter Run, LLC has not been filed with the Franklin County Registry of Deeds.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(c). Operation &amp; Maintenance Plan</u></p>	<p>The Applicant provided an Operations and Maintenance (O&amp;M) Plan addressing O&amp;M during construction, post construction and with respect to post construction Stormwater Management Systems.</p> <p>To ensure adequate access for Public Safety vehicles to Array C, Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Applicant provide year-round access to the concrete equipment pad and the overall system, including providing the Town on an annual basis with adequate documentation addressing snow removal services on the gravel access road.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(d). Utility Notification</u></p>	<p>The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. While Beacon understands that the interconnection process is an iterative process, we have requested updated documentation on 2/2/2021.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(e). Zoning District Designation</u></p>	<p>As required under the Zoning By-Law, the Applicant provided a copy of the Town's Zoning Map and identified the location of the proposed project. Beacon notes that the project is sited in the Residential-Agricultural Zone.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(f). Proof of Liability Insurance</u></p>	<p>The Applicant provided a sample Certificate of Insurance providing proof of Liability Insurance as required in the Zoning By-Law. Beacon recommends that the Planning Board seek guidance from the Town's insurance agent with regard to the limits of coverage. Specifically, the Applicant's Commercial General Liability coverage limits may be inadequate for a project of this size. Excess/Umbrella Liability coverage in an amount of not less than \$2 to \$4 million is common for a project of this size. Further, proof of Automobile liability coverage and Workers Compensation and Employers' Liability coverage should be provided. The Town of Northfield, along with the property owner should be named as a Certificate Holder.</p>

<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(2) Required Documents</b> <u>(g). Financial Surety</u></p>	<p>The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc.</p> <p>The Decommissioning Plan includes labor and equipment costs for the removal of Array C and the restoration necessary, excluding normal wear and tear. Further, the cost estimate includes an approximate 2.45 percent annual increase to account for inflation.</p> <p>Beacon notes that given the size of Array C, the estimated total cost in 2020 dollars likely understates the magnitude of the effort by a factor of 2. Beacon recommends that the Planning Board request the Applicant to reconsider its projected cost estimate and provide supporting documentation of actual decommissioning costs for projects owned by the Applicant of similar size.</p> <p>Beacon recommends that the form of Financial Surety be an annual renewing irrevocable Bond with the Town of Northfield as the named bond holder.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(3) Setback and Height Requirements</b></p>	<p>As required under the Zoning By-Law, setback requirements for all large-scale ground-mounted solar photovoltaic installations, including appurtenant structures and parking areas are at least 100-feet from any property boundary.</p> <p>As shown in Site Drawings dated 12/28/2020, page SP-1, the security fencing on the western part of the parcel is sited <u>within</u> the 100-foot setback restriction.</p> <p>The Applicant claims that no structure will exceed the 20-foot height limitation of the Zoning By-Law. Beacon notes that while the maximum height of the modules is likely less than 20-feet at the highest point, the Applicant should confirm its continued compliance in its submission for a Building Permit. Further, no information has been provided by the Applicant with respect to the height of the major equipment and containers to be sited on the concrete equipment pad.</p> <p>While the concrete equipment pad is well contained within the property, it is possible that the concrete equipment pad will be visible to abutters from the southern and western portions of the parcel. Beacon recommends that the Planning Board condition the Special Permit to require the Applicant to conduct a “balloon test” from the highest point expected of the equipment on the concrete pad to discern the visual impact.</p>

<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(4) Appurtenant Structures</b></p>	<p>The Applicant claims that the design of the appurtenant structures of Array C has been prepared to be compatible and consistent with commonly used structures for the industry, that the concrete equipment pads are setback from the road and/or screened with vegetation.</p> <p>As noted above, while the concrete equipment pad is contained within the property, it is possible that the concrete equipment pad will be visible to abutters to the south and west of the parcel. Beacon recommends that the Planning Board condition the Special Permit to require the Applicant to conduct a “balloon test” from the highest point expected of the equipment on the concrete pad to discern the visual impact. Vegetative screening with native plantings of the equipment on the concrete equipment pad may be desirable.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(b). Lighting</u></p>	<p>While the Applicant indicated lighting systems will not be required for Array C, Beacon notes that the battery storage system will be contained in a Conex box which will likely have interior lights to facilitate maintenance activities. These lights will not be in constant use.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(c). Signage</u></p>	<p>As shown in Site Drawings dated 12/28/2020, page DET-1, the Applicant has provided a mock-up of a sample Site Identification sign. While the content of the sign provides contact information in the event of an emergency, Beacon recommends that the Applicant or its Asset Manager/Operator provide a number that is available 24/7/365 to address emergency concerns. This is particularly important for Public Safety personnel.</p> <p>The Applicant has also indicated that signage will be installed as required for safety under state and local requirements and the National Electrical Code. These signs are expected to be attached to the 8-foot woven-wire agricultural fence and on appropriate equipment located on the concrete equipment pad.</p>
<p>11.08.03.04</p>	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(d). Utility Connections</u></p>	<p>The Applicant provided a copy of the application for interconnection of distributed generation filed with Eversource on 1/29/2019. Beacon understands that the interconnection process is an iterative process and we have requested updated documentation on 2/2/2021.</p> <p>All major equipment, including but not limited to inverters, switchgear, transformers, relays and energy storage systems will be located on the 20-foot by 40-foot concrete equipment pad.</p> <p>The Applicant will construct an 18-foot-wide permanent gravel access road at the eastern part of the parcel Map 54, Lot A8-1. The gravel access road will run north/south and merge with the</p>



		<p>existing driveway. The Applicant claims that a conduit will be constructed under the gravel access road and driveway to support medium voltage wiring from the concrete equipment pad to the point of interconnection at the driveway entrance at Pine Meadow Road.</p> <p>As shown in Site Drawings dated 12/28/2020, page SP-1, a riser pole owned by the Applicant will be installed on the driveway in addition to 2 new Eversource utility poles along the driveway spaced approximately 50 feet apart, plus one new Eversource utility pole located on Pine Meadow Road.</p> <p>The Applicant has not addressed how it will combine all electrical connections throughout Array C.</p>
11.08.03.04	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b>  <u>(e). Roads</u></p>	<p>The Applicant claims to have designed the 18-foot-wide permanent gravel access road to minimize grading by following the existing property grade. The gravel access road will be gated adjacent to the concrete equipment pad and will be otherwise fully accessible to the property owner and Public Safety personnel. The security gate will be 20-feet wide.</p>
11.08.03.04	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b>  <u>(f). Control of Vegetation</u></p>	<p>The Applicant claims, and has supported in the O&amp;M documentation, that the use of any chemicals, herbicides or pesticides within Array C will be prohibited.</p> <p>Beacon recommends that the Planning Board Condition the Special Permit by prohibiting the use of any chemicals, herbicides or pesticides within Array C and in all portions of the parcels under the Applicant’s control.</p>
11.08.03.04	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b>  <u>(g). Hazardous Materials</u></p>	<p>The Applicant claims that the only potential hazardous materials exist in the equipment located on the concrete equipment pad. Fluids contained in inverters, transformers, HVAC equipment and lithium-ion batteries are considered hazardous if released. The Applicant suggests that since these fluids are stored in self-contained vessels, risk for release is minimal. Beacon recommends that the Applicant provide detailed operations, maintenance and remedial procedures to address issues pertaining to fluid release and impact on vegetation and stormwater.</p> <p>Further, Beacon recommends that the Applicant provide more detailed information on the proposed battery storage and containment equipment, in addition to the HVAC equipment. Specifically, the Applicant should provide documentation on the fluids contained in these systems in addition to the fire suppression systems to be used.</p>

		<p>While the Applicant claims that since Array C will be remotely monitored, any mechanical failures would be detected timely. Beacon assumes the remote monitoring is provided by the Data Acquisition System which provides near real-time electric generation information as to system performance.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(5) Design and Performance Standards</b> <u>(h). Noise</u></p>	<p>The Zoning By-Law limits sound or noise levels to not greater than 50 dBA at the boundary of the property.</p> <p>The Applicant indicated that the only noise associated with Array C originates from the transformers and inverters, which have been strategically located such that the audible radius from the concrete equipment pads results on no audible impact to the boundaries of the property. Beacon notes that the battery storage facilities will be climate controlled by on-site HVAC equipment.</p> <p>Beacon recommends that the Planning Board require the Applicant to provide a noise study of the combined solar photovoltaic array equipment and associated battery storage system demonstrating dBA levels at the boundary of the property.</p>
<p><b>11.08.03.04</b></p>	<p><b>Site Plan Review</b> <b>(6) Safety and Environmental Standards</b> <u>(a). Emergency Services</u></p>	<p>The Applicant indicated that prior to making application for a Building Permit, the selected Installer will provide Public Safety officials with a project summary, a full complement of construction drawings and electrical plans. Further, prior to commissioning Array C, the selected Installer will provide training to Public Safety personnel on the operations, maintenance and de-energizing Array C.</p> <p>Beacon recommends that prior to commissioning, the Applicant should provide the Town with a Safety Manual describing the components of Array C and detailing safe de-energizing procedures of all major components including inverters, battery systems and modules. While it is not expected such detailed de-energizing procedures will be required, such information would prove beneficial in the event of a significant emergency.</p> <p>The 20-foot-wide security gate adjacent to the concrete equipment pad will be locked at all times. A Knox Box (or other option approved by the Town’s Public Safety officials) will enable emergency access.</p>

		Beacon notes that BlueWave Project Development LLC intends to sell BWC Otter Run, LLC. Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Town be noticed on any assignment, transfer or sale of BWC Otter Run, LLC.
<b>11.08.03.04</b>	<p><b>Site Plan Review</b></p> <p><b>(6) Safety and Environmental Standards</b></p> <p><u>(b). Land Clearing, Soil Erosion and Habitat Impacts</u></p>	<p>The Applicant claims that there is minimal clearing of any natural vegetation as shown in the Site Drawings dated 12/28/2020, pages EC-1 and SP-1.</p> <p>Further, the Applicant claims that soil excavation and site grading requirements are also minimal. The selected Installer will be required to comply with all soil and stormwater requirements set forth in the Stormwater Pollution Prevention Plan under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, and by the Northfield Conservation Commission. Given its proximity to the Connecticut River, Beacon recommends that the Applicant file a Notice of Intent with the Conservation Commission.</p>
<b>11.08.04.01</b>	<p><b>Monitoring, Maintenance and Reporting – Solar Photovoltaic Installation Conditions</b></p>	<p>The Applicant provided an Operations and Maintenance (O&amp;M) Plan addressing O&amp;M during construction, post construction and with respect to Stormwater Management Systems.</p> <p>To ensure adequate access for Public Safety vehicles to Array C, Beacon recommends that the Planning Board Condition the Special Permit with the requirement that the Applicant provide year-round access to the concrete equipment pad and the overall system, including providing the Town on an annual basis with adequate documentation demonstrating the provision for snow removal services on the gravel access road.</p> <p>Prior to commissioning Array C, the selected Installer will provide training to Public Safety personnel on the operations, maintenance and de-energizing Array C. The gravel access road entrance adjacent to the concrete equipment pad will be fully gated and locked at all times. A Knox Box (or other option approved by the Town’s Public Safety officials) will enable emergency access.</p>
<b>11.08.04.02</b>	<p><b>Monitoring, Maintenance and Reporting – Modifications</b></p>	<p>Beacon recommends that the Planning Board Condition the Special Permit to require that any material modifications to Array C, specifically as it relates to Array C DC capacity, battery storage, changes to the size or location of the concrete equipment pad, and/or changes to the design of the utility interconnection as shown in the Site Drawings dated 12/28/2020, page SP-1, among others, be immediately provided to the Planning Board for approval.</p>

11.08.04.03	<b>Monitoring, Maintenance and Reporting – Annual Reporting</b>	The Applicant shall be required to comply with the annual reporting requirements set forth in the Zoning By-Law.
11.08.05.01	<b>Abandonment or Decommissioning – Removal Requirements</b> (1) Physical removal (2) Disposal of waste (3) Stabilization or re-vegetation	The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc. The Decommissioning Plan included a scope of work, and labor and equipment cost for the removal of Array C and the restoration of the parcels to the original condition, excluding normal wear and tear.
11.08.05.02	<b>Abandonment or Decommissioning – Abandonment</b>	In addition to the requirements and obligations set forth in the Zoning By-Law, Beacon recommends that the Planning Board require the Applicant and property owner to address Decommissioning Requirements in its Lease agreements and provide evidence of such obligations.
11.08.06	<b>Financial Surety</b>	<p>The Applicant provided a Decommissioning Plan and Cost Estimate prepared by its consulting engineer, Field Engineering, Co., Inc. The Decommissioning Plan includes a scope of work and labor and equipment costs for the removal of Array C and the restoration of the parcels to the original condition, excluding normal wear and tear. The cost estimate includes an approximate 2.45 percent annual increase to account for inflation.</p> <p>Beacon notes that given the size of Array C, the estimated total cost in 2020 dollars likely understates the magnitude of the effort by a factor of 2. Beacon recommends that the Planning Board request the Applicant to reconsider its projected cost estimate and provide supporting documentation of actual decommissioning costs for projects owned by the Applicant of similar size.</p> <p>Beacon recommends that the form of Financial Surety be an annual renewing irrevocable Bond with the Town of Northfield as the named bond holder.</p>

On a personal note, we very much appreciate the opportunity to support the Northfield Planning Board in its review of these Large-Scale Ground-Mounted Solar Photovoltaic systems. If you have any questions or need additional information, please do not hesitate to contact me directly at 617-469-2172.

Best regards,

*Beth S. Greenblatt*

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