BRANCH
RENEWABLE ENERGY

12/28/21

Ryan Keith
Code Enforcement Officer
Town of North Yarmouth
10 Village Square Road
North Yarmouth, ME 04097

**RE: Community Solar Project Pre-Application Request**

Ryan,

Thank you for meeting with me last week to discuss the permitting process for the proposed community solar Project on Sweetser Road. It was very helpful to review the Site Plan Review and Conditional Use Application, and how to best work with the town the during the permitting process. In order to begin the first steps of the Site Plan Review process, I'd like to attend the February Planning Board meeting to have a pre-application review of the project. Attached in this packet is a preliminary site plan that shows the proposed placement of the Project equipment (Attachment 1).

The Project is located on Map 5, Lot 2, and the physical address is 238 Sweetser Road, North Yarmouth, ME 04097. The landowner is the Yarmouth Water District, and I have an Option Agreement executed with them to lease a portion of their land to construct a community solar project.

To date a natural resources delineation has been performed, and we have initiated agency consultation with the Maine Natural Areas Program and the Maine Department of Inland Fisheries and Wildlife. An interconnection application with CMP has also been filed, and the Project has been accepted in the interconnection queue where is it currently being reviewed by CMP's engineering team. The Project will connect directly into the existing 3-phase electrical lines that run through the center of the parcel.

I've included a general summary of the recent change to Maine's solar policies as well as an overview of how solar projects are constructed and maintained (Attachment 2). This should provide a helpful primer prior to the pre-application meeting with the planning board.

I look forward to talking more, and please let me know if there is anything else that I can provide in the meantime.

Sincerely,

Chris Byers
Principal
Branch Renewable Energy
cbyers@branchrenewables.com

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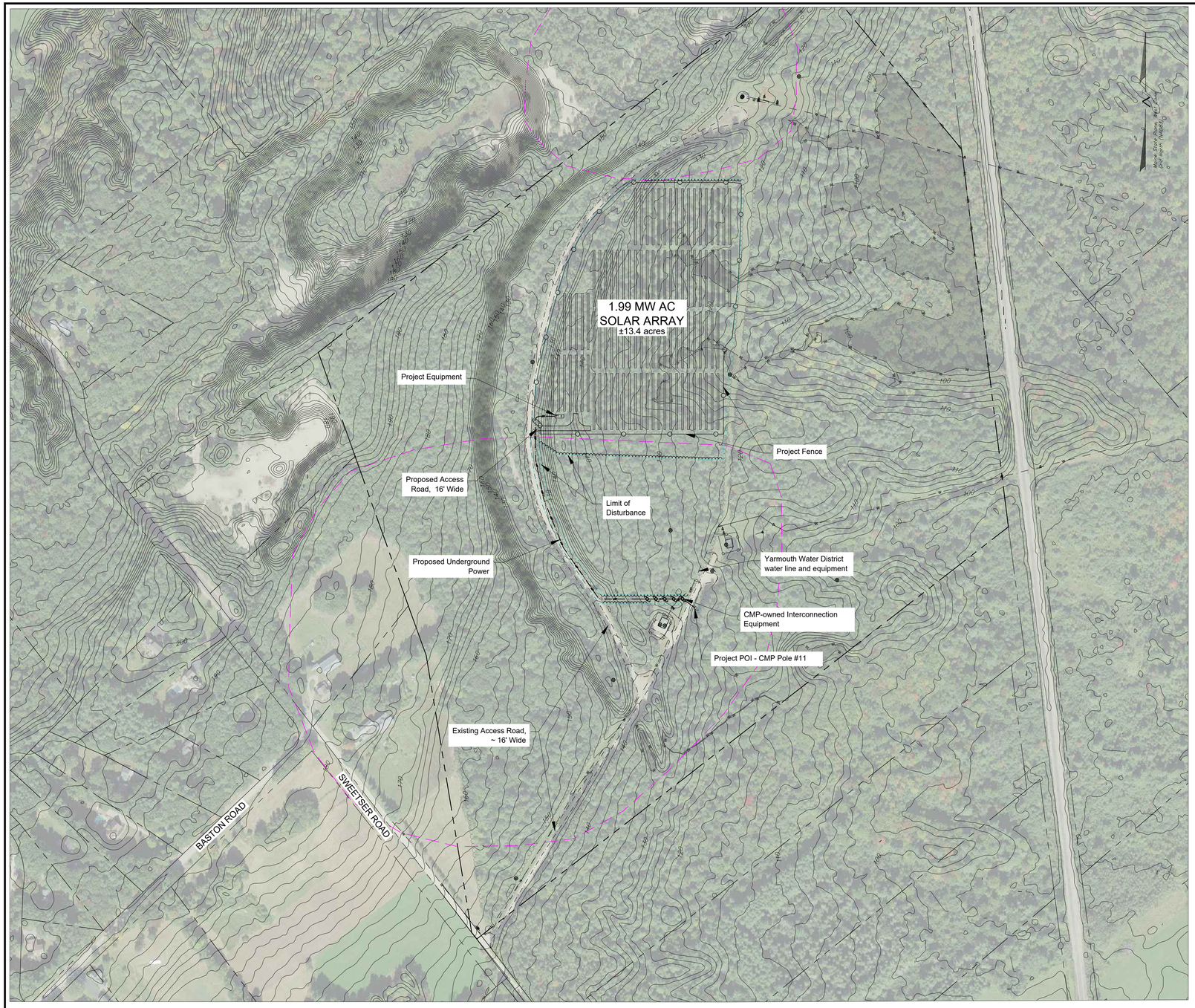
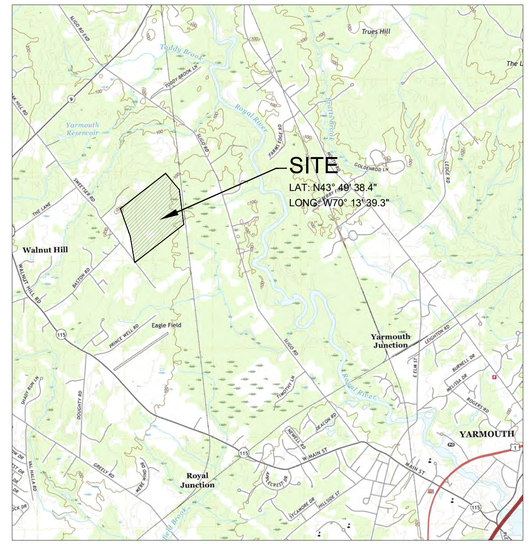
# Attachment 1

# Preliminary Site Plan



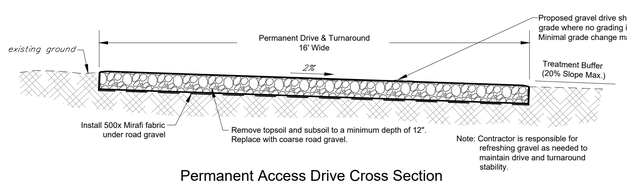

## LEGEND

- EXISTING POWER POLE / PROPOSED POLE
- APPROXIMATE PROPERTY LINES
- APPROXIMATE PROJECT PARCEL
- EXISTING GRADE CONTOUR LINES (5 FOOT INTERVALS)
- EXISTING TREELINE
- PROPOSED PROJECT FENCE
- PROPOSED TREELINE
- EXISTING OVERHEAD POWER
- PROPOSED OVERHEAD POWER
- PROPOSED UNDERGROUND POWER
- PROPOSED PROJECT EQUIPMENT
- PROPOSED TRACKER UNIT SOLAR PANEL RACKING
- DELINEATED STREAM
- ENVIRONMENTAL RESOURCE BUFFER
- DELINEATED WETLAND
- PROPOSED 16' GRAVEL ACCESS DRIVE
- EXISTING GRAVEL ACCESS DRIVE
- LIMIT OF DISTURBANCE
- EXISTING FENCE
- EXISTING YARMOUTH WATER DEPARTMENT WELL
- EXISTING YARMOUTH WATER DEPARTMENT WATER VALVE
- EXISTING YARMOUTH WATER DEPARTMENT HYDRANT
- EXISTING YARMOUTH WATER DEPARTMENT WATER LINE
- 200-DAY WELL PROTECTION AREA

PRELIMINARY SOLAR ARRAY
DESIGN INFORMATION:
2.36 MW DC
1.99 MW AC
DC/AC = 1.18
5,238 MODULES
450W PHOTOVOLTAIC MODULES
LOD = 13.36 ACRES
GCR = 0.32
Pitch = 20.0'
Inter-row Spacing = 13.65'

## NOTES:

1. ASPECTS OF PLAN ARE APPROXIMATE AND DERIVED FROM AERIAL PHOTOGRAPHY.
2. THE HORIZONTAL COORDINATE SYSTEM IS BASED ON NAD83 MAINE STATE PLANES, EAST ZONE (US SURVEY FEET). ELEVATIONS ARE BASED ON THE NAVD88 (US SURVEY FEET).
3. EXISTING GROUND CONTOUR ELEVATIONS ARE BASED ON LIDAR DATA DOWNLOADED FROM NOAA DATAVIEWER IN OCTOBER, 2021.
4. UTILITIES ARE NOT WARRANTED TO BE COMPLETE OR ACCURATE, CONTRACTOR SHALL CONTACT DIG SAFE BEFORE BEGINNING ANY EXCAVATION.
5. THIS IS IN NO WAY A BOUNDARY SURVEY. PROPERTY LINES SHOWN ARE FROM TOWN TAX MAPS
6. THIS IS PRELIMINARY DESIGN PLAN. FINAL DESIGN WILL BE MODIFIED TO MATCH EQUIPMENT PURCHASED.
7. ENVIRONMENTAL SITE REVIEW DATA IS BASED ON DATA FROM BRI ENVIRONMENTAL .




Permanent Access Drive Cross Section

# NORTH YARMOUTH SOLAR

North Yarmouth, Maine

BRANCH RENEWABLE ENERGY

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Colchester, Vermont 05446
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CIVIL DESIGN SET
FOR PERMIT REVIEW

MAPPING SOURCE DATA USED FOR PLAN COMPILATION

Civil Engineering:
Krebs and Lansing Consulting Engineers, Inc.
164 Main Street, Suite 201
Colchester, Vermont 05446

Environmental:
BRI Environmental
30 Danforth Street, Suite 213
Portland, ME 04101

0' 180' 360' 540'
0" 1" 2" 3"
STANDARD GRAPHIC SCALE (1" = 180')
VALID WHEN PLOTTED ON 24" BY 36" MEDIA

DRAFT

| REV. NO. | REVISIONS /COMMENTS | DATE |
|---|---|---|
| | | |

DRAWING TITLE:
NORTH YARMOUTH SOLAR
SINGLE AXIS TRACKER
SITE PLAN

DATE of Issue: 12/21/2021

Drawn by: RTR Checked by: EJM

Project No.: 21388 Scale: 1" = 180'

Drawing No.: C-1.0

Rev No.:

BRANCH
RENEWABLE ENERGY

# Attachment 2

# Maine Solar Project Introduction

# Maine Solar Project Introduction

## Maine Solar Policy and Permitting

During the last legislative session, a diverse group of businesses, towns, and clean energy advocates advanced LD 1711 and LD 1494 to establish regulatory predictability for the solar industry and the use of competitive markets to reduce energy costs for Mainers. The bills, as signed into law by the Governor Mills, are designed to increase the amount of solar energy required to power the State, and to maximize benefits to ratepayers that make it easier to invest in solar, especially for commercial and municipal energy consumers.

The law has broad support from organizations across the state as diverse as the Maine Municipal Association, Associated General Contractors, and the Environmental Priorities Coalition.

Solar projects have been successfully sited and permitted throughout Maine. Some municipalities are actively encouraging solar developers to site projects in their communities, including the nearby town of Sanford. Solar projects are very low impact in nature and are not considered impervious by the Maine Department of Environmental Protection {DEP). The racking consists of steel piles driven into the ground and ballasted foundations are not typically required. When the useful life of the project ends, it is decommissioned and the site is returned to its natural state. The site would be suitable for other uses and does not carry any permanent impact or alteration of the land.

## City of Sanford: Success Story

The City of Sanford has been actively leasing land owned by the City to solar developers for the purpose of developing large scale solar farms, similar to this proposed project.

The City actively participated in the development and permitting of a 50 MW facility at the town airport and the community has embraced solar throughout the development process. The benefit to the city has been so strong that the City of Sanford is actively soliciting developers to move into their municipality to and increase its solar capacity. Steven Buck, the Sanford City Manager, has been a champion of these developments and is actively spreading the word about his positive solar industry experience. Steve can be reached at 207-324-9173.

## Solar Industry Background

Solar technology isn't a new phenomenon; in fact, it has been around in niche markets for the better part of 50 years. Historically, solar customers mounted solar modules on their off-grid cabins connected to batteries in order to power small electrical loads; the technology was expensive, and difficult to scale. The benefit wasn't saving on an electric bill, it was having power that was renewable and didn't require the use of a generator. Night time electrical use was limited to the energy stored in batteries, and one hoped that there was enough sun the next day to re-charge the batteries. Today, a lot of people in Maine have these kinds of systems installed at remote cabins, and because they are far from the grid, these systems are still a reliable means of powering simple electrical loads.

In 2009, Maine approved a new program called net metering, and to this day that program is what helped to fuel the growth of the solar industry in our State. Net metering allows residents, businesses, municipalities, schools, etc. to install a solar energy system and connect it to the existing grid infrastructure in their building that ultimately has the ability to back feed into the grid. In this sort of system, there are no expensive batteries; in fact, the grid acts like the battery. If the solar energy system produces more energy than the building loads consume during the daytime hours, the meter will "spin backwards" and provide that ratepayer a credit to be consumed when the sun goes down. Over the course of a month, the meter will spin forward and backward each day, thus creating a net metered bill at the end of the month.

Net metering customers often seek to produce as much solar power as they consume over the entire year, and this is where the term, "net-zero" comes from: energy produced by solar is equal to energy consumed. Ideally, net zero customers pay $0 for their energy supply and distribution over the course of the year.

While individual residential net metered solar projects have become more popular in Maine and the rest of the US, utility-scale virtual net metered community solar projects are becoming increasingly popular for residential, business, municipal, and governmental customers to realize cost savings from solar energy projects without installing solar on their building or property.

Community solar projects are large-scale projects built on a single site, and consumers engage in a power purchase agreement (PPA) with the owner of that solar project to purchase discounted, clean energy. As solar energy is back fed directly into the grid, the utility will apply a credit to each community solar subscriber's monthly bill, and in exchange for that credit, the subscriber pays the solar project owner a rate that is less than what would have been paid to the utility. Subscribers typically invest $0 to participate in the program, and they don't have to put solar modules on their roof or take up valuable land on their property. Economies of scale realized in the development and construction of a large-scale solar power projects make it possible for each subscriber to benefit from their collective bulk buying power; in simple terms without the subscriber group, the project doesn't happen. The only restriction to which people or entities can participate in a community solar project is that their building or electric meter must be in the same utility territory as the community solar project itself.

Terms for PPAs can range from 1-20 years, and rates can be pre-set over the term of the agreement. The low barrier of entry for subscribers is an obvious benefit, but municipalities especially appreciate these agreements because a long-term PPA offers predictable, future costs of energy which provides confidence in creating more accurate (and already tight) budgets.

As the Maine solar industry rapidly evolves, most importantly we expect these new and exciting programs to have a direct financial benefit to those all over the State of Maine.

## Solar Project Construction and Maintenance

Solar projects can be reasonably constructed year-round, even in New England. While summer conditions are ideal, the nature of constructing large, utility-scale projects over many months is that they end up being built in all conditions and all seasons. Projects are designed by a team of civil, electrical, and structural engineers, and stamped drawings are a standard as with most projects. Each municipality may have unique requirements, and each project will vary in its level of detail and complexity, but in Maine there are solar specific code standards required for these projects, especially on the electrical side that need to conform to NEC 2018.

Depending on the size of projects, the timeline of construction from breaking ground to final commissioning can vary greatly. A simple metric used in the solar industry is ~1 MW built per month.

To put that formula in context, a ~5 MW project construction timeline would be approximately 5 months. Schedules are better defined once a construction plan is established for a project.

Standard civil and stormwater designs are created for these projects, and it's common to see silt fence, and filter socks used to control runoff throughout the project. Detention basins are very uncommon on solar projects, and the project proposed by our firm would not include that feature in the design. The reason detention basins are not designed into large ground mounted, utility-scale solar projects is because the Maine Department of Environmental Protection (MDEP) prefers vegetated buffers to treat stormwater. Solar modules are not considered impervious surfaces and the meadow below the modules would be wholly capable of treating an infiltrating more stormwater than the site would ever create.

Solar modules are mounted on galvanized steel racking, commonly supported by steel 6x9 I-beams driven into the ground by a vibratory machine. The embedment depth of the steel posts depends on the geotechnical survey, frost depths, wind loading, etc., but is commonly embedded into the ground 6-8' in northern New England. The final height of the racking with the solar modules installed is around 10', and the bottom edge of the solar modules is ~3ft off the ground so that snow can slide off the modules and not build up to block the sun from hitting the solar modules during the winter months. This 3ft height also allows for vegetation maintenance.

The solar panels connect to inverters, which is a device that changes the DC power created by the solar panel to AC power so that it can be injected onto the grid. Inverters have a small hum noticeable when you are within close range, but do not create nuisance noise outside the project area. The project will be compliant with day and nighttime decibel limits set by MDEP.

A transformer and protective switch gear cabinet connect the inverters to the medium voltage conductors that run to the grid. Sometimes more than one transformer is installed on the project, and the size of the transformer(s) is similar to what would be seen outside a commercial building. The transformer(s) also do not create nuisance noise outside the project area, and are compliant with day and nighttime decibel limits set by MDEP.

From the transformer, medium voltage conductors connecting to the grid are placed on standard overhead power poles, and any protective equipment such as a manual air break switch or recloser are installed on those poles by the utility based on the utilities' approved interconnection scheme.

Fencing is installed around the perimeter of the solar racking and equipment pads. While chain link is found on many projects, our firm prefers a more aesthetically pleasing agricultural fence often used to keep deer out of a field. The fence has a graduated mesh profile whereby the squares towards the bottom of the 7-8 ft fence become smaller and allow smaller animals to pass through the fence along the ground. We prefer the agricultural fence style because it blends with in well with New England, and fits with the purpose of "harvesting" the sun on the solar farm.

## Operations and Maintenance

Solar projects are maintained post-construction. Routine checks are performed to verify equipment is in proper working condition. A technician in a pickup truck might come by the site four times over the course of the year, and then outside of that visit, 24/7 monitoring is performed by analyzing data from a sophisticated, on-site monitoring system that sends periodic updates via an on-site cell modem. The monitoring system also allows troubleshooting remotely (ex. Power cycling an inverter) so that a technician does not have to be mobilized to the site. Vegetation management would occur no more than twice a year so that vegetation can be established as meadow buffer.