



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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VIA ELECTRONIC MAIL

March 7, 2019

Paul R. Michaud, Esq.
Michaud Law Group LLC
515 Centerpoint Drive, Suite 502
Middletown, CT 06457

RE: **PETITION NO. 1312** – Candlewood Solar LLC declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed construction, maintenance and operation of a 20 megawatt AC (26.5 megawatt DC) solar photovoltaic electric generating facility located on a 163 acre parcel at 197 Candlewood Mountain Road and associated electrical interconnection to Eversource Energy's Rocky River Substation on Kent Road in New Milford, Connecticut. **Development and Management Plan.**

Dear Attorney Michaud:

The Connecticut Siting Council (Council) requests your responses to the enclosed questions no later than March 21, 2019. To help expedite the Council's review, please file individual responses as soon as they are available.

Please forward an original and 15 copies to this office, as well as a copy via electronic mail. In accordance with the State Solid Waste Management Plan, the Council is requesting that all filings be submitted on recyclable paper, primarily regular weight white office paper. Please avoid using heavy stock paper, colored paper, and metal or plastic binders and separators. Fewer copies of bulk material may be provided as appropriate.

Any request for an extension of time to submit responses to interrogatories shall be submitted to the Council in writing pursuant to §16-50j-22a of the Regulations of Connecticut State Agencies.

Sincerely,

Melanie A. Bachman
Executive Director

MB/MP/lf

c: James J. Walker, Vice President, Ameresco, Inc.
Joel S. Lindsay, Director, Ameresco, Inc.
Council Members

Attachment: Affidavit of Milone & MacBroom, Inc.

Petition No. 1312
Development and Management Plan
Interrogatories to Candlewood Solar, LLC
Set Two

5. Please respond directly to the comments in the February 26, 2019 Milone & MacBroom, Inc. Affidavit that was submitted by the Town of New Milford in Petition 1362. A copy of the Affidavit is attached.
6. Page 8 of the Development and Management Plan (D&M Plan) dated January 28, 2019 notes that Candlewood Solar, LLC (Candlewood) is “working with DEEP NDDB on a potential modification to the tree-clearing window.” What is the status of such potential modification? Is such modification expected to deviate from the originally proposed November 1 through March 30 window?
7. In response to Connecticut Siting Council (Council) D&M Plan interrogatory response number two, Candlewood notes that, “Should the schedule require it, additional work may be performed on Saturdays.” However, page 4 of the D&M Plan notes that work hours could occur potentially outside of the standard hours due to working on the electric power system (interconnection), or for other operations due to the nature and scope. Accordingly, could there potentially be any Sunday or nighttime construction hours under such circumstances?
8. Was the property owner consulted regarding the Decommissioning Plan? Would the Decommissioning Plan in any way conflict with the lease option agreement (or other agreement as applicable) with the property owner? Are there any provisions in the lease option agreement with the property owner related to site restoration at the end of the project’s useful life? If so, please provide any such provisions.
9. Provide the approximate final length of the interconnection line (in linear miles) beginning at the solar facility and ending at the last pole to be owned or controlled by Candlewood.
10. Referencing Section 2.8 (Compliance with DEEP “Stormwater Management at Solar Farm Construction Projects), are there any guidelines in the document that Candlewood would not be able to comply with? Explain.
11. Referencing Section 2.13 (Final Wildlife Protection Measures and Seasonal Restrictions), page 10, Candlewood notes that, “Updates on Candlewood Solar’s consultation with DEEP NDDB regarding the preconstruction survey and tree clearing will be provided separately to the CSC.” Are there any updates at this time? If yes, provide a copy of such updates.

- 3.2 Adequacy of the Erosion and Sedimentation Control Plan included in Appendix B and described further in the Stormwater Pollution Control Plan (Appendix D) for consistency with the Connecticut Department of Energy & Environmental Protection (CTDEEP) *2002 Connecticut Guidelines for Erosion and Sedimentation Control* including but not limited to seeding the site for stabilization purposes prior to installation of racking systems and panels
 - 3.3 Consistency of the Stormwater Management Plan with the CTDEEP *2004 Connecticut Stormwater Quality Manual*, including an analysis on the potential impact of driveways on stormwater flows including but not limited to potential diversion of stormwater away from wetlands
 - 3.4 Adequacy of the site clearing, grubbing, stabilization, and stormwater controls phasing plan
 - 3.5 The consistency of the plans with the recommendations from CTDEEP outlined in "Stormwater Management at Solar Farm Construction Projects" dated September 8, 2017
4. The Candlewood Solar project will be constructed on a large site. The portion of the site where construction is proposed has steep slopes that average 10% to 15% with some slopes as steep as 25%. The underlying soils are compact upland soil formed over glacial till, typical of what is found on the hillsides elsewhere in New Milford. The soil infiltration rates for these soils are classified by the Natural Resources Conservation Service as being slow to very slow. They are also prone to erosion due to being fine grained. There are several special wetlands on the property including three vernal pools as well as state special concern and threatened amphibians that are sensitive to water quality impacts. There are no construction activities proposed directly in the wetlands, but there are activities in the upland review area that could impact/impair water quality. Except for a small area of hayfields, construction will occur in wooded areas of the property. Overall, approximately 83 acres will be disturbed, and approximately 54 acres of core forest land will be clear-cut to allow for the installation of the solar array and the transmission line connecting to the Rocky River substation east of the site.
5. The plans submitted to the CSC as part of the D&M Plan are represented as being "For Construction." The plans are not suitable for construction, in our opinion, because they lack detail specific to the conditions on this subject site, are not adequate to allow a responsible contractor to implement the improvements in the field, and allow CSC to verify that the improvements have been constructed in accordance with the approved plans. Note the following:
 - 5.1 Based on our experience with the design of similar facilities, it is customary engineering practice to provide site layout plans with appropriate dimensions showing the precise limits of clearing and the location of all improvements, grading plans having 2-foot contour intervals showing existing and proposed finished grades including what will be beneath the solar arrays, and detailed drainage plans showing the precise slope sizes and inverts of pipes and other structures. This information is

in addition to the required Erosion and Sedimentation Control Plans. Without having refined plans, the impacts of the proposed development cannot be adequately assessed.

- 5.2 The project calls for the clearing and grubbing of the site in order to install the solar arrays, access drives, and other related facilities. However, except for some drainage swales and other drainage improvements located on the perimeter of the disturbed site (83.4 acres), there are no grading plans that show how the topography will be regraded once the existing vegetation and stumps have been removed and prior to restoration and the implementation of site improvements.
 - 5.3 The site construction details included in the plans are generic, accompanied by standard tables. The critical details related to drainage structures have not been customized to be applied to this site and rely on field interpretation during construction.
 - 5.4 In reviewing other solar installations and based on our experience, the ratio between the panels and the space between arrays should be approximately 50/50 to facilitate adequate maintenance and provide for sunlight for the vegetation to grow beneath the panels. The plans show that the solar arrays are separated by aisles having a width as narrow as 5 feet, which is too narrow to allow maintenance and promote a healthy vegetative community. Moreover, it will cause the vegetation in the aisles and beneath the panels to be shaded, thus affecting the long-term sustainability and quality of the vegetation.
6. The stormwater analysis presented by the applicant is fundamentally flawed as noted below:
- 6.1 The plans are based on outdated rainfall data. Both CTDEEP and the Connecticut Department of Transportation (CTDOT) require the use of rainfall precipitation data from National Oceanic and Atmospheric Administration (NOAA) Atlas 14, not TP-40. (See Appendix B in Chapter 6 of the *2000 DOT Drainage Manual*, as undated on the DOT webpage, now referencing NOAA Atlas 14 Volume 10.) The NOAA Atlas 14 rainfall data is 15% to 20% higher than the old data in TP-40 and would have a significant impact on the outcome of the modeling and the actual design.
 - 6.2 The *HydroCAD* model output provided in the Stormwater Pollution Control Plan indicates the use of infiltration in the design of the proposed sand filters. However, it does not appear that in-situ soil testing has been performed to determine if surface sand filters are an acceptable stormwater practice for the site.
 - 6.3 The CTDEEP *Stormwater Quality Manual* provides guidelines for stormwater filtering practices that have not been followed in the proposed design. The manual states that filtering practices are designed as offline systems to treat the water quality volume and bypass larger flows. Also, the manual recommends the Water Quality Volume should be diverted into a pretreatment sediment forebay or settling chamber

to reduce the amount of sediment that reaches the filter. (See Filtering Practices in Chapter 11 of the *2004 DEEP Water Quality Manual*, page 11-P4-1) The proposed design directs all of the runoff to the surface sand filter with no pretreatment. The manual contains a list of the limitations of stormwater filters that pertain to the proposed design: 1) Pretreatment is required to prevent filter media from clogging; 2) Frequent maintenance is required; 3) Surface sand filters are not feasible in areas of high groundwater; 4) Surface sand filters should not be used in areas of heavy sediment loads; 5) Surface sand filters provide little or no stormwater quantity control; and 6) Surface and perimeter filters may be susceptible to freezing. The design of the proposed stormwater management needs to be designed with greater attention to site conditions.

- 6.4 It is appropriate to assume a meadow coverage condition for the proposed conditions *HydroCAD* model only if continuous vegetation is permanently established and maintained under the solar panels. However, it is expected that the new vegetation will struggle to grow under the panels due to the density, size, and short height of the panels in relation to the ground. The only possible portion of the site where the arrays are proposed that could have a continuous meadow coverage would be the open space in between the panel rows that are illustrated to be as narrow as 5 feet. The hydrologic computations need to be revised to assume a poorer ground coverage under the proposed solar panels. This is likely to result in the need for stormwater detention that is not part of the plans as now presented.
- 6.5 The postdevelopment peak discharge rates for Points of Analysis 5 and 6 show an increase from the predevelopment conditions. A technical explanation as to why these increases will not cause negative impacts downstream has not been provided.
- 6.6 At present, much of the runoff from the western portion of the site that drains to abutting properties to the west does so in an even, shallow, concentrated flow. The introduction of the spillway outlets will result in runoff being consolidated and concentrated in a few distinct locations. This will fundamentally change the nature of the discharge from the subject parcels and could result in long-term risk of erosion and damage to downgradient parcels. This condition also exists on the eastern side of the parcel where runoff is concentrated and not spread out in a manner more consistent with existing conditions.
- 6.7 Design computations for the drainage swales and culverts have not been provided to demonstrate that they are adequately sized to convey the contributing stormwater runoff.
- 6.8 There are no supporting calculations demonstrating the velocity of runoff that is expected at the outlets of the basins.
- 6.9 The use of sheet flow in the time of concentration calculations where solar panels are proposed is not a reasonable expectation given the concentrated nature of the runoff

from the panels themselves. The runoff generated from the drip line of the panels will travel downgradient in a manner more consistent with shallow, concentrated flow.

- 6.10 The grading of the driveway from Candlewood Mountain includes riprap swales along both sides of the road, with runoff directed to sand filter 7C. The uphill swale appears to simply discharge across the driveway to the sand filter. The uphill swale in particular is likely to convey significant flows that will cause erosion across the driveway in an unprotected manner. Also, there does not appear to be any supporting calculations on the design of the roadside or other swales on site.
- 6.11 The roadway swales ultimately discharge into two 18-inch culverts beneath the driveway that will channelize the flow and result in point discharges that currently do not occur on site. Also, the 18-inch culvert along the road is shown within the town right-of-way, requiring approval from the New Milford Public Works Department. Calculations for the 18-inch culverts have not been provided.
- 6.12 The riprap spillway depth is not specified for the sand filter details. Assuming that the outflow from the spillway is calculated to begin at the crest and not the bottom of the riprap, the basins will begin to drain at the interface between the earth embankment and the bottom of the riprap, significantly reducing the effective storage within the basins.
- 6.13 The berms of the sand filters are shown at a 2:1 slope. Recommended slopes on constructed berms generally require an average slope of 2.5 between the inside and outside slopes of the berm.
- 6.14 Sand filter 7C does not include a berm as shown in the calculations and merely drains from elevation 726 to 724.
- 6.15 The plans call for a narrow sand filter strip within the bottom of some sand filter basins. The soil media should be placed within the entire bottom of the sand filters.
- 6.16 Water quality basins 2A, 2B, 4A, and 4B are proposed on existing grades approaching 25%, resulting in significant grading along the property line. These basins need to be relocated upgradient to flatter existing slopes that are more suitable for construction of stormwater control features.
- 6.17 Portions of the site grading, drainage, and site improvements are shown directly against property lines and the town right-of-way. The submitted documents indicate that the property lines are based on tax maps and not based on surveyed property lines. Assessor's mapping is approximate and should not be used as a basis for design of construction plans particularly when activity is proposed right up to a property line. An A-2 boundary survey should have been completed prior to submission of the Stormwater General Permit application.

- 6.18 The grading plan for basin 1A requires the installation of a constructed berm that will impound stormwater up to a couple feet in depth beneath portions of the solar panels. Based on the limited area of sand filter that is shown only in a small portion of the area impounded by the basin nearest to the eastern berm, extended periods of standing water may exist beneath panels after a rainstorm.
7. The phasing plan described in the Stormwater Pollution Control Plan (Appendix D) is simplistic and does not adequately address the potential erosion and sedimentation that should be anticipated from the disturbance of 83.4 acres (see Section 2.1 in the Stormwater Pollution Control Plan) on a steep hillside. Note the following:
- 7.1 The plans do not clearly show how no more than 5 acres at a time will be disturbed before stabilization and prior to the installation of the panels.
- 7.2 The plan states that the solar array will be installed after vegetative cover is "initiated," but there is no metric for determining when the soil has been stabilized.
- 7.3 The plans call for the clear-cutting of trees as one continuous operation, leaving the stumps in place. Such forest operations can cause soil erosion, but the applicant is not proposing to install erosion control measures until after the clearing operation is finished.
- 7.4 The second phase of the operation calls for the grubbing (removal of stumps) to be done in 5-acre increments, but the locations of those "plots" have not been clearly defined; this will be left to field survey at the time of construction. Furthermore, the method of grubbing has not been presented. If not performed with appropriate equipment, there is likely to be a loss of topsoil and an increase in the potential for erosion on the steep slopes. It appears from the plans that it is the applicant's intention to perform the operations in a continuum rather than in discrete and separate disturbance plots that will allow for separation of the disturbed areas and for vegetation to become established.
- 7.5 Temporary seeding is proposed in areas that will be disturbed by subsequent construction activity with permanent seeding occurring at a later time. It is not clear how, when, and where permanent seeding will occur.
- 7.6 It is not appropriate to assume that once germination occurs that the land is stabilized and the 5-acre phase is ready for the installation of foundations. It is our experience on sites where grass needs to be established prior to having activity on the site that it takes a substantial period of time before sod becomes adequately established. Permanent seed, which should include drought- and shade-tolerant species, takes 3 weeks or so to germinate and takes months, not weeks, to develop a root system that can withstand traffic. The actual time for turf establishment depends on the time of year that seed is placed, temperature, and moisture. The turf

needs to be mowed to promote density. In this instance, we would expect a full growing season for the grass to become fully established.

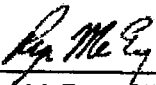
- 7.7 As described in the plan, the foundations for the solar arrays will be ground screws that, in our experience, are installed using a skid-steer vehicle (a Bobcat). The movement of such equipment will tear apart the grass, likely resulting in erosion unless the grass is fully established.
- 7.8 The phasing plan attempts to break up the stabilization and construction of the site based on contributing watersheds. This does not seem to be a practical means to construct the improvements, particularly given the potential of subwatersheds being changed or modified as a result of ongoing construction activities. Sediment control measures including sediment traps and diversion swales should be installed and in place in phases immediately adjacent to phases that are under active construction to ensure that downgradient protections are in place should the topography not precisely match what is shown on the plans or if construction activities divert runoff across the estimated watershed limits.
- 7.9 The temporary sediment traps (TST) are shown on the plans in the identical manner that sand filter/water quality basins are shown. The supporting calculations shown on the details sheets include bottom elevations of the TSTs that are up to 3 feet below the *bottom* of the sand filter, well below the finished grade. The sediment and erosion control plans should reflect the grading of the TSTs shown in the supporting calculations.
- 7.10 Long slopes several hundred feet in length (as much as 700 feet) with average slopes exceeding 10% of disturbed, exposed soil are proposed prior to any sediment control measures. Unprotected long and steep slopes represent a significantly high risk of erosion. Long, steep slopes are required to be broken up by benching, terracing, or diversions to avoid erosion problems (pages 3 through 7 of the *2002 Connecticut Guidelines for Erosion and Sediment Control*). Detailed site grading plans should be provided to show these site modifications.
- 7.11 The sediment barrier shown on the perimeter of the site will channelize and direct runoff to the low points along the slope, concentrating runoff from sediment trap outlets. The sediment barrier/silt fence locations need to be placed in a manner that will not result in channelizing the discharge from the basins.
- 7.12 Soil stockpile locations are not shown.
- 7.13 Much of the clearing and installation of overhead wires occurs on a slope that exceeds 25% in grade. While the activities proposed in that area are intended to be minor in nature, disturbed soil on a slope this steep will require temporary diversions and at least temporary erosion control matting to allow for vegetation to become established.

- 7.14 There are no long-term stabilization measures shown along the drip line of the panels. Particularly in areas exceeding 10% in grade, there exists the potential for erosion of the soil, which over time will result in increased sediment loads to downgradient areas.
8. The document prepared by CTDEEP entitled *Stormwater Management at Solar Farm Construction Projects* includes clarification on procedure, design goals, and construction monitoring requirements that reiterate the goals of design documents referenced in Comment 3 above. The submitted documents fail to adhere to the recommendations of CTDEEP guidelines as noted below:
 - 8.1 The CTDEEP document requires that the methods of *"an approvable SWPCP will include methods for avoiding compaction of soils, disconnection of and reduction of runoff..., avoidance of concentration of stormwater, and other measures necessary to maintain or improve pre-construction hydrology conditions."* For the reasons stated in Comment 6, it is our opinion that the postconstruction hydrology will degrade and exacerbate preconstruction hydrology.
 - 8.2 The CTDEEP document requires that the design professional be well versed in erosion and sedimentation guidelines, particularly Chapter 4 for large construction sites. For the reasons we stated in Comment 7, the D&M Plan does not meet these criteria.
 - 8.3 The document states *"an approvable SWPCP shall include, but not be limited to, the location of all erosion, sediment and stormwater control measures including detailed design cut sheets with supporting calculations, construction means and methods, project phasing (i.e. site planning pre-construction, construction, and post-construction stabilization, etc.), construction sequencing and a construction schedule."* For the reasons stated in Comment 7, the phasing plan lacks sufficient detail, and the timing of construction activities will result in large tracts of disturbed land with a lack of mature vegetation needed to limit the potential for transport of sediment during construction.
 9. In summary, the plans submitted to the CSC as part of the D&M Plan are inadequate and lack the necessary information to assure that there will not be erosion and sedimentation caused by the construction activities that could impact the waters of the stated as noted below:
 - 9.1 Contrary to representations made by the petitioner, the hydrology of the site will be permanently altered and will impact adjoining properties.
 - 9.2 The Candlewood Solar project should be distinguished from other projects that come before the CSC. Whereas transmission line projects, for example, disturb land in a linear manner where impacts from erosion and sedimentation are manageable and stabilization can occur quickly, the Candlewood Solar project will require the clearing,

grubbing, and regrading of a large block of land on steep slopes where it will be difficult to manage impacts.

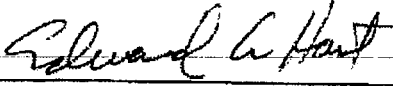
- 9.3 The establishment of grass cover adequate to prevent long-term erosion will require regrading of the site prior to seeding. The time that it will take to achieve well-established grass should be measured in months, not weeks. By developing the site in "rolling" 5-acre increments without establishing thick turf before installing the solar arrays is highly likely to cause both short-term and long-term erosion and sedimentation.
- 9.4 The density of the solar arrays will severely restrict sunlight to the grass beneath the panels and make it very difficult to maintain the grass that will allow for its long-term health.
- 9.5 If the CSC requires the petitioner to modify and resubmit the plan and supporting documents in accordance with the foregoing comments, it is quite possible that the configuration of the solar arrays will need to be modified and further reduced in number.

MILONE & MACBROOM, INC.



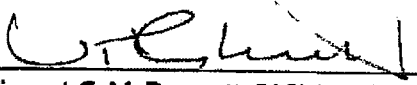
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Feb. 26. 2019
Date