

# Erosion and Sediment Control Plan

Candlewood Solar  
New Milford, Connecticut

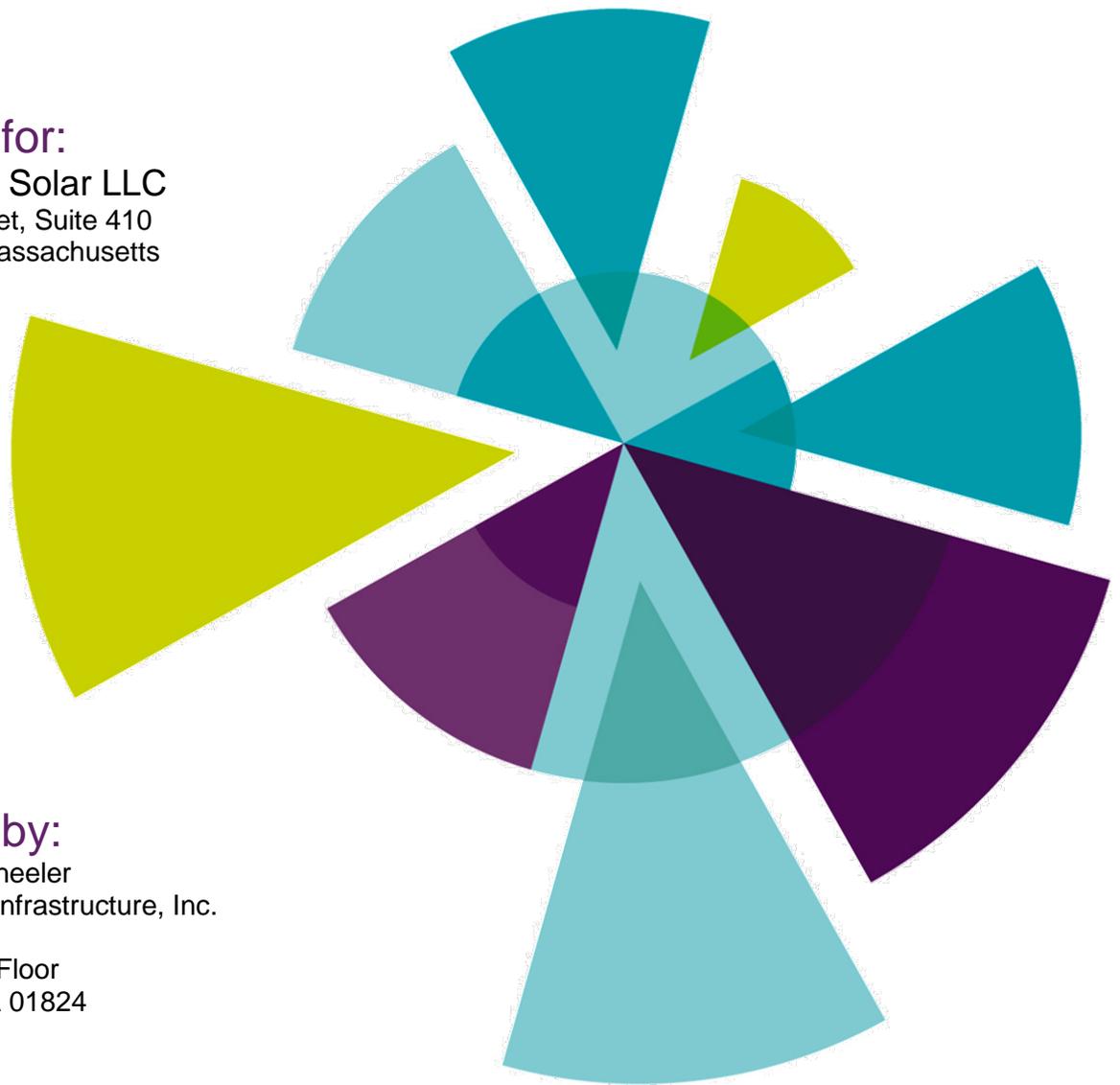
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## FIGURE

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Figure 1 - Site Locus Map

## APPENDICES

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Appendix A - Supporting Documents

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## **1.0 INTRODUCTION**

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) has prepared this Erosion and Sediment (E&S) Control Plan on behalf of Candlewood Solar LLC (Candlewood Solar) for the proposed installation of a 20 megawatt (MW) AC (MWac), solar photovoltaic (PV) electric generating facility (the Facility) in the Town of New Milford, Connecticut (the Project). This E&S Control Plan has been prepared in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

### **1.1 Project Area**

The Project will be located on portions of three (3) parcels to accommodate the proposed solar PV array, access road, and electric interconnection route (New Milford Assessor Map parcels 26/67.1, 9/6, and 34/31.1) (the Site).

The new solar array will be constructed entirely on parcel 26/67.1 (187 Candlewood Mountain Road) located on the southern flank of Candlewood. The parcel has a total area of 163.5 acres, of which the proposed array will occupy approximately 73.0 acres.

The interconnection route will cross parcels 9/6 and 34/31.1.

The total amount of project area that will be cleared, graded, or otherwise temporarily disturbed as a result of this project is approximately 85 acres.

### **1.2 Site Description**

The solar PV array parcel itself is partially wooded, with approximately 15.9 acres of hay field/horse pasture. The installation of the array will occur on the flat areas of the array parcel, including the hay field/horse pasture areas. The solar PV array location will be accessed via an existing dirt road off of Candlewood Mountain Road. This road will be improved for use during construction and operation by installation of twelve (12) inches of graded gravel. A Site Locus Map is provided as Figure 1.

The route of the interconnection is planned to follow an existing cleared access road and utility corridors to the extent practicable across the adjacent Site parcels to the east.

The 26/67.1 parcel is adjacent to an old mine, which is located on the parcel immediately to the east. Adjacent parcels to the north, east and south are largely wooded and undeveloped. Rural residential properties occur along Candlewood Mountain Road to the southwest and west.

### **1.3 Project Description**

The purpose of the project is to construct a solar energy generating facility. The project is proposed to consist of approximately 78,000 Hyundai 360 watt (DC) panels and eight (8) inverters each with a combined output of 2.5 MW AC. The total system size is 27 MW DC, with a total rated nameplate AC generating capacity of 20 MWac. The panels will be installed on a screwed-in mounting system due to shallow rock conditions across the Site. The array will be completely surrounded by a 7-foot high chain-link fence. The inverters will consist of eight (8) pad-mounted 2.5 MW Eaton inverters which will convert the DC power generated by the panels to AC power that can be fed to the grid. The power will be fed from the inverters to transformers which will step up the voltage from 1500 Volts to 13,800 Volts, upon which the power will be routed through two (2) 13.8 kV conductors across the Site to the east (crossing parcels 9/6, and 34/31.1) to Route 7, whereupon they will connect with Eversource conductors on Route 7, located approximately 4,800 feet to the northeast from the location of the array.

## **2.0 SITE-SPECIFIC EROSION OR SEDIMENT CONTROL CONCERNS AND ISSUES**

Site-specific potential concerns and issues at this site consist of the following:

- ▶ Project Size
- ▶ Steep Slopes
- ▶ Soil Stockpile Areas

### **2.1 Project Size**

The proposed project will encompass approximately 85 acres of disturbed ground. Because the total amount of anticipated disturbance exceeds 5 acres, the project qualifies as a large construction site in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. Large construction sites have the potential to expose large amounts of surface soil during construction, making them vulnerable to erosion and downgradient sedimentation.

To address potential concerns due to the project size, the project has been designed to include 5 development phases, which will limit the amount of surface soils that are exposed at one time. Phasing is described in detail in Section 3.0 of this E&S Control Plan.

In addition to linear construction-phase Best Management Practices proposed for this project, sediment traps have been proposed below areas of non-stabilized, disturbed ground that will exceed 2 acres and drain to a common discharge point. No areas of non-stabilized, disturbed ground greater than 5 acres, which drain to a common point, are proposed.

### **2.2 Steep Slopes**

The project site is located on Candlewood Mountain. As such, the existing slopes within the limits of disturbance range from 3% to 25%. A Site-Specific Soils Report is included in Appendix A, which lists soil type by slope across the site. Under developed conditions, the slope in some areas will be reduced to accommodate panel-specific requirements, but the range of slopes will remain the same. Steep slope areas are shown on the drawings.

The strategy developed for this project to address potential concerns due to steep slopes includes creating diversions above steep slopes to direct stormwater run-on around steep slope areas. This is intended to reduce the amount of flow that would generate shear forces against exposed ground. Stockpile area and access roads have been designed to avoid steep slopes to the maximum extent practicable.

In addition, steep slope areas will be stabilized as soon as practicable following disturbance. Where stabilized with vegetative measures, erosion control blankets will be used on all slopes greater than 3H:1V (33%).

### **2.3 Soil Stockpile Area(s)**

The project involves earthmoving with heavy equipment. Soils will be generated during creation of the access road, clearing and grading of the array area, installation of utility poles, and potentially other ancillary work. Soil may be also imported to the site for use in grading activities and to provide suitable topsoil for vegetative stabilization. Generation and storage of soil represents a concern if soil stockpile areas are not managed properly.

To address potential concerns with soil storage at this site, stockpiles will be managed in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. Provisions include:

- ▶ Stockpile areas will be located away from natural drainage ways, wetlands, and steep slopes.
- ▶ Where stockpiles are located downgradient of long slopes, berms will be utilized to divert runoff around stockpiles areas.
- ▶ Stockpiles will be covered or stabilized when not in use, and will be surrounded on downgradient sides with linear sediment barriers to prevent migration of sediment.

### 3.0 PHASES OF DEVELOPMENT

This project qualifies as a large construction site in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. Construction will be phased as follows to minimize the site area that is actively being developed at any one time. Dates included are estimated timeframes for the start and completion of each phase.

- ▶ Phase I – Access Road Construction (November 2017)
- ▶ Phase II - Site Clearing, Stump Removal, and Limited Grading (December 2017 – January 2018)
- ▶ Phase III – Solar Array Installation (January 2018 – April 2018)
- ▶ Phase IV – Interconnection Route (March 2018 – April 2018)
- ▶ Phase V – Perimeter Fence Installation (April 2018)

Details for each phase are described below.

#### **Phase I – Access Road Construction**

This first phase will consist of improving the existing access trail, and extending it such that the entire site can be accessed for later phases. This phase also consists of the construction of support areas that will be utilized during this phase and later phases of the project. Phase I activities will be sequenced as follows:

1. Flag limits of disturbance for Phase I activities, as shown on the drawings.
2. Hold a pre-construction meeting.
3. Install the construction entrance along Candlewood Mountain Road, and prepare the temporary staging area.
4. Install perimeter sediment controls as shown on the drawings.
5. Cut above-ground vegetation, within the limits of disturbance for Phase I activities, as necessary for construction of access road and support area(s). Chip cleared vegetation and save for future use as mulch, or remove from the site. Avoid disturbing vegetation outside the limits of clearing.
6. Install sediment barriers and filters as shown on the drawings. Stabilize all drainage diversions and conveyances.
7. Remove stumps as necessary within the limits of disturbance for Phase I activities, and remove from the site.
8. Strip all topsoil within the road layout, and stockpile within the support area(s) for later use. Stockpiles shall be managed in accordance with this plan.
9. Perform cut/fill operations as necessary to construct the access road sub-base.
10. Place, grade, and compact aggregate material to complete the access road base, in accordance with the requirements of these drawings. Once the road base is completed in place, the access road surface will be considered stabilized.
11. Spread topsoil (as necessary) and perform final grading on access road shoulders.
12. Apply permanent seed to exposed areas according to the seeding instructions included on the drawings. Seeding shall be initiated within 72 hours of final grading in a given area. Apply erosion controls (e.g., straw, erosion control blankets) to all areas with slopes greater than 3:1.
13. Remove sediment barriers and filters that are not designated to remain for later phases, as shown on the drawings.

## **Phase II – Site Clearing, Stump Removal, and Limited Grading**

This phase will be broken up into several smaller sub-phases. Clearing, Stump Removal, and Limited Grading will be performed such that the total area of disturbed, exposed ground surface contributing stormwater runoff to a common point is restricted to 4.9 acres. Each area, 4.9 acres or less, which contributes stormwater runoff to a common point shall be referred to as a “Sub-Area”. The Contractor shall be responsible for survey layout and flagging of all Sub-Areas prior to ground disturbance activities associated with this phase. Phase II activities shall be sequenced as follows:

1. Identify Sub-Area(s) in which Phase II activities will be initiated next. Phase II activities shall be completed in upslope Sub-Areas first, then transition sequentially through downgradient Sub-Areas, so as to avoid directing runoff from exposed areas onto areas that have already been stabilized.
2. Mark the limits of the Sub-Area(s) in the field with high-visibility flagging, stakes, or a similar measure.
3. Hold a pre-construction meeting.
4. Install perimeter sediment barriers as shown on the drawings.
5. Construct temporary sediment traps and other best management practices as shown on the drawings.
6. Cut above-ground vegetation within the Sub-Area limits of clearing. Chip cleared vegetation and save for future use as mulch, or remove from the site. Avoid disturbing vegetation outside the limits of clearing.
7. Ensure an adequate supply of topsoil is present in the site stockpile area. Import topsoil to the stockpile area if necessary.
8. Remove stumps from within the array area as shown on the drawings, and remove from the site.
9. Perform limited grading as shown on the drawings, and spread topsoil as necessary to provide a suitable surface cover to support grass growth. This step may be initiated concurrent with stump removal to minimize the amount of time an areas remains exposed.
10. Perform final grading and apply temporary seed to exposed areas according to the seeding instructions as shown on the drawings. Seeding shall be initiated within 72 hours of final grading in a given area. Apply erosion controls (e.g., straw, erosion control blankets) to all areas with slopes greater than 3:1.
  - o Permanent seeding may be initiated in lieu of temporary seeding in areas that are not anticipated to be disturbed during later phases.
11. Once a Sub-Area has been stabilized (i.e., 80% established vegetative cover mature enough to control soil erosion and survive severe weather conditions), work at the next downgradient Sub-Area can begin, using the sequencing described above.
12. Erosion and sediment control structures shall be maintained per the drawing details and manufacturer’s instructions.
13. Temporary sediment traps shall be cleaned and removed or converted to permanent stormwater control devices, as shown on the drawings, once all upgradient areas have been stabilized following completion of Phase III.
14. Perimeter sediment barriers shall not be removed until all upgradient areas have been stabilized following completion of Phase III.

### **Phase III – Solar Array Installation**

This phase will be conducted on newly stabilized ground, following the establishment of vegetative cover initiated in Phase II.

1. Hold a pre-construction meeting.
2. Install conduit within trenches as shown on the drawings, minimizing the length of trench that remains exposed. Where possible, trenches shall be backfilled and stabilization initiated in the same work day.
3. Working on areas that have been sufficiently stabilized, install ground screws for solar arrays. Disturbance to previously stabilized areas should be minimized through the use of any or all of the following: low ground pressure equipment, common equipment travel lanes, or working in dry conditions.
4. Stabilize any soil cuttings removed during screw installation in upland areas.
5. Install equipment pads as shown on the plans.
6. Initiate permanent seeding for stabilization where required.

### **Phase IV – Interconnection Route**

This phase consists of installing the interconnection route between the array area and Route 7, as shown on the drawings. This phase may be conducted concurrently with Phases II and III.

1. Identify the limits of work for this phase, including any tree clearing or pruning necessary to accommodate the overhead lines, and mark them with high-visibility flagging.
2. Identify locations for proposed utility poles, and mark them with high-visibility flagging.
3. Hold a pre-construction meeting.
4. Cut above-ground vegetation within the limits of clearing. Chip cleared vegetation and save for future use as mulch, or remove from the site. Avoid disturbing vegetation outside the limits of clearing.
5. Leave stumps and below-ground vegetation in place.
6. Access utility pole locations from upland areas.
7. Crossing of wetland areas shall be as shown on the drawings, and shall be at the narrowest point within the limits of work. Swamp mats shall be utilized at all wetland area crossing to minimize soil disturbance and compaction.
8. Soils removed during installation of utility poles shall be placed in upland areas, upgradient of sedimentation controls, and shall be stabilized by vegetative or non-vegetative measures.
9. Restore disturbed areas upon completion, including restoration of wetland areas, if necessary, and application of permanent seed on exposed soils.

## **Phase V – Perimeter Fence Installation**

This phase consists of installing the perimeter fence around the array area and the access gate, as shown on the drawings. This phase may be conducted concurrently with Phases II, III, and/or IV.

1. Identify the limits of work for this phase, including the extents of fencing.
2. Mark obscure any locations with high-visibility flagging.
3. Hold a pre-construction meeting.
4. Install the fence posts as shown on the drawings.
5. Soils generated during installation of utility poles (if any) shall be placed in upland areas, upgradient of sedimentation controls, and shall be stabilized by vegetative or non-vegetative measures.

## **4.0 OTHER IMPORTANT INFORMATION**

As required by the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, this section provides or identifies the location of important information pertaining to this E&S Control Plan.

### **4.1 Design Criteria, Construction Details, and Maintenance Programs for Erosion and Sediment Control Measures**

This information is included as notes within the drawing details.

### **4.2 Sequence of Major Operations**

This information is detailed in Section 3.0 of the E&S Control Plan.

### **4.3 The Time Required for Major Operations**

This information is detailed in Section 3.0 of the E&S Control Plan.

### **4.4 Other Applicable Local, State, and Federal Permits**

Other applicable permits include:

- ▶ Connecticut Inland Wetlands and Watercourses Permit
- ▶ U.S. Army Corps of Engineers Section 404 Connecticut General Permit 6 – Utility Line Activities
- ▶ Connecticut General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ("Construction General Permit")
- ▶ Local Building Permit
- ▶ Electrical Interconnection Permit

### **4.5 Conservation Practices to be Used**

This information is included as notes on the drawings.

### **4.6 All Other Documents Considered Part of the E&S Control Plan**

The contractor shall adhere to the requirements of all documents appended to, and referenced within, this E&S Control Plan.

Figure

# Appendix A

Support Documents

# Appendix B

Erosion and Sediment Control Drawings